HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO COMMUNITY DEVELOPMENT DISTRICT

TOD OVERLAY PLAN
FINAL ~~DRAFT~~ ENVIRONMENTAL IMPACT STATEMENT

VOLUME ONE

June 10, 2015
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Kaka`ako Community Development District

TOD Overlay Plan
Final Environmental Impact Statement

Prepared for:
Hawaii Community Development Authority

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This Final Environmental Impact Statement and all ancillary documents were prepared under the signatory's direction or supervision, and the information submitted, to the best of the signatory's knowledge, fully addresses document content requirements as set forth in Chapter 343, Hawaii Revised Statutes, as amended, and Sections 11-200-17 and 11-200-18 of the Hawaii Administrative Rules.

Anthony J.H. Ching
Executive Director
Hawaii Community Development Authority

JUNE 10, 2015
Date

Accepting Authority: Governor, State of Hawai`i

Note to Reader

This final environmental impact statement includes the complete text of the draft EIS and all comment letters received by HCDA together with the agency's written responses, plus any changes/revisions to the text resulting from those letters.

Pursuant to the requirements of Section 11-200-18(D), Hawaii Administrative Rules, "The text of the final EIS which [sic] ***shall be written in a format which allows the reader to easily distinguish changes made to the text of the draft EIS."***

To comply with this requirement, all SUBSTANTIVE changes and/or revisions to the draft EIS are presented in bold-face, italicized and underlined text. Non-substantive revisions, e.g. correction of spelling errors, typos, renumbering of the Table of Contents etc., are NOT identified in this manner.

Kaka`ako Community Development District

TOD Overlay Plan
Final Environmental Impact Statement

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0.0 Executive Summary

0.1 Introduction

In 1976, the State Legislature designated Kaka`ako as a Community Development District (KCDD) under the jurisdiction of the Hawaii Community Development Authority (HCDA) - a body corporate and public instrument of the State of Hawai`i responsible for planning and revitalizing redevelopment areas. By direction of the State Legislature, Kaka`ako has been identified as a significantly underdeveloped and underutilized relative to its central location in urban Honolulu and HCDA has been tasked with planning for its redevelopment.

The 601.6-acre Kaka`ako Community Development District (KCDD) is situated within the Kona district of the Honolulu ahupua`a and is part of the Primary Urban Center. It is prominently located less than a mile east of Honolulu's central business district, and between the densely populated Punchbowl district to the north, Ala Moana Shopping Center and Waikiki to the east, and the Downtown area and Honolulu Harbor to the west. For planning purposes, it is divided into two parts, the Mauka Area and the Makai Area.

South King Street, Punchbowl Street, Ala Moana Boulevard and Piikoi Street bound the Mauka Area of the KCDD. It is envisioned as the residential, commercial and retail mixed-use neighborhood of the KCDD. Located makai of Ala Moana Boulevard, the Makai Area consists primarily of state and agency controlled land along the waterfront. It is bounded by Ala Moana Boulevard on the north, Ala Moana Regional Park on the east, Forest Avenue and the property line between Honolulu Harbor's Pier 2 and Pier 4 on the west, and the Pacific Ocean on the south. The Makai Area also includes a non-contiguous property called the Aloha Tower Special District (ATSD), a 3.4-acre parcel in Downtown owned by the Hawaiian Electric Company's (HECO) and occupied by HECO's downtown power plant. The ATSD is situated on the makai side of Ala Moana Boulevard and is bounded by Richard Street, Bishop Street, and Aloha Tower Drive. It is adjacent to Irwin Park, the Downtown Financial District and the Aloha Tower redevelopment area.

In 2012, the Honolulu City Council approved an alignment for the Honolulu Authority for Rapid Transportation (HART) elevated light-~~rail~~ ~~transit~~ ***metro*** system. The alignment identified three transit stations in within the Kaka`ako Community Development District: two in Kaka`ako Mauka (the Civic Center and Kaka`ako stations) and one at the Aloha Tower Special District (the Downtown station).

In response to this action, the HCDA retained consultants to prepare a plan to address the future opportunities presented by the introduction of an elevated light rail system or the expansion of other forms of public transit in Kaka`ako. The Draft

Transit Oriented Development Overlay Plan (hereinafter, "Draft TOD Overlay Plan") was published in May 2013 and distributed for public review (see Appendix A).

Subsequent to publication of the Draft TOD Overlay Plan, concerns were raised about excessive density in the KCDD and the effects of increased building heights upon existing residents. In response to these and other concerns, the 2014 State Legislature approved House Bill 1866 (House Draft 2, Senate Draft 1) that, among other things, limited building heights in the Mauka Area to 418 feet (400 feet plus appurtenant facilities such as elevator equipment), thereby reducing allowable building densities. On April 30, 2014, the Governor signed the bill into law as Act 61.

This Environmental Impact Statement (EIS) has been prepared to analyze the impacts of transit-oriented development in Kaka`ako. Development in the KCDD is governed by rules established separately for the Mauka Area and the Makai Area. For the purposes of this EIS, the "Future Baseline" condition is what would happen in the District if it were built-out in accordance with established rules and plans. The Proposed Action is a regulatory "overlay" on the Future Baseline Condition. Rather than change the fundamental character already established for the KCDD, it amends it or overlays it by offering a vision of how the district could respond to the opportunities presented by the introduction of an elevated light rail system in the Mauka Area[1]. The HART light ~~rail~~ ***metro*** system presents certain additional urban infill development opportunities with the KCDD and it is the impact of that additional development opportunity that is being disclosed in this EIS.

0.2 Summary of the Proposed Action and Alternatives

The Proposed Action is the implementation of transit-oriented development in the KCDD. It is intended to be an incentive based program that would provide development incentives for landowners: in exchange for density bonuses, landowners would be required to provide exemplary public benefits as part of their property redevelopment program.

For the purposes of this EIS, the Draft TOD Overlay Plan is identified as TOD Alternative A. The urban design scenario resulting from the adoption of Act 61 is identified in this EIS as TOD Alternative B. For the purposes of this EIS, no specific course of action is recommended. <u>The Proposed Action is defined as the implementation of either TOD Alternative A or TOD Alternative B</u>.

This EIS discloses the environmental, social, and economic impacts that will result from the implementation of either TOD Alternative A or TOD Alternative B. Once

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[1] The entire rail system was the subject of a separate EIS that was approved by the Federal Transit Administration on January 18, 2011. Thus, it is important to understand that the present EIS is not intended to evaluate the impacts of the ~~HART~~ light ~~rail~~ ***metro*** system alignment through the KCDD. That has already been done.

this EIS has been completed, the Draft TOD Overlay Plan may require revisions to accommodate the findings of the EIS. Ultimately, the HCDA will determine what course of action to take regarding transit-oriented development, that is to say: select TOD Alternative A and amend the Mauka Area rules to implement it[2], select TOD Alternative B and amend the Mauka Area rules to implement it, or elect to take no action to amend the Mauka Area rules.

For the purposes of this EIS, full build-out of the KCDD is targeted for 2035. Whether this actually happens will depend upon decisions made by private landowners and public agencies. However, it is necessary to identify a target year for analytical purposes of comparison.

Both TOD Alternative A and TOD Alternative B increase the overall quantity of housing in the KCDD as compared to the Future Baseline Condition and introduce new opportunities for area land uses such as a limited number of hotels (no more than three) and office/industrial buildings. Under the Proposed Action's policies, increases in land use capacity are only allowed if tethered to new community amenities and public realm enhancements, the substructure that supports urban lifestyles.

The Proposed Action asserts that strong land use and transit-planning partnerships can lay the groundwork to develop livable neighborhoods, improve public health, lower vehicle miles traveled (VMT), and reduce greenhouse gas (GHG) emissions, all while increasing sociability. By providing the opportunity for more growth, the private sector must respond by investing in the neighborhood amenity.

TOD Alternative A introduces significant height and tall residential towers to accommodate capacity increases. In this Alternative, building forms could include a cluster of 420-550' tall high-rise residential towers, as well as no more than three residential towers rising to 700' (one each in the Pauahi and Auahi neighborhood of the Mauka Area and one as part of the potential redevelopment of Blaisdell Center). The "as of right" development capacity in TOD Alternative A is 5.0 FAR (floor area ratio) <u>including all floor area associated with parking</u>. The maximum proposed FARs in TOD sites range from 7 FAR to a maximum of 10 FAR. With a potential for increased development capacity, this Alternative anticipates a redevelopment pattern that, depending on the size of the parcel, can accommodate multiple, inter-related buildings on a single development block.

TOD Alternative B explores how redevelopment might occur with a similar, but slightly reduced increase in capacity while maintaining the existing envelope of 418' height limitations, pursuant to Act 61. Alternative B was developed to maximize density within the District, taking into account the height limitation imposed by Act

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[2] However, so long as Act 61 remains in force, building heights in the Mauka Area cannot exceed 418 feet. If the HCDA Board elects to implement TOD Alternative A, it must still comply with the provisions of Act 61.

61 and without compromising desirable urban design and aesthetic character. The "as of right" capacity for TOD Alternative B is 5.0 FAR including all floor area associated with parking. The maximum proposed FARs in TOD sites range from 7 FAR to a maximum of 9 FAR.

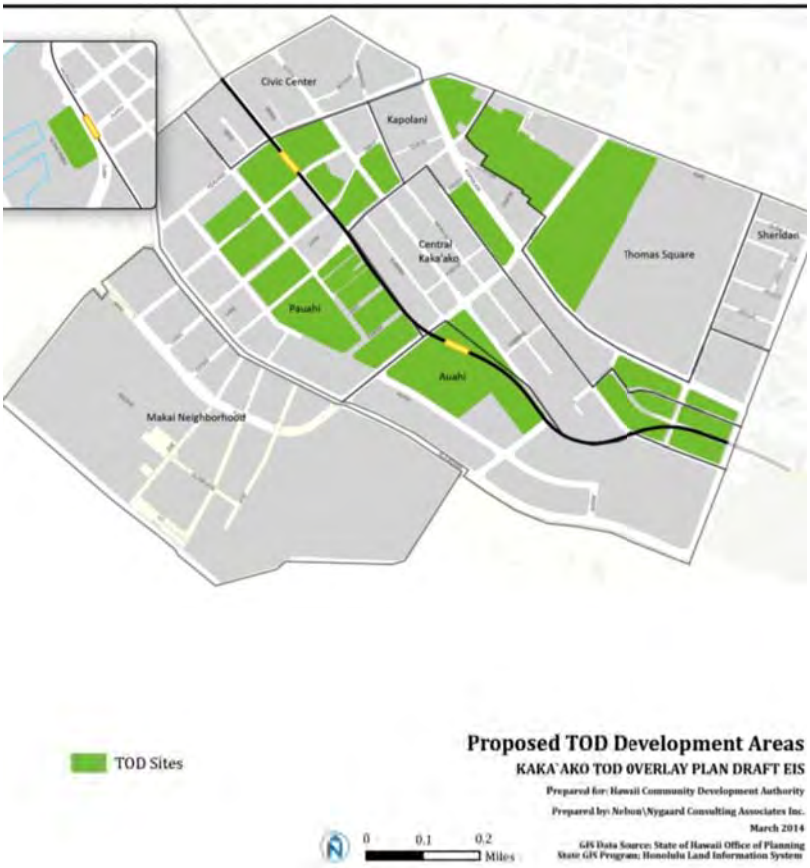
In both Alternatives, an incentive zoning method is proposed as a future implementation tool to achieve bonuses beyond the "as of right" development allowances. In an incentive zoning method, developers provide amenities (or payments allocated towards those amenities) in exchange for development rights. With more intensive use of property there are greater profits. As a trade-off for a greater intensity of use, the land developer is asked to contribute to enhanced public realm, cultural amenity and/or street connectivity. Adequate profitability is also required of private developers and their investors to ensure that rezoning efforts do not simply elevate land values. Incentive zoning programs must be carefully managed to ensure that the value of the community amenity is proportional and outweighs any adverse effects caused by additional building bulk. The specific parameters of the incentive zoning method will be addressed during TOD Overlay rule making by the HCDA.

Under the Proposed Action, the Mauka Area will continue its planned transformation towards a truly urban, high-rise, 24-hour, mixed-use neighborhood. Either TOD Alternative will increase overall development capacity only in selected neighborhoods within the Mauka Area (see Figure 2-1). No capacity or rule changes are proposed in the Makai Area, or for mature, and built-out existing neighborhoods (Sheridan, Civic Center and portions of Central Kaka`ako) outside of the TOD Overlay development area.

In most areas, it is assumed that increased capacity in TOD Alternatives A and B come with public infrastructure improvements that will support healthy neighborhoods including:

- Safe bicycle lanes and greatly enhanced bicycle accessibility;
- Improvements to both pedestrian and vehicular connections in the district;
- Additional funding for parks and public realm at the ground level;
- Midblock crossing at alleys and ways to enhance connections between the TOD Overlay plan area and other parts of the district;
- The screening and structuring of parking;
- The application of a broad range of transportation demand management to reduce the amount of valuable land consumed by parking. (TDM programs are typically financial incentives to encourage commuters to travel by modes other than driving, including subsidized transit passes; these tools provide alternatives to single occupancy driving.);
- Wide sidewalks and sidewalk amenities;
- Street trees and urban greening;

Figure ES-1: Proposed TOD Development Areas



Note: The HCDA identifies "neighborhoods" in the KCDD for planning purposes. The Thomas Square neighborhood identified above <u>does not</u> include Thomas Square Park, which lies just outside the KCDD on the mauka side of King Street.

- An incentive program will correlate the allocation of multi-purpose open spaces for additional height and capacity. Open spaces may be allocated on site, for example on green roofs as well as contribute to a dedicated in-lieu program to further develop planned parks and open spaces. This encourages private investment in open space and recreational facilities.
- Both the Alternatives explore the ability to allocate a large park space located on a redeveloped Blaisdell Center Site, and a redeveloped HECO site, both in the Thomas Square District.
- The Proposed Action guides HCDA in the integration of a new transit plaza associated with the Civic Center Station.
- Green connections and mid-block paths are associated with redevelopment of consolidated parcels under both Alternatives.
- The Proposed Action directs HCDA to tie a minimum of fee ($ per SF) or per FAR to public active space. A tiered program may be proposed for each neighborhood prioritizing needed amenity.

0.3 Use of Public Funds or Lands for the Proposed Action

The Proposed Action is a planning tool intended to encourage transit-oriented development in the KCDD. To that end, public funds will be used to implement the plan. These funds take the form of a portion of the operational costs of the HCDA; the governmental authority charged with implementing and enforcing development regulations in the KCDD.

As the KCDD contains publicly owned streets, sidewalks and park space, public funds will be used for on-going maintenance of these facilities. Improvements to these facilities envisioned in the Proposed Action may be implemented at the discretion of the overseeing agency. For example, the roadways within the KCDD fall under the jurisdiction of the City and County of Honolulu. Implementation of a Complete Streets program in the KCDD will require funding by the City.

Certain properties within the KCDD are owned by government agencies. Public funds may be used to develop or to facilitate development of these properties.

0.4 Summary of Beneficial and Adverse Impacts

Implementation of the Proposed Action will cause potential short-term and long-term impacts to the natural and built environment. The potential impacts are summarized below:

Population: The following table summarizes full-build out in 2035 under the existing rules (Future Baseline Condition) and the two TOD alternatives.

	Residential Units	Full-Time Residential Population	Average De Facto Population(1)	Total Operational Jobs at Build-Out(2)	Office Jobs Only	Cumulative Construction Jobs from Full Build-Out(3)
Future Baseline	21,146	33,466	33,844	51,207	37,186	55,612
TOD Alt. B	26,588	42,477	44,465	43,651	29,474	68,994
Impact (difference)	*5,443*	*9,011*	*10,621*	*-7,555*	*-7,712*	*13,382*
TOD Alt. A	28,968	46,181	48,223	45,157	30,397	75,970
Impact (difference)	*7,822*	*12,715*	*14,359*	*-6,050*	*-6,789*	*20,359*

(1) "De Facto" Population = Full-Time residents minus those temporarily away + Part-Time residents and (for TOD Alternatives A and B) Hotel Guests.
(2) Total Full- and Part-Time jobs, all shifts and days of the week.
(3) In Job-Years (both Full- and Part-Time); includes some "soft-cost" (architect/engineer) jobs; includes construction of additional public infrastructure and government facilities attributable to each scenario.
Source: EIS Appendix G (Socio-Economic Analysis)

TOD Alternative A would add approximately 12,715 people to the full-time residential population over the Future Baseline Condition, 3,704 more than TOD Alternative B. However, this growth actually represents a population shift. It is anticipated that people moving to Kaka`ako will be doing so from elsewhere on the

island. Both TOD Alternatives are consistent with State and City policies to concentrate much of the island's future growth in Kaka`ako or similar high-density locations.

Employment: As evidenced in the above table, both TOD Alternatives result in a reduction of office buildings in the KCDD when compared to the Future Baseline Condition. The alternatives focus on increasing the availability of new residential opportunities. TOD Alternative A would provide 45,157 operational jobs at build-out, approximately 6,000 less than the Future Baseline Condition. The greater reduction in density attributable to TOD Alternative B would result in a greater reduction in office space, with 7,555 fewer jobs than forecasted for the Future Baseline Condition at full build-out.

Construction: Full build-out of TOD Alternative A would create 75,970 construction jobs, 20,359 more than those forecasted for the Future Baseline Condition. Implementation of TOD Alternative B would generate less construction employment, but still more than 13,000 jobs over the Future Baseline Condition. Short-term construction impacts will include noise from the operation of construction equipment, slow moving vehicles on the roads to project sites, temporary coning or closure of traffic lanes to divert traffic from construction in roadways, and the degradation of air quality.

Infrastructure: Redevelopment of a mature urban area in the heart of greater Honolulu will impact infrastructure systems that serve the entire region.

- Water – At full build-out, TOD Alternative A will increase demand by approximately 1.11 million gallons per day (MGD) over the Future Baseline Condition. TOD Alternative B would increase demand by approximately 800,000 gallons per day. Several upgrades to the existing water service system have already been identified as part of the Future Baseline Condition, but have not yet been implemented. Given on-going and planned Board of Water Supply and Ward redevelopment projects in the area, the existing system is generally capable of meeting peak hour domestic consumption demand. However, approximately 37,600 linear feet of existing 6- and 8- inch diameter water mains need to be upgraded to 12-inch diameter mains to accommodate fire flow requirements. No additional regional improvements are required.
- Wastewater – At full build-out, TOD Alternative A would increase daily wastewater flow rates by 1.2 million gallons over the Future Baseline Condition. TOD Alternative B would increase wastewater flow by 900,000 gallons per day. Several capital improvement projects have been budgeted by the City to improve trunk lines, rehabilitate sewer lines, and add a new pump station in the area. In addition, the City is presently studying preliminary alignments for new Relief Sewer Corridors that would address sewer flow outside of the KCDD, and in so doing, help reduce demand on existing

collection lines in the KCDD. In addition to these projects, the Proposed Action would require the replacement of portions of sewer lines within KCDD:

- 480 LF of 10" sewer on Halekauwila Street between South and Keawe Streets with a 12" sewer;
- 310 LF of 8" sewer on Keawe Street makai of Halekauwila Street with a 12" sewer;
- 250 LF of 6" sewer on Ilaniwai between Kamani Street and Ward Avenue with an 8" sewer; and
- Upsize 305 LF of planned sewer in Pohukaina Street between Ahui Street and Ward Avenue from 12" to 18" diameter to 24" sewer in Ward Avenue.

Even with these projects and improvements in place, a number of existing branching sewer mains in the District would remain surcharged ***(excessively burdened)***. However, the existing system, as modified by the identified improvements, will be capable of meeting peak flow requirements. Despite the surcharged conditions, no spills are anticipated.

- Solid Waste – No modifications to the solid waste disposal program within the Mauka Area are proposed. Expansion of private contractor provided collection services might be required to meet future increased demands.
- Drainage – The existing drainage system is inadequate to accommodate and dispose of design storm rainfall runoff quantities in both the existing and future conditions. Several system improvements have been identified to address existing deficiencies, including pavement resurfacing and new drain inlets and/or catch basins, but HCDA presently has no current schedule for their design or construction. However, it is noted that since most of the future improvements are anticipated to be vertical development, additional rainfall runoff, due to development, is anticipated to be negligible; and as such, surface water ponding concerns and existing drainage system inadequacies would not be exacerbated. In other words, while the existing drainage system has deficiencies, the Proposed Action will not exacerbate them.
- Electrical – At full build-out, TOD Alternative A would increase demand for electricity an estimated 1.2 million volt-amperes over the Future Baseline Condition. TOD Alternative B would increase demand an estimated 400,000 volt-amperes. It appears that, in general, the existing underground duct systems within the Mauka Area have sufficient space to accommodate the proposed load growth with the caveat that, in some areas, new infrastructure would need to be constructed to extend the 25 kV distribution system. Additionally, development in areas served by existing overhead lines may be limited until an underground duct system is installed in these areas. In the worst case (TOD Alternative A), it appears that within 9 years, HECO would apparently either need to serve the additional loads from the Iwilei and Kewalo Substations, by adding another substation transformer in both substations, or need to construct and energize its proposed Cooke Street

Substation site, or both. Beyond 9 years of development, HECO would likely need to secure an additional substation site. The need for this site would be evaluated by HECO based on actual load growth experienced during the 23-year build-out.

Traffic: The increase of residents, visitors, and workers in the Mauka Area will exacerbate traffic conditions. Slower vehicular travel times are anticipated. However, there are no intersections within the KCDD that deteriorate from Level of Service (LOS) E or better under the Future Baseline Condition to LOS F under the Proposed Action. That said, three intersections along Ala Moana Boulevard (at South Street, Cooke Street, and Ward Avenue) and two on Ward Avenue (at Queen Street and at Kapiolani Boulevard), which are forecasted to operate at LOS F under the Future Baseline Condition, would also operate at LOS F under the Proposed Action.

Traffic delay under the Proposed Action is not anticipated to result in a level of delay to buses that would require additional buses or operating costs compared to the Future Baseline condition. Therefore, there is no significant transit operations impact resulting from the Proposed Action.

The ~~fixed guideway~~ ***metro*** transit system ~~– HART -~~ is presently under construction. ~~HART~~ ***The system*** will provide faster, more reliable transit along the corridor where many transit vehicles must operate in mixed-flow traffic, and serve as an attractive alternative to the private automobile. The project would strengthen the connection between Kapolei, Downtown Honolulu and Kaka`ako, UH Manoa, and Waikiki.

A major goal of the Proposed Action is to encourage transit oriented development. The Proposed Action is intended to facilitate and encourage transit use by placing relatively high-density development adjacent to or within easy walking access of major transit facilities such as stations on the fixed guideway system or transfer points between bus lines. TOD projects also typically encourage the use of non-motorized modes of travel, including pedestrian and bicycle travel, and discourage the use of private automobiles.

The Proposed Action will generate the following net increases in trips in comparison to the Future Baseline Condition:

- Walk/bike trips: up to 29 percent increase over the Future Baseline Condition
- Transit trips: up to 19 percent increase over the Future Baseline Condition
- Motor vehicle trips: up to 16 percent increase over the Future Baseline Condition based on daily trips, while the increase in peak-hour motor vehicle trips would be smaller:
    - up to 7 percent increase over the Future Baseline Condition during the AM Peak Hour

- up to 9 percent increase over the Future Baseline Condition during the PM Peak Hour

The Proposed Action will result in up to a three-fold increase in daily bicycle volumes with no commensurate or appropriate increase in bicycle capacity. A similar increase will occur in daily pedestrian crossings at major pedestrian corridors.

Social Impacts: The following outlines some of the fundamental impacts/benefits resulting from the implementation of the Proposed Action.

- Improved public health – Transit rich environments, such as Kaka`ako, will benefit not only from important statistical reductions in traffic injuries or fatalities, but also reduced air pollution ***during peak travel hours*** and increased levels of daily physical exercise, which has broad implications for public health, and reduced medical costs. Studies show that obesity rates tend to fall sharply with increased walking, cycling and transit use.
- Alternative Travel Options – The Proposed Action not only provides better future access to the ~~HART rapid~~ ***light metro*** transit project to improve regional mobility to non-drivers via the two major stations within the District, but it also further builds upon the current Ward Centers and Kamehameha Schools Master Plans. Both of these Plans are dedicated to introducing more street level activity and have been engaged by HCDA to allocate space for new local circulation options for vehicles and pedestrians. There is also a clear household and community wide cost-savings attributed to transit use. Families that are able to own less vehicles per household can spend those dollars elsewhere. Furthermore, walking and cycling are the most sustainable transport modes, and are affordable by virtually everyone.
- Improved Access to Housing – The primary goal of the Proposed Action is to encourage more housing in an accessible location proximate to existing job centers. The historical trend of high demand for residential housing on O`ahu coupled with strong economic conditions could conceivably result in housing development meeting expectations in the 2035 timeframe, especially if infrastructure investments identified in the Proposed Action are prioritized to support these intensive levels of development. Within the District, proposals for more intensive land uses with taller buildings will provide a greater number of total units than what is allowable under the Future Baseline Condition. Under the current HCDA Reserved Housing Policy, 20% of all new units will be built as workforce housing. In order for landowners and/or developers to achieve density incentives, workforce housing may even take on greater percentages in some areas. The Proposed Action also continues HCDA's strategy to preserve characteristics of neighborhoods with existing resident populations or historic and institutional uses, particularly in the Sheridan and Civic Center neighborhoods (neither of these

neighborhoods are eligible for participation in the TOD Overlay Plan's supplementary height and density programs).

- Improved Parking Options - As areas urbanize, with more people and uses competing for access to the same destinations, parking becomes highly contested. The availability and supply of parking is one of the strongest indicators of a population's likely transit mode share, with free and readily available parking strongly correlated with reduced transit ridership. Applying measures to manage parking efficiently achieves the broader planning objectives of supporting more compact development, encouraging transit use, and increasing development affordability. The Proposed Action studies where and how to manage parking as a public resource, with a particular emphasis on both long-term "park once" systems (residential or employee parking) and short-term (visitors and shopping) parking needs. When implemented, the Proposed Action will offer a menu of different types of on-street parking treatments, provide a basis for market-based pricing of parking, explore context-sensitive parking requirements for new land uses, and provide progressive measures to introduce options for shared parking resources between uses. The Proposed Action also incorporates policies to encourage long term parking management strategies at the District scale to provide more efficient utilization.
- Reserved Housing – High-rise development provides a better opportunity for the provision of reserved housing than single-family unit residential development because the land and infrastructure costs for high-rise development are distributed among a greater number of units. In addition, the sale of high-priced units in a building can help offset (subsidize) the cost of the units reserved for lower income families. The cost of developing single-family units makes it difficult to achieve affordability without government subsidy. While there are successful government programs, it is clear that they have not met the demand. The Proposed Action is intended to increase the number of reserved housing units in three fundamental ways. First, by adhering to the HCDA 20% Rule (20% percent of all new units constructed must be reserved for families/individuals who qualify under federal affordability guidelines), the increase in density envisioned in the Proposed Action will result in a greater number of units coming to market, and a proportionate increase in the number of those that reserved. Second, the Proposed Action includes height and density bonuses that are intended to encourage developers to participate in the provision of reserved units. Simply put, a developer would be allowed to increase the density of a structure in exchange for what are described as "exemplary public benefits". The result is a negotiated process whereby the HCDA can bargain for the increased provision of reserved housing. Third, by relaxing the parking standards per dwelling unit, by untethering parking from residential units in deference to the District's proximity to rail and employment centers, and by increasing building heights (in the case of TOD Alternative A), the HCDA is attempting to bring down the development cost of units, which would result

in their increased affordability. If it is possible to include more units in a building because fewer floors must be dedicated to onsite parking and more floors are allowed, then arguably the cost of constructing the building can be distributed among a greater number of units, thereby lowering the cost of each.

- Parks and Open Space – Neither the HCDA (the primary provider of parks and recreational facilities in Kakaʻako) nor the City's Department of Parks and Recreation currently plans to construct additional parks in or near Kakaʻako, suggesting that impacts will be confined to existing parks in the region.

Cultural Resources: Several Hawaiian cultural resources, in the form of historic structures are located in the District. While, these buildings are not directly threatened by redevelopment, there is a high probability that cultural recourses in the form of human remains (*iwi*) will be inadvertently found during excavation activities associated with new development. Implementation of the Proposed Action could potentially impact these cultural resources. It could also impact the several contemporary cultural resources identified in the District including cultural learning facilities; public parks and grounds, memorials and commemorations; religious and spiritual gathering places; and public art installation and entertainment centers.

Visual Resources: It is anticipated that the build-out of the Mauka Area under the Future Baseline Condition or either TOD Alternative will impair the existing mauka-makai views. As projects in the Mauka Area develop according to existing zoning, views of, and within the KCDD are expected to change significantly. The greatest impacts will be seen with the higher intensity growth in number and frequency of high-rise buildings under the TOD Alternative A. TOD Alternative B would result in impacts greater than the Future Baseline Condition, but less than the TOD Alternative A. Under either Alternative, panoramic views from identified viewpoints, and existing high-rise or low-rise buildings will be curtailed, but existing view corridors along major mauka-makai streets will be preserved. Buildings fronting Ala Moana Boulevard and situated in the Makai Area will have reduced views of the Ko`olau Range, while buildings along Kapiolani and in the Thomas Square Neighborhood will have reduced views of the ocean. This is typical of an urban environment where external views of landscapes are slowly exchanged for framed views and new architectural features.

Government Revenue: State revenues are projected to be $14.8 million more than costs annually for TOD Alternative A and $14.1 million annually for TOD Alternative B. If municipal revenues are limited to General Excise Tax and property taxes, the difference between revenues and costs is a positive $0.08 million annually for TOD Alternative A and a negative $0.41 million annually for TOD Alternative B. However, if legislature-imposed caps on the Transit Accommodations Tax are eliminated, TOD Alternative A would generate approximately $1.2 million annually and TOD Alternative B would generate approximately $0.7 million annually. Therefore,

Proposed Action is unlikely to have any real perceptible impact on annual County operating budgets.

Secondary and Cumulative Impacts: Introducing transit-oriented development as an overlay to the redevelopment of Kaka`ako already anticipated under the current Mauka Area rules (the Future Baseline Condition), is likely to affect the residents and visitors to nearby areas such as downtown Honolulu, the Ala Moana/Sheridan district, Waikiki, and other areas of the City and County of Honolulu. Implementation of TOD, when added to other adopted and proposed projects of a similar nature (such as other TOD projects envisioned by the City along the transit line corridor) may have a significant affect on a regional scale, and at an islandwide scale.

Kaka`ako is situated in the Primary Urban Center, which is intended to accommodate a substantial portion of O`ahu's population growth over the next 25 to 30 years. The Proposed Action will have long-term effects on the decisions by O`ahu residents about where to live, work, and play, which will, in turn lead to a redistribution of population.

Implementation of the Proposed Action will also provide new employment, residential, commercial, and light-industrial opportunities that together sustain the redevelopment activity that was initiated by the implementation of the Mauka Area Plan in 2011.

0.5 Summary of Recommended Mitigation Measures

Following is a summary of the major measures recommended to mitigate the impacts associated with implementing the Proposed Action:

Population: The effects of increased population in the District will be mitigated through the implementation of a palette of objectives and policies to improve quality of life. These are best summarized by the "6-D Objectives" of the Proposed Action:

- Objective D1: Destinations – Coordinate Land Use and Transportation;
- Objective D2: Distance – Create a well-connected street network using Complete Streets principles;
- Objective D3: Design – Create places for people;
- Objective D4: Density – Concentrate and intensify activities near frequent transit;
- Objective D5: Diversity – Encourage a mix of uses; and
- Objective D6: Demand Management – Encourage the "auto trip not taken" through a systems management approach.

Construction: Implementation of Best Management Practices for each new construction projects in the District will mitigate the short-term impacts of construction activities, including impacts on traffic, noise quality, and air quality.

Infrastructure: Several water main, wastewater collection line, and drainage projects have been identified to improve the distribution of water in the district, the collection of wastewater, and storm water catchment. These include:

- Upgrading existing -6 and -8 inch diameter water mains to accommodate peak hour domestic water consumption demand requirements and 4,000-gallon per minute fire flow requirements;
- Replace 480 LF of 10" sewer on Pohukaina Street between South and Keawe Streets with a 12" sewer;
- Upsize 305 LF of HHG's planned sewer in Pohukaina Street between Ahui Street and Ward Avenue from 12" to 18" diameter;
- Replace 480 LF of 10" sewer on Halekauwila Street between South and Keawe Streets with a 12" sewer;
- Replace 310 LF of 8" sewer on Keawe Street makai of Halekauwila Street with a 12" sewer;
- Replace 250 LF of 6" sewer on Ilaniwai between Kamani Street and Ward Avenue with an 8" sewer;
- Upsize 305 LF of HHG's planned sewer in Pohukaina Street between Ahui Street and Ward Avenue from 12" to 18" diameter to 24" sewer in Ward Avenue; and
- Require new developments to retain storm water runoff on-site through the use of infiltration or rain-harvesting methods, or allow discharge to run off through an appropriate bio filter such as a rain garden, green roof, or tree box filters.

Traffic: Implementation of the Proposed Action, while generating significant traffic impacts, it also intended to mitigate them by encouraging and facilitating improved bicycle, pedestrian, and transit access within the KCDD. Specific traffic mitigations include:

- Increase the allocation of green signal time per cycle at the Ala Moana Blvd/South Street and Ala Moana Blvd/Cooke Street intersections;
- Restripe north/south approaches at Ala Moana Blvd/Ward Ave to eliminate split signal phases.
- Reduce the length of the east-leg pedestrian crossing at Ala Moana Blvd/Ward Ave;
- Provide restriped and bollard-protected bicycle lanes on Punchbowl Street, South Street, and Cooke Street;
- Install bicycle lanes on Ward Avenue;
- Provide restriped bicycle lands on Pensacola Street/Piikoi Street and study potential two-way conversion with 3 lanes and bicycle lanes;

- Construct a cycle track or strip bicycle lanes on Halekauwila Street, contingent with the final design and location of the ~~HART~~ ***light metro*** guideway columns;
- Construct curb extensions at all intersections with on-street parking and that have 24' curb-to-curb walk distances of minor streets or 26' curb-to-curb walk distances of major streets; Reduce intersection skew; Tighten intersection geometry; Construct pedestrian refuge islands (Each mitigation measure requires further study);
- Require redevelopment setbacks that ensure a minimum 15' pedestrian realm (sidewalk plus buffer including furniture zone and landscaping) regardless of existing pedestrian realm width. (If the existing pedestrian realm is greater than 15', then there is no significant impact.);
- Reconstruct streets in Central Kaka`ako as shared industrial streets while maintaining delivery and parking storage functions;
- Reduce Ala Moana Boulevard signal cycle lengths to 120 seconds and couple with other signal optimization features; this will create more lane capacity (from 800vph to 1200vph); and
- Construct makai side shared use path on Ala Moana Boulevard.

Social: While much of the Proposed Action will improve quality of life in the KCDD as discussed in the Impacts section above, additional actions can be taken by HCDA to mitigate impacts:

- Revise current Reserve Housing program to increase the amount of affordable housing provided in the District;
- Develop a Parks Master Plan that would thoroughly study needs and best ways to meet them.

Cultural: To mitigate impacts on cultural resources in the event they are uncovered during property excavation or ground disturbance, HCDA will continue to require full compliance with procedures established by the Oahu Island Burial Council and the State Historic Preservation Division of the Department of Land and Natural Resources. HCDA will also ensure that parking and accessibility to historic structures is not reduced as the result of new developments in surrounding areas. With regard to contemporary cultural facilities that exist in the District, HCDA will encourage landowners/lessors to offer adjusted rent spaces to help preserve those uses and activities in the District.

Visual Resources: The preservation of visual resources can be best accomplished during implementation of the Proposed Action by ensuring that the development rules to be enacted include provisions such as:

- Present prototypical development lots, with preferred site design for staggered of offset towers;

- Encourage staggered building heights (tower configurations should provide skyline diversity);
- Provide examples of appropriate building tops;
- Revise standard (ch 15-217-55 (4) for view corridor streets in the TOD Overlay Area to regularize the setback allowed in the Master Plan areas, at 75' above the Street Element;
- Revise rule 15-217-54 (c) that requires an increased setback by three feet for every ten feet of building height. These rules are in conflict with building types as proposed and would negate the ability for large parcels to place multiple buildings on a development parcel by reducing flexibility and pushing development to one side of the development parcel.
- Revise Mauka Area Rule designating 25% of tower "void" space to be located at the street frontage.
- Revise Mauka Area Rule designating 65% of tower to be located on street frontage;
- Encourage developments to provide aesthetic treatments on rooftops;
- Create a green-roof policy; and
- For *Iconic Towers* in TOD Alternative A (if implemented), include a provision for the public to access the view by providing public lobby, restaurant, or other public space on top floors.

0.6 Unresolved Issues

Regional Infrastructure: The construction of a region-serving Relief Sewer Corridor to relieve wastewater demands in Waikiki and elsewhere in Honolulu is presently being evaluated by the City's Environmental Services Department. The decision to construct the line, and if so, where will impact wastewater collection line capacities in Kaka`ako. Some existing sewer lines in Kaka`ako are surcharged by wastewater generated elsewhere. Construction of the relief sewer line would resolve capacity issues and might preclude the need for additional smaller-scale sewer improvements in the District. The relief sewer line project has been under consideration for several years and the outcome of decision-making is beyond the control of HCDA. The matter will remain unresolved until the City completes its planning efforts, and the timing of that effort remains unknown.

City's 2040 Population Projections: The City and County of Honolulu's Department of Planning and Permitting periodically forecasts population on the island of O`ahu for purposes of long-range planning. For the past several years, DPP has utilized population projections with a planning horizon of 2035. The Proposed Action assumes the same planning horizon as its hypothetical build-out date. In 2013, the City advised HCDA that it would soon begin updating its current population forecast to 2040. As recently as October 2014, in a follow-up inquiry to the City as to the status of its efforts, we were advised that the City has developed

interim projections to 2040, which have been used by the City for some planning purposes. However, we were also advised that *official* projections are still on hold due to technical issues that must be resolved. The City is targeting June 2015 as a possible release date for the *official* projections. The matter will remain unresolved until such time that the DPP officially releases the 2040 forecast.

The Ultimate Timing and Extent of Community Amenities: As the majority of property in the KCDD is privately owned, individual properties will undergo redevelopment based on the preferences and needs of the respective property owners. The existing Mauka Area rules define the maximum allowable scope of redevelopment of any particular property. While the TOD Overlay Plan, when implemented, will change that scope, it is an incentive based program and it will remain up to the property owner to determine how much density to pursue should they determine that redevelopment is in their interest. Thus, the scope of potential community amenities are tethered to the land use capacity of a particular property, as defined by the property owner in a redevelopment proposal. For example, Kamehameha Schools has elected to focus the redevelopment of some of its properties at a density (including building height) that is less than what is allowed under existing rules. The ultimate timing of redevelopment of any given property is therefore unknown to the HCDA until the property owner presents specific plans to the agency for approval. Additionally, the extent of community amenities that may arise from the redevelopment of any particular property will ultimately be negotiated between the property owner and the agency and will be directly proportional to the density of the redevelopment proposed: the pursuit of maximum allowable density by a property owner will likely result in greater public amenities than a more modest development proposal. Thus, the ultimate provision of community amenities is unknown until such time that a property's redevelopment plan is formulated, presented to HCDA for review and approval, and the nature and extent of community amenities are successfully negotiated.

Office of Hawaiian Affairs (OHA) Master Plan: In 2014, OHA announced that it would prepare a master plan to determine the future uses and development timing for its property holdings in the Makai Area. The outcome of its master planning efforts will have broad implications on matters concerning general urban density, infrastructure capacity, and views. The scope and timing of the OHA master plan will remain unresolved until such time that the agency selects a consultant, establishes a deadline for the planning effort and its decision-making.

Completion of HCDA Parks Master Plan: HCDA has determined the need to prepare a master plan for the provision of public and private parklands and recreational and/or passive open space in the KCDD. The timing for the preparation, review, and approval of the plan is presently unresolved. The outcome of this process cannot be known until the effort is funded by HCDA, a consultant is selected, and a deadline for completion is established.

Implementation of the Proposed Action: The Proposed Action is described throughout this document as being "incentive based", meaning that to achieve the HCDA's desired outcome of more affordable housing, pedestrian-friendlier streets, and less emphasis on the automobile, developers will be offered an incentive of greater density and/or relaxed parking standards, etc. How this incentive based program will be implemented is unresolved at this point in time. The process for implementing TOD requires the publication of a Draft TOD Overlay Plan, which was done in May 2013, followed by the preparation of an EIS to evaluate its impacts (which is now underway). Once the EIS effort is concluded, the Draft TOD Overlay Plan must be finalized and then approved by the HCDA. After that occurs, final rules for implementing TOD must be prepared by the HCDA and presented to the public for comment, before being reviewed by the HCDA for final approval. The rules are the mechanism by which the incentive based program will be implemented. The exact form and content of those rules cannot be finalized at this point in time, which leaves the matter unresolved. The matter will be resolved once the rules are finalized, presented to the public for comment, and ultimately reviewed by the HCDA for approval. However, Appendix B of the Draft TOD Overlay Plan (presented in Volume Two of the EIS as Appendix A) presents a preliminary idea of the scope and content of the proposed rules for TOD.

0.7 Compatibility with Land Use Plans and Policies

The Proposed Action is consistent with prevailing City and State land use plans and policies.

0.8 Required Permits and Approvals

The following permits and/or approvals will be required for individual development projects:

Subdivision Approval (if applicable)	Department of Planning and Permitting
Building/Grading Permits	Department of Planning and Permitting
Installation of Power Lines & Substations	State Public Utilities Commission
National Pollutant Discharge Elimination System (NPDES) Permit	State Department of Health
Noise Permit	State Department of Health
Modification of Highway Access Points	State Department of Transportation
Work Within the State Highway ROW	State Department of Transportation
Dewatering/Stockpiling	Department of Planning and Permitting
Trenching	Department of Planning and Permitting
Street Usage Permit	***Department of Transportation Services***

Development Permit	Hawaii Community Development Authority
FAA Form 7460-1	***Federal Aviation Administration***

GLOSSARY OF TERMS, ABBREVIATIONS, AND ACRONYMS

AADCCH	African American Diversity Cultural Center of Hawai`i.
AAQS	Ambient Air Quality Standards.
ACE	United States Army Corps of Engineers (also referred to as 'the Corps' or 'COE').
ACHP	Advisory Council on Historic Preservation.
AIS	Archaeological Inventory Survey.
AMI	Average median income.
AMSD	Ala Moana Special District: a corridor along the Mauka side of Ala Moana Boulevard within the Kaka`ako Community Development District with restricted height limits.
ATSD	Aloha Tower Special District.
BCH	Belt Collins Hawaii.
Blvd.	Boulevard.
BMP	Best Management Practices.
BPBM	Bernice Pauahi Bishop Museum.
BTP	Burial Treatment Plan.
BWS	Board of Water Supply, City and County of Honolulu.
CCH	City and County of Honolulu.
CDP	Census Designated Place.
CCTV	Closed circuit television.
Cfs	Cubic feet per second.
Ch	Chapter.
Chapter 343	Chapter of the Hawai`i Revised Statutes that addresses environmental assessment.
CIA	Cultural Impact Assessment.
Cm	Centimeter.
CT	Census Tract.
dBA	A-weighted decibel, a unit of sound measurement.
DBEDT	Hawai'i State Department of Business, Economic Development and Tourism.
DLNR	Hawai`i State Department of Land and Natural Resources.
DNL	Day-night average sound level, also referred to as Ldn.
DOD	United States Department of Defense.
DOE	Hawai`i State Department of Education.
DOH	Hawai`i State Department of Health.
DOT	Hawai`i State Department of Transportation.
DPP	City and County of Honolulu Department of Planning and Permitting.
DPP-CEB	City and County of Honolulu Department of Planning and Permitting – Civil Engineering Branch.
DTS	City and County of Honolulu Department of Transit Services.

EIS	Environmental Impact Statement.
EISPN	Environmental Impact Statement Preparation Notice.
ENV	City and County of Honolulu Department of Environmental Services.
ENV-RD	City and County of Honolulu Department of Environmental Services – Refuse Division.
ESA	Endangered Species Act.
ESDU	Equivalent single-family dwelling unit.
˚F	Degrees Fahrenheit.
FAA	Federal Aviation Administration.
FAR	Floor Area Ratio.
FHA	Federal Housing Administration.
FEMA	Federal Emergency Management Agency.
FIRM	Flood Insurance Rate Map.
Floorplate	The physical area occupied by a floor in a high-rise tower.
GET	General Excise Tax.
GHG	Green House Gases.
GIS	Global Information System.
GPD	Gallons per day.
GPM	Gallons per minute.
GPS	Global Positioning System.
GST	Gravity sewer tunnel.
HAR	Hawai`i Administrative Rules.
HART	Honolulu Authority for Rapid Transit.
HCDA	Hawaii Community Development Authority.
HECO	Hawaiian Electric Company.
HEPA	Hawai`i Environmental Policy Act
HFD	Honolulu Fire Department.
HHFDC	Hawai`i Housing and Finance Development Corporation.
HHG	Howard Hughes Group.
HPD	Honolulu Police Department.
HPU	Hawai`i Pacific University.
HRS	Hawai`i Revised Statutes, as amended.
HTCo.	Hawaiian Telcom.
HUD	Federal Department of Housing and Urban Development.
Iconic Tower	A residential tower that exceeds current height limits (by up to several hundred feet).
ID	Improvement District.
Shared Industrial Street	***A street in Central Kaka`ako whose usage includes frequent vehicular activity related to abutting light industrial uses along it.***
JABSOM	John A Burns School of Medicine.
JMK	John M. Knox & Associates
KCDD	Kaka`ako Community Development District.
KMCMP	Kaka`ako Makai Conceptual Master Plan.

KS	Kamehameha Schools.
KV or kV	Kilo-volt.
LCA	Land Commission Award, a land title originally granted by the Kingdom of Hawai`i.
LEED	Leadership in Energy and Environmental Design.
LID	Low impact development.
LF	Linear feet.
LOS	Level of Service.
M	Meter.
MAIP	Mauka Area Infrastructure Plan, May 2009.
Makai Area	The Makai portion of the Kaka`ako Community Development District, bounded by Ala Moana Boulevard, Ala Moana Regional Park, the ocean, and the property line between Pier 2 and Pier 4 at the Honolulu Harbor shoreline.
Mauka Area	The Mauka portion of the Kaka`ako Community Development District, bounded by Ala Moana Boulevard, Piikoi Street, South King Street, and Punchbowl Street.
MGD	Million gallons per day.
Mm	Millimeter.
MPH	Miles per hour.
MSL	Mean sea level.
MVA	Mega Volt-Amperes.
MW or Mw	Mega-watt.
M/yr	Meters per year.
Negotiated Open Spaces	***Areas of open space that have been identified and required during the HCDA's review of a Development Permit application.***
NRCS	Natural Resource Conservation Service.
NBC	Neil S. Blaisdell Center.
NN	Nelson/Nygaard; the transportation consulting firm contributing to the EIS.
NPDES	National Pollutant Discharge Elimination System.
NRHP	National Register of Historic Places.
NWS	National Weather Service.
OEQC	State of Hawai`i Office of Environmental Quality Control.
OHA	State of Hawai`i Office of Hawaiian Affairs.
OIBC	O`ahu Island Burial Council.
OP	State Office of Planning.
OTWC	Oceanic Time Warner Cable.
PPM	Parts per million.
PM	Particulate matter.
Proposed Action	The implementation of transit oriented development in Kaka`ako.
Psi	Pounds per square inch.
PUC	Primary Urban Center.

ROW	Right-of-way.
SCIA	Supplemental Cultural Impact Assessment.
SCP	Sustainable Communities Plan. The City and County of Honolulu recognizes seven regional planning areas: two Development Plan areas and five SCP areas.
SCS	U. S. Soil Conservation Service.
SF	Square foot or square feet.
SIA	Socio-economic impact assessment.
SEIS	Supplemental environmental impact statement.
SF	Square feet.
SFHA	Special Flood Hazard Area.
SHPD	State Historic Preservation Division of the State of Hawai`I Department of Land and Natural Resources.
SIHP	State Inventory of Historic Places.
SLUC	Hawai`i State Land Use Commission (also referred to as LUC).
SMA	Special Management Area.
SOEST	Hawai`i School of Ocean and Earth Sciences and Technology.
SPS	Sewage pump station.
TAT	Transit accommodations tax.
TAZ	Transportation analysis zone.
TCP	Traditional Cultural Property.
TDM	Transportation Demand Management; a collection of strategies to manage the demand for scarce parking and roadway capacity.
TheBus	Municipal bus service operated by the City and County of Honolulu.
TMK	Tax Map Key, the method of land mapping employed by the State of Hawai`i and the City and County of Honolulu for the purposes or real property assessment.
TOD	Transit-Oriented Development.
TOD-A	Transit-Oriented Development Alternative A.
TOD-B	Transit-Oriented Development Alternative B.
TOD Overlay Plan	A comprehensive analysis of the issues and opportunities associated with TOD in Kaka`ako.
TMA	Transportation Management Association.
TMK	Tax Map Key.
UIC	Underground injection control.
Ug/l	Micrograms per liter: equal to one millionth of a gram.
U.S.	United States.
USFWS	United States Fish & Wildlife Service.
USGS	United States Geological Survey.
VA	Federal Veterans Administration.
v/c	Volume-to-capacity ratio.
VIA	The consulting architectural firm contributing to the EIS.
VMT	Vehicle miles traveled.
VPH	Vehicles per hour.

WWTP	Wastewater treatment plant.
WWPS	Wastewater pump station.

FEIS Compliance			**11-200-17 Content requirements for Draft EIS (applicable to SEIS per 11-200-28)**
	A		The Draft EIS shall contain at a minimum the information contained in this section (11-200-17)
	B		Summary Sheet with the following
ES Section 0.1		1	Brief description of the Proposed Action
ES Section 0.3		2	Significant beneficial/adverse/cumulative/secondary impacts
ES Section 0.4		3	Proposed mitigation measures
ES Section 0.1		4	Alternatives considered
ES Section 0.5		5	Unresolved issues
ES Section 0.6		6	Compatibility with land use plans/policies; listing of permits/approvals
Beginning of each Chapter	C		Table of Contents
Chap 1 Section 1.1	D		Statement of Purpose/Need for the Proposed Action
Chap 2	E		Project Description with enough detail to evaluate environmental impacts
Chap 1 Figure 1-1		1	Detailed map (USGS topo, FIRM, or floodway boundary)
Chap 2 Section 2.2		2	Statement of objectives
Chap 2 Section 2.3		3	General description of action's characteristics:
Chap 2 Section 2.3.4		a	technical
Chap 4 Section 4.10		b	social
Chap 4 Sections 4.1 to 4.4		c	environmetal
ES Section 0.3		4	Use of public funds or lands for the action
Chap 2 Section 2.4		5	Phasing and timing of the action
various figures throughout		6	Summary technical data, diagrams etc. for evaluation of potential impacts
Chap 1 Section 1.8		7	Historic perspective
Chap 3	F		Rigorous exploration and objective evaluation of alternatives
Chap 3 Section 3.2		1	No action
Chap 3 Sections 3.3 & 3.4		2	Different nature with similar benefits and different environmental impacts
Chap 3 Section 3.4.3		3	Alternate designs or details
Chap 3 Section 3.2		4	Postponing the action
Chap 3 Section 3.4.2		5	Alternative locations
Chap 3 Section 3.3		6	Comparative evaluation of benefits, costs, risks of reasonable alternatives
Chap 4	G		Existing environmental setting
Chap 2 Section 2.3.1		1	Local
ES Section 0.1		2	Regional
Chap 4 Section 4.3.1		3	Rare or unique environmental resources
Chap 1 Section 1.2.3		4	Related projects in area contributing to possible cumulative effect
Chap 4 Section 4.10.2		5	Area's population/growth characteristics & assumptions used to justify the action
Chap 6 Section 6.5		6	Secondary population/growth characteristics
Chap 5	H		Relationship of Proposed Action to land use plans, policies and controls
Chap 5		1	For conflicts, extent to which conflict has been reconciled and reasons for proceeding
Chap 2 Section 2.5		2	List of necessary approvals and status of each
Chap 4	I		Statement of probable impacts
Chap 4		1	Consideration of all phases
Chap 4		2	Direct/indirect
Chap 1 Section 1.2.3		3	Interrelationships and cumulative impacts of Action and other related projects
Chap 6 Section 6.5		4	Secondary impacts
Chap 4 Section 4.10.2.2		5	Estimated population impacts
Chap 4 Section 4.10		6	Effects of population change
Chap 4 Sections 4.8 & 4.9		7	Direct or indirect sources of pollution
Chap 6	J		Relationship between local short-term uses of environment and maintenance/enhancement of long-term productivity
Chap 6 Section 6.2.1		1	Trade-offs/short-term & long-term gains/losses
Chap 6 Section 6.2.2		2	Extent to which Proposed Action forecloses future options
Chap 6 Section 6.2.3		3	Narrows range of beneficial uses
Chap 6 Section 6.2.4		4	Poses long-term risks to health and safety
Chap 6 Section 6.2.6		5	Environmentally signficant consequences
Chap 6 Section 6.3	K		Irreversible/irretrievable commitments of resources
Chap 6 Section 6.3.1		1	Unavoidable impacts
Chap 6 Section 6.3.2		2	Use of non-renewable resources
Chap 6 Section 6.2.3		3	Curtails range of benefical uses
Chap 6 Section 6.3.3		4	Possibility of environmental accidents resulting from any phase of Proposed Action
Chap 6 Section 6.3.4		5	Loss/destruction of natural/cultural resources
Chap 4	L		All probable adverse environmental effects that cannot be avoided
Chap 6 Section 6.3.2		1	Rationale for proceeding with Action, notwithstanding, adverse effects
Chap 6 Section 6.4		2	Other governmental policies that offset adverse environmental effects
Chap 6 Section 6.4		3	Ability of reasonable alternatives to achieve countervailing benefits to avoid adverse effects
Chap 4	M		Mitigation measures
Chap 4		1	Basis for determining mitigations to reduce impacts to insignificant levels
Chap 4		2	Timing of mitigations/commitments to assuring mitigation
Chap 6 Section 6.6	N	1	Summarize unresolved issues
Chap 6 Section 6.6		2	How they will be resolved prior to implementing action or overridding reasons for proceeding without resolution
Chap 8 Section 8.2	O	1	Consulted parties
Chap 7 Section 7.1		2	Disclosure of preparers
Chap 8 Section 8.3	P	1	Reproduction of all substantive comments and responses
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Chapter One:
Purpose and Need

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1.0 Statement of Purpose and Need

1.1 Purpose and Need for the Environmental Impact Statement

Purpose: The environmental assessment discussed in this document is presented in accordance with the requirements of Hawai`i's Environmental Protection Act ("HEPA"), Chapter 343 of Hawaii Revised Statutes as amended ("HRS"), and Chapter 11-200, Hawaii Administrative Rules ("HAR"), the rules governing the Office of Environmental Quality Control ("OEQC"). Section 11-200-5B, HAR, requires that "…when an agency proposes to implement an action to use state or county lands or funds, it shall be subject to the provisions of chapter 343, HRS, and this chapter." This EIS is intended to fulfill this requirement.

This EIS also fulfills the requirement established by the Environmental Quality Commission, pursuant to its Declaratory Ruling No. 80-01, issued on May 22, 1980, and by the Environmental Council, pursuant to its Declaratory Ruling No. 84-01, issued on March 28, 1984. As stated in its ruling in 1980:

> *"…an environmental impact statement should be prepared for the entire Kaka`ako Development District Plan as a "…group of proposed or possible actions" taken as a comprehensive whole. Such an approach would dictate that the initial statement would be general and broad, dealing with the impacts of development policies, goals, concepts and strategies, all commensurate with the level of initial-phase considerations involved in the planning process."* (Dec. Ruling 80-01)

In Chapter 206E, Hawaii Revised Statutes (HRS) as amended, Kaka`ako is designated as a Community Development District (KCDD) under the jurisdiction of the Hawaii Community Development Authority (HCDA) - a body corporate and public instrument of the State of Hawai`i responsible for planning and revitalizing redevelopment areas. In 1976, the State Legislature set forth its purpose for creating the HCDA:

> *The legislature further finds that there exists within the State vast, unmet community development needs. These include, but are not limited to, a lack of suitable affordable housing; insufficient commercial and industrial facilities for rent; residential areas which do not have facilities necessary for basic liveability, such as parks and open space; and areas which are planned for extensive land allocation to one, rather than mixed uses.*
>
> *It is further determined that the lack of planning and coordination in such areas has given rise to these community development needs and*

that existing laws and public and private mechanisms have either proven incapable or inadequate to facilitate timely redevelopment and renewal.

The legislature finds that a new and comprehensive authority for community development must be created to join the strengths of private enterprise, public development and regulation into a new form capable of long-range planning and implementation of improved community development. The purpose of this chapter is to establish such a mechanism in the Hawaii community development authority, a public entity which shall determine community development programs and cooperate with private enterprise and the various components of federal, state, and county governments in bringing plans to fruition. For such areas designated as community development districts, the legislature believes that the planning and implementation program of the Hawaii community development authority will result in communities which serve the highest needs and aspirations of Hawaii's people.

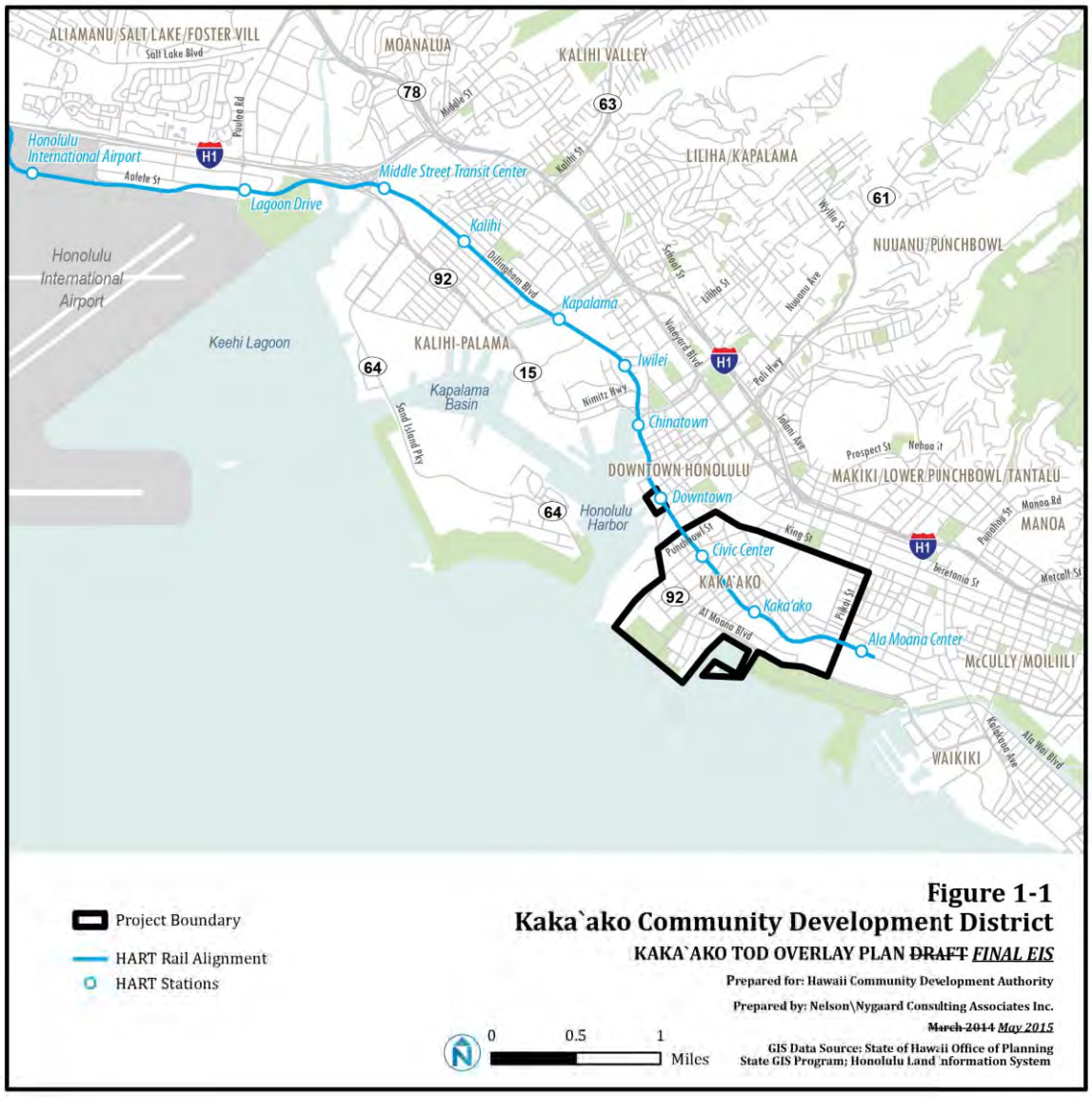
The legislature finds that the creation of the Hawaii community development authority, the establishment of community development districts, and the issuance of bonds pursuant to this chapter to finance public facilities serve the public interest and are matters of statewide concern. (Section 1, Chapter 206E, HRS)

By direction of the State Legislature, Kaka`ako has been identified as a significantly underdeveloped and underutilized relative to its central location in urban Honolulu and HCDA has been tasked with planning for the redevelopment of the KCDD. The original Community Development District encompassed the Mauka Area. In 1983, the HCDA adopted a separate plan for the Makai Area. Today, the KCDD includes both the Mauka and Makai Areas, as well as the Aloha Tower Special District. (see Figure 1-1)

In 2005 the HCDA embarked on a comprehensive review of the Mauka Area Plan and Rules to address livability, urban design and upgrading infrastructure needs. This Plan was developed around smart growth concepts, and was adopted in 2011. A supplemental environmental impact statement (SEIS) was prepared to assess the impacts of the proposed rules. In 2011, the Governor accepted the Final Supplemental EIS for the Draft Mauka Area Plan as fulfilling the requirements of Chapter 343, HRS. The HCDA Board subsequently approved the rules implementing the Mauka Area Plan.

As set forth in the 2011 Conceptual Master Plan for the Makai District, the area of the KCDD makai of Ala Moana Boulevard (and including the Aloha Tower Special District) is envisioned as the community's gathering place that welcomes all people with enriching cultural, recreational, and educational public uses.

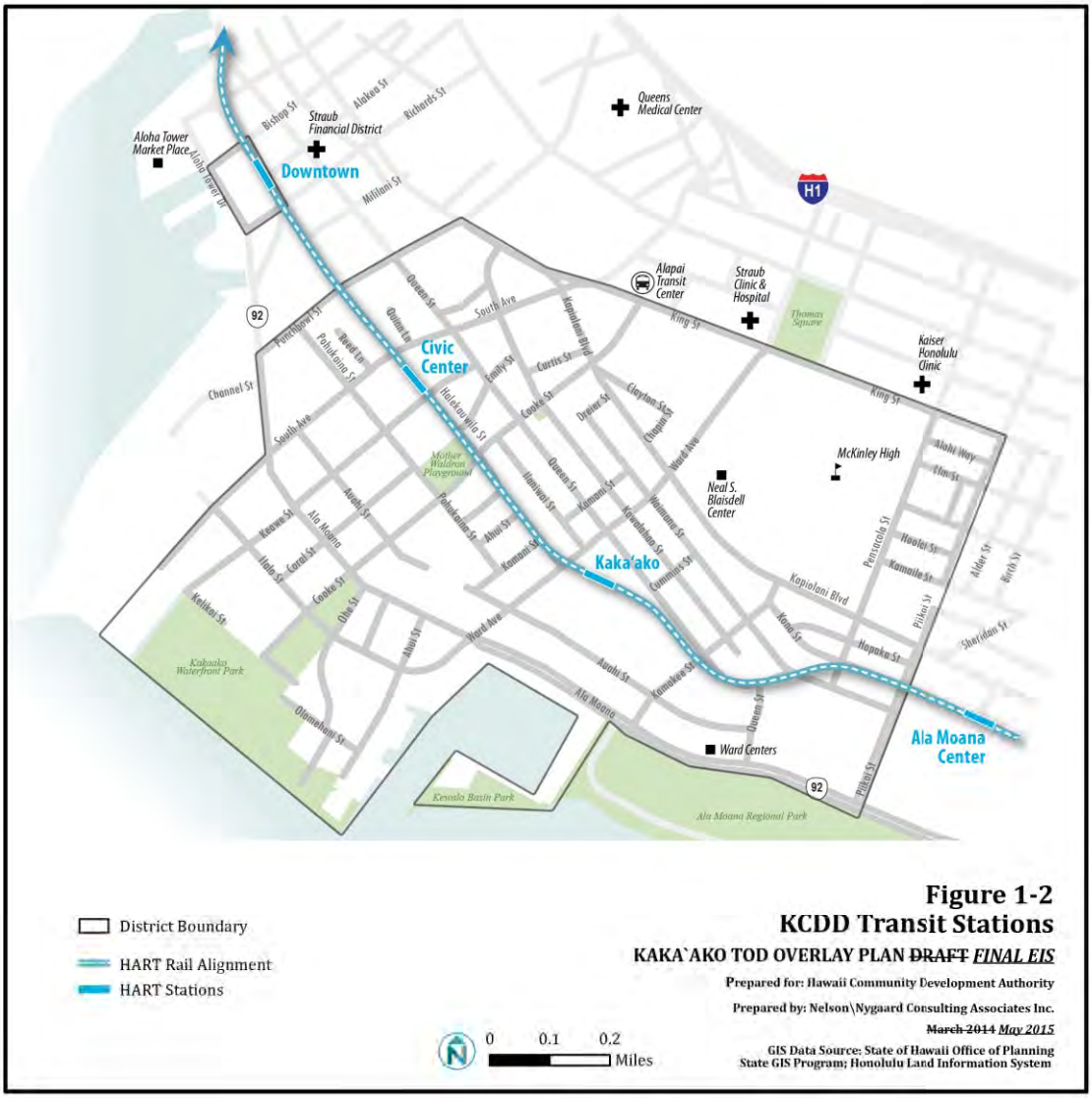
Figure 1-1: Kaka`ako Community Development District



In 2012, the Honolulu City Council approved an alignment for the Honolulu Authority for Rapid Transportation (HART) elevated light-~~rail~~ ***metro*** ~~transit~~ system. The alignment identified three transit stations in within the Kaka`ako Community Development District: two in Kaka`ako Mauka (the Civic Center and Kaka`ako stations) and one at the Aloha Tower Special District (the Downtown station). (see Figure 1-2)

In response to this action, HCDA retained consultants to prepare a plan to address the future opportunities presented by the introduction of an elevated light rail

Figure 1-2: KCDD Transit Stations



system or the expansion of other forms of public transit in Kaka`ako. The Draft Transit Oriented Development Overlay Plan (hereinafter, "Draft TOD Overlay Plan") was published in May 2013 and distributed for public review (see Appendix A).

Subsequent to publication of the Draft TOD Overlay Plan, concerns were raised about excessive density in the KCDD and the effects of increased building heights upon existing residents. In response to these and other concerns, the 2014 State Legislature approved House Bill 1866 (House Draft 2, Senate Draft 1) that, among other things, limited building heights in the Mauka Area to 418 feet (400 feet plus appurtenant facilities such as elevator equipment), thereby reducing allowable building densities. On April 30, 2014, the Governor signed the bill into law as Act 61.

For the purposes of this EIS, the Draft TOD Overlay Plan is identified as TOD Alternative A. The urban design scenario resulting from the adoption of Act 61 is identified in this EIS as TOD Alternative B. This EIS discloses the environmental, social, and economic impacts that will result from the implementation of either TOD Alternative A or TOD Alternative B. Once this EIS has been completed, the Draft TOD Overlay Plan may require revisions to accommodate the findings of the EIS. Ultimately, the HCDA will determine what course of action to take regarding transit-oriented development, that is to say: select TOD Alternative A and amend the Mauka Area rules to implement it[1], select TOD Alternative B and amend the Mauka Area rules to implement it, or elect to take no action to amend the Mauka Area rules.

For the purposes of this EIS, while no specific course of action is recommended, the Proposed Action is defined as the implementation of either Alternative TOD-A or Alternative TOD-B. The impacts of both alternatives (TOD-A and TOD-B) as they relate to the implementation of the land uses, urban design standards, mobility and access policies, Complete Streets initiative, and parking and transportation demand management strategies among other things are disclosed in this EIS.

Need: TOD Alternative A and TOD Alternative B both respond to the recent approval of the HART elevated rail system and the designation of three transit station locations within the KCDD. The coming introduction of rail transit - in parallel with community driven interest in creating a city that is highly walkable, friendly and safe for pedestrian and cyclists and not entirely dependent on vehicular modes of transportation – was an impetus for the analysis. It should be noted that a changing transportation paradigm is only a representation of a much broader movement to bring vitality to urban Honolulu, reflecting the values of the native Hawaiian culture, particularly stewardship of the land and environment, preservation of the native culture, openness to the visiting world, and responsibility to local people and their prosperity.

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[1] However, so long as Act 61 remains in force, building heights in the Mauka Area cannot exceed 418 feet. If the HCDA Board elects to implement TOD Alternative A, it must still comply with the provisions of Act 61.

Honolulu and urban O`ahu are regarded as places of great natural beauty with a unique quality of life. However, O`ahu faces a number of challenges including high housing costs, high energy prices, high levels of traffic congestion and automotive vehicle dependence, increasing obesity rates, urban design that restricts or limits walking and healthy activities, and a high level of dependence on imported oil for energy and mobility.

Transit-oriented development can help to address each of these challenges, particularly in urban areas where good bus service and pedestrian infrastructure is already in place, amenities and services are abundant, and major job centers are in close proximity. The implementation of either TOD Alternative A or TOD Alternative B in the KCCD represents the region's best opportunity to create a thriving urban neighborhood that reduces per capita demands on energy, land, and other valuable resources; creates affordable housing opportunities; and reduces the overall cost and impact of living, while simultaneously building a culturally rich and vital urban neighborhood in the heart of urban Honolulu.

1.2 Location of the Proposed Action

The 601.6-acre KCDD is situated within the Kona district of the Honolulu ahupua`a and is part of the Primary Urban Center. It is prominently located less than a mile east of Honolulu's central business district, and between the densely populated Punchbowl district to the north, Ala Moana Shopping Center and Waikiki to the east, and the Downtown area and Honolulu Harbor to the west.

The KCDD consists of 603 separate properties. The tax map numbers for these properties are presented in Table 1-1.

1.2.1 Mauka and Makai Areas

Within the KCDD there are two planning areas, each with its own unique set of land use policies. The Mauka Area is bounded by South King Street, Punchbowl Street, Ala Moana Boulevard and Piikoi Street. It is envisioned as the residential, commercial and retail mixed-use neighborhood of the KCDD.

Located makai of Ala Moana Boulevard, the Makai Area consists primarily of state and agency controlled land along the waterfront. It is bounded by Ala Moana Boulevard on the north, Ala Moana Regional Park on the east, Forest Avenue and the property line between Honolulu Harbor's Pier 2 and Pier 4 on the west, and the Pacific Ocean on the south. (See Figure 1-3) The Makai Area is envisioned as the community's gathering place for cultural, recreational, and educational public uses. On April 11, 2012, the Governor of Hawai`i, Neil Abercrombie, signed into law a bill that transferred 10 parcels of land totaling approximately 25 acres to the Office of Hawaiian Affairs (OHA) for settlement of its ceded lands claims. OHA is presently

engaged in the preparation of a master plan to determine the best use of those lands.

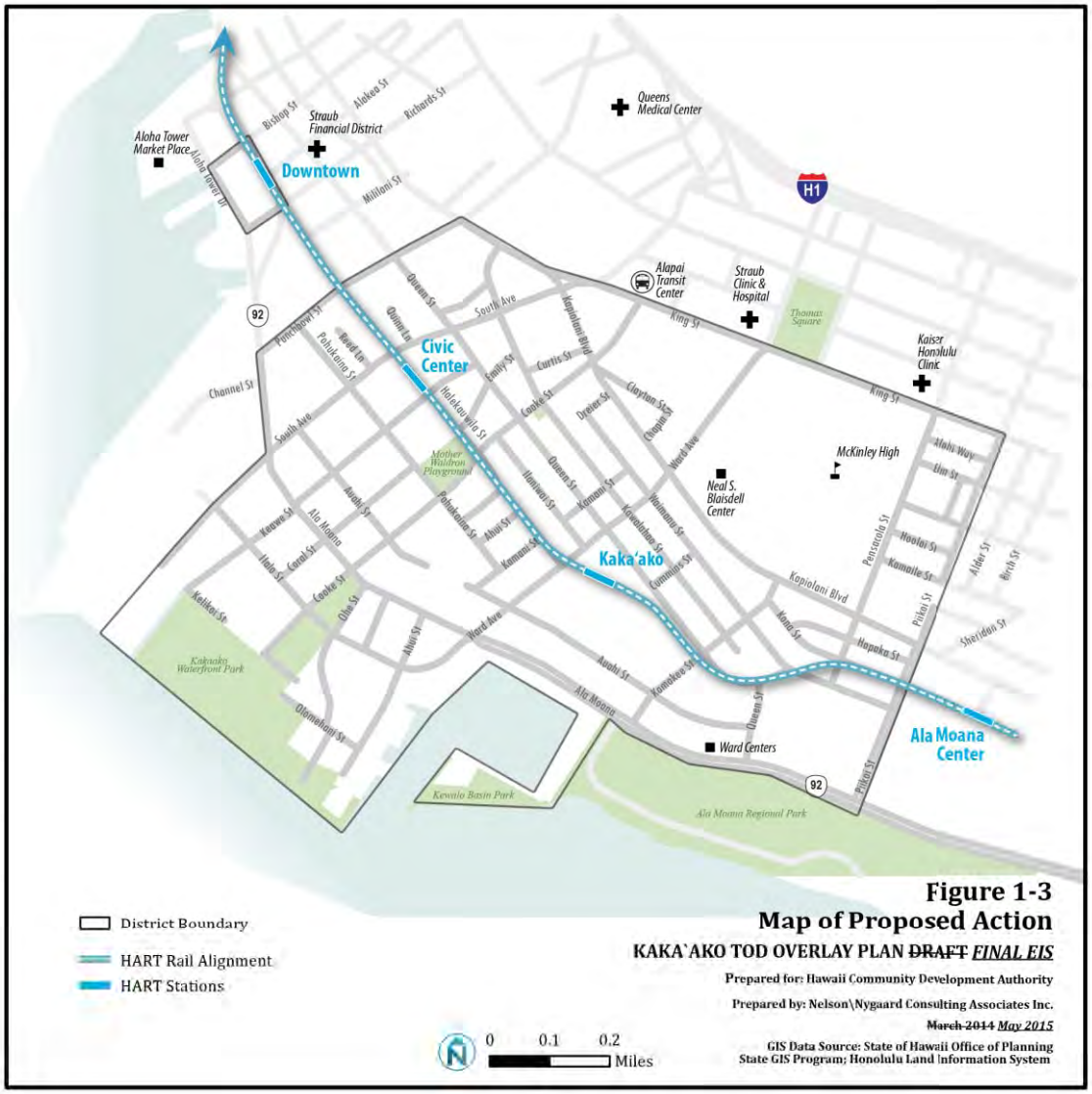
The Makai Area also includes a 3.4-acre parcel in Downtown Honolulu identified as the Aloha Tower Special District (ATSD). The parcel is owned by the Hawaiian Electric Company's (HECO) and includes its downtown power plant. It is situated on the makai side of Ala Moana Boulevard and is bounded by Richard Street, Bishop Street, and Aloha Tower Drive. It is adjacent to Irwin Park, the Downtown Financial District and the Aloha Tower redevelopment area.

Table 1-1: Kaka`ako Community Development District Tax Map Keys

Zone	Section	Plat	Parcel
2	1	015	009, 051, 052, 061-063
2	1	029	001, 002, 010
2	1	030	001, 003, 006-015, 017, 043
2	1	031	001-005, 008, 010, 012, 015, 018-021, 024, 029-033
2	1	032	001, 002, 007-012, 015, 017, 020, 022-024
2	1	044	001-005, 022, 023, 032-034, 038-044, 046-048
2	1	046	001-003, 005, 007-010
2	1	047	001-006, 008, 010
2	1	048	001, 002, 005-008, 022
2	1	049	001, 003-005, 008-033, 037, 038, 040-043, 045-050, 054-061, 063-066, 068-076, 078-080
2	1	050	001-004, 007, 009-025, 027, 028, 030-043, 045-050, 052-065, 067, 068
2	1	051	001-007, 010-014, 018, 019, 031, 033, 038, 040-044
2	1	052	001-005, 007-013, 016, 017, 020, 022, 024, 027, 028, 031-036, 038-040, 042, 043, 045, 046, 051-054
2	1	053	001, 030-032
2	1	054	001, 021, 022, 025, 027, 028, 032, 033
2	1	055	001-004, 006, 009, 017, 018, 021, 026, 032-035, 038
2	1	056	001-004, 007, 008
2	1	058	002, 006, 021, 035, 043, 048, 061, 069, 073, 088, 089, 094, 095, 099, 100, 101, 103, 105, 109, 124-128
2	1	059	001, 003-006, 011, 013, 020, 021, 023-029
2	1	060	001-009, 013, 015, 017
2	3	001	001, 004
2	3	002	001, 002, 057-059, 066, 067, 069, 086, 087, 104
2	3	003	004-008, 011-015, 018-024, 026, 028, 030-034, 037 038, 040, 043, 046-050, 052, 059, 061-069, 071, 073-075, 078, 080, 081, 083, 085-087, 089-095, 097-099, 103, 105

2	3	004	002, 003, 007-010, 012, 025, 029, 031, 033-037, 039, 048, 051, 061, 065, 069, 071, 076, 079, 080
2	3	005	001, 004-006, 012-017, 019, 022
2	3	006	001, 003, 004, 014-017
2	3	007	023, 026-029, 033, 036, 039, 044, 045, 049, 054, 056, 057, 061-064, 066, 067, 069, 078, 091-093, 098-101, 104, 105,107
2	3	008	001-003
2	3	009	001
2	3	010	001-009, 011-028, 083, 092-094, 096-107, 111
2	3	011	002-025, 029-051, 053, 054

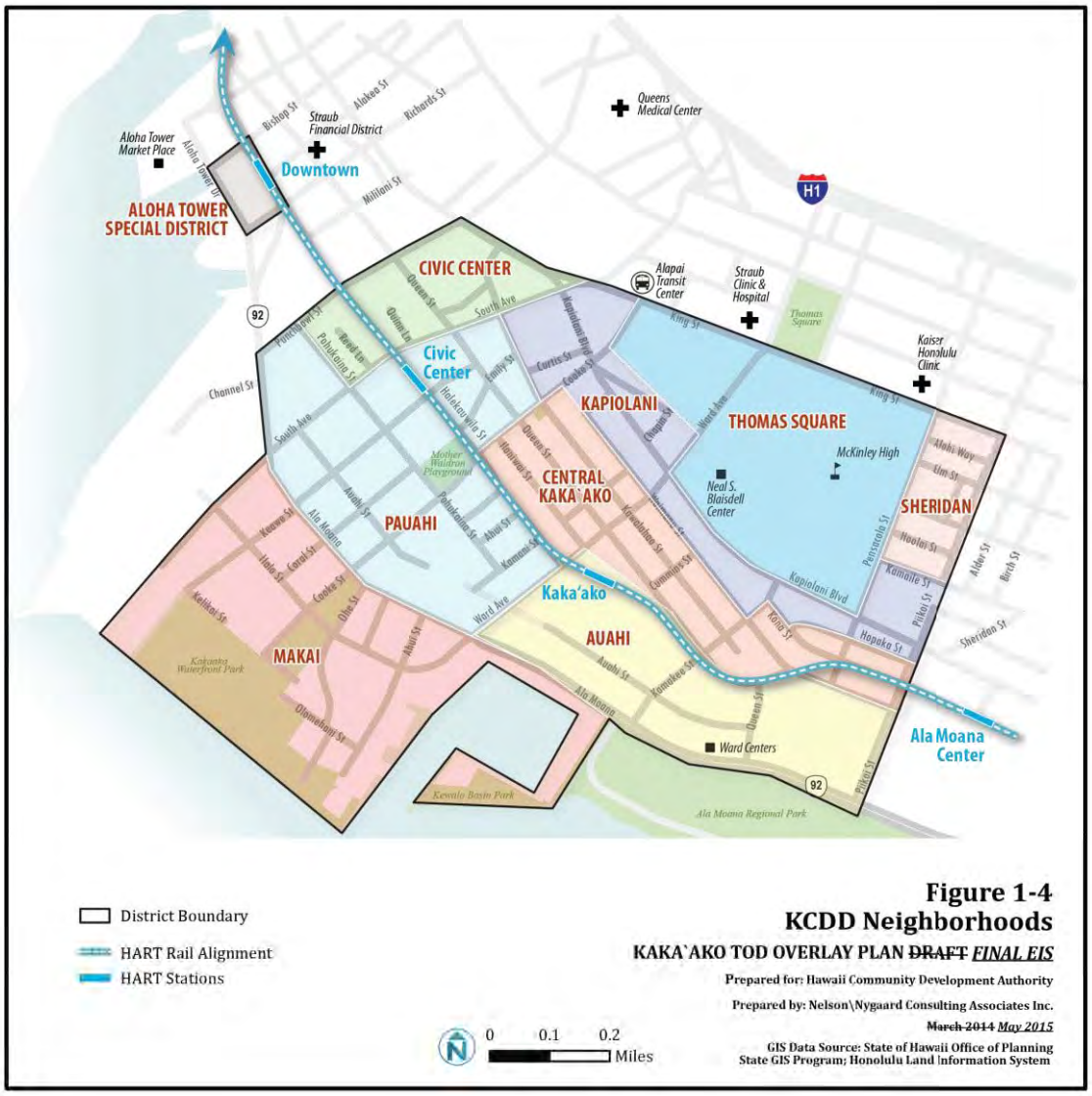
Figure 1-3: Map of Proposed Action



1.2.2 Neighborhoods

For planning purposes, the HCDA has defined 7 neighborhoods in the Mauka Area, the Makai Area, and one special district within the KCDD. (See Figure 1-4)

Figure 1-4: KCDD Neighborhoods



Pauahi Neighborhood is presented in the Mauka Area Plan as a mixed-use "urban village." The name of the neighborhood honors the legacy of Princess Bernice Pauahi Bishop, who is the benefactor of Kamehameha Schools - the major landowner in this area. HART's proposed Civic Center station is located within this neighborhood. The Mauka Area Plan envisions the Pauahi neighborhood as a high-rise area with pedestrian scaled podiums and active frontages. Several properties on the mauka

side of Ala Moana Boulevard are owned by Kamehameha Schools. The implementation of the Kamehameha School's Master Plan will help to activate the Pauahi neighborhood and potentially areas along busy Ala Moana Boulevard.

Auahi Neighborhood is emerging as Kaka`ako's retail and entertainment center. Recent development has generated a marked increase in pedestrian activity, particularly in the vicinity of Auahi and Kamakee Streets. This activity is expected to multiply as the Howard Hughes Corporation, the majority landholder in this neighborhood, builds out its master plan. The Auahi neighborhood is envisioned to expand upon its retail and entertainment base providing active frontages and lively pedestrian environment with high-rise residential towers above. HART's proposed Kaka`ako Station is slated to be built on the master planned property making this district a gateway to Kaka`ako's Kewalo Basin Harbor and waterfront promenade for rail transit patrons.

**Kapi`olani Neighborhood** is a place where land uses are strongly influenced by the busy Kapi`olani Boulevard corridor. As a link between Downtown Honolulu and Waikiki, the Kapi`olani corridor is an attractive location for high-rise mixed-use development, including retail stores, services and showrooms at grade level, and office and residential uses on higher floors. The continuous canopy of monkeypod trees and wide planting strip at the curb line lends a distinctive character to the corridor that enhances its value for future development and as a shaded, comfortable street for pedestrian traffic. The entire neighborhood is within a five-minute walk from either a proposed HART station or one of TheBus transfer stations.

Thomas Square District is a neighborhood makai of the historic Thomas Square Park. (Thomas Square Park is not contained within the Thomas Square District because the park lies outside of the KCDD.) The park is surrounded by properties that are home to some of Honolulu's major cultural and educational venues – the Honolulu Museum of Art, the Neal S. Blaisdell Center, and McKinley High School. The majority of the Thomas Square District land west of the park is owned by the City and County of Honolulu, Hawai`i State Department of Education, and the Hawaiian Electric Company. While there are no immediate redevelopment plans for the lands west of the park, these properties are in many ways ideal candidates for transit-oriented redevelopment. The properties are large, relatively under-utilized, and well connected to the urban grid and a wealth of services and amenities. Blaisdell Center and McKinley High School are situated within the Thomas Square District.

Central Kaka`ako is composed primarily of small lots with individual ownership. Predominate land uses in this area are service businesses, many with an industrial character, such as repair shops and production facilities. As a distinct reminder of the district's legacy as a light-industrial and residential community, Central Kaka`ako is valued as a convenient location for service businesses and envisioned to maintain its existing character because of the important role these businesses will play in providing services to the many new residents expected to move into the

area. Significant redevelopment is not expected in this area because of the small lot size. However, some improvements are needed and there are opportunities to create more pedestrian tolerant linkages between other important redevelopment areas and HART stations.

Civic Center is characterized by government and other important civic buildings spread out in a campus-like setting. Only a small portion of this neighborhood falls within the KCDD and therefore TOD has a relatively minor influence on the overall character of the neighborhood. HART's proposed Civic Center station will be located within a five-minute walk from most government buildings providing employees convenient access to rail transit. Given the existing campus character and the scale and ambiance of the significant and historic buildings in this area, existing zoning parameters will remain in place.

Sheridan Neighborhood is predominately a residential neighborhood composed of small, fee-simple lots. This established community also includes active commercial uses fronting King Street and the historic Makiki Christian Church located along Pensacola Street. The KCDD's Sheridan neighborhood area represents approximately half of the larger Sheridan Tract, which is bisected by Piikoi Street. The land use, small lot size, block size and land tenure patterns within the Sheridan Neighborhood are very similar to the other half of Sheridan Tract, which is located on the Diamond Head side of Piikoi Street, just outside the KCDD. While some building renovations and redevelopment occurs in this area, the scale and pace of change is slight compared other areas of Kaka`ako. Residents in this neighborhood will be within walking distance of HART's proposed Ala Moana Station.

Aloha Tower Special District is a single property that is a part of a much larger neighborhood near downtown Honolulu. The property is owned by the Hawaiian Electric Company and is situated mauka of the Aloha Tower Marketplace and entertainment complex. It is immediately adjacent to HART's proposed downtown station. In early 2013, Hawai`i Pacific University secured the lease of the Aloha Tower Marketplace property and announced its intention to locate student dormitories on a portion of the property. This proposed use is consistent with and supportive of transit-oriented development.

**Kaka`ako Makai Area** contains a mix of commercial and public land uses. It includes Kewalo Basin, the Kaka`ako Waterfront Park, the Gateway Park, and the John A. Burns School of Medicine, as well as the former Gold Bond Building, the Children's Discovery Center, several private businesses, and cargo operations at Fort Armstrong. As discussed above, the jurisdiction over approximately 25 acres of the Makai Area was transferred to OHA in 2012.

1.2.3 Non-Governmental Master Plans

Two areas within the KCDD are governed by master plans that were adopted prior to the enactment of the development rules for the Mauka Area in 2011 (see Figure 1-5).

Kamehameha Schools adopted the Kaioulu`o Kaka`ako Master Plan in 2010 for 29-acres (nine blocks) within the Pauahi neighborhood. The Master Plan is in keeping with the vision and requirements set forth by the HCDA in its Mauka Area Plan (2005). The KS Master Plan envisions a mixed-use urban neighborhood with a variety of housing options, retail and office spaces and an emphasis on pedestrian comfort, community and public realm improvements and street level open spaces. Its series of design strategies are generally consistent with the Mauka Area Plan (2005). The Master Plan has a focus on mixed-income uses with an estimated 550 Reserved Housing units (it is noted that the actual total of units will depend on the building costs, exactions and the strength of the economy). Kamehameha Schools also proposes approximately 2,750 residential units including lofts, townhouses and townhomes in up to seven residential towers. HART Civic Center Station is proposed adjacent to KS Block A at the corner of South and Halekauwila Streets.

The approximately 60-acre Ward Neighborhood Master Plan is also in conformance with the Mauka Area Plan (2005). The Master Plan focuses on the development of a high-density retail, residential and entertainment center within the Auahi neighborhood of the Mauka Area. The Ward Neighborhood Master Plan provisions also include street improvements to break down the existing large blocks, the provision of public active spaces at the street level, and major pedestrian enhancements. Improvements to Auahi Street as a retail corridor are coordinated with the Kamehameha School Master Plan. The Ward Neighborhood Master Plan is flexible enough to accommodate a variety of housing markets from luxury, to market rate to reserved housing as well as retail and commercial uses. The actual program for each block may vary depending on market demand and opportunities. Kaka`ako Station will be located at the corner of Ward Avenue adjacent to Halekauwila Street on the Ward Neighborhood Master Plan properties.

Implementation of the TOD Overlay Plan will present Kamehameha Schools and Howard Hughes Corporation with an opportunity to embrace new opportunities related to transit-oriented development. However, in order to do so, the existing master plan must be formally amended and that amendment must be approved by HCDA.

1.3 Overview of TOD Alternatives A and B

Implementation of either TOD Alternative A or TOD Alternative B would constitute a supplementary action that overlays the Comprehensive Plan for the Makai Area

(2011), and the Mauka Area Plan (2011) and implements Smart Growth objectives. Development under either alternative further focuses growth with an emphasis on transit-oriented development (TOD), and transit-friendly transportation planning strategies. The Alternatives' purpose is not to redefine the vision from this earlier effort, but rather, to utilize TOD to enhance Kaka`ako as a whole and the Mauka Area in particular (all three proposed KCDD transit stations are situated in the Mauka Area). The effort follows upon a statewide interest in TOD strategies as a positive

Figure 1-5: Master Plan Areas

tool for land use planning. TOD opportunities are defined by the State Office of Planning in the document *Leveraging State Agency Involvement in Transit Oriented Development to Strengthen Hawaii's Economy*:

> "TOD is an implementation tool for achieving "smart growth," defined as compact, mixed-use, transit-linked, and walkable communities. Its primary goal is to reduce consumption of undeveloped land by concentrating development, rather than allowing low-density suburban sprawl to consume a larger land area."[2]

Related efforts have included station area planning by the City & County of Honolulu along the HART proposed alignment.

Implementing either Alternative will increase overall development capacity within selected areas of the Mauka District. The primary purpose of either Alternative is to coordinate future urban redevelopment with the provision of HART rapid transit so that residents, employees and visitors can take advantage of improved mobility choices. The land use policies of either Alternative focus intensive mixed-use redevelopment into identified areas near to proposed HART transit stations. Either Alternative would include a set of comprehensive policies that aim to create a network of safe and comfortable streets with convenient access to HART stations. As associated with capacity increases, the Alternatives focus on tools to introduce an integrated transportation management with requirements for improved street connectivity, trip reduction (transportation demand management), transit enhancements (feeder service, connectors and local bus enhancements), pedestrian and bike improvements, shared parking and parking pricing. Neither Alternative proposes new development in the Makai District related to the proposed transit stations; however both Alternatives envision the integration of the Complete Streets concept throughout the Mauka and Makai Districts.

TOD Alternative A includes the following actions:

Land Use:

- Increase overall development capacity while reducing building volumes dedicated to storing automobiles;
- Identify specific properties for public/private joint development partnerships to function as TOD catalysts;
- Allow and promote a mix of building types;
- Provide a limited number of hotels for travelers and business professionals who wish to stay outside of Waikiki;
- Increase opportunities for Reserved (affordable) Housing;

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[2] State Office of Planning, *Leveraging State Agency Involvement in Transit Oriented Development To Strengthen Hawaii's Economy, 2012*

- Promote transit-friendly and community-supportive land uses that encourage "round the clock" activity in and near transit stations;
- Encourage preservation and adaptive re-use of *character* buildings that highlight the "old Hawaii" of the early 20th century;
- Identify specific properties within the Mauka Area for consolidation to promote redevelopment;
- Establish an incentive program to correlate allocation of active (open) spaces for additional height and capacity;
- Provide green connections and mid-block paths with redevelopment of consolidated parcels;

Urban Design:

- Increase maximum allowable building heights on a limited number of properties to encourage exemplary buildings that contribute to the District's identity;
- Provide a maximum of three *iconic towers* (heights between 550 and 700 feet), subject to the provision of exceptional public benefits;
- Preserve mauka-makai view corridors;
- Establish floor-plate controls ***(see page 4-15, Appendix A)*** for high rise towers;
- Ensure significant separations between *iconic towers*;
- Add flexibility to street frontage setbacks;
- Establish a design review process to ensure quality of building design;
- Encourage climate responsive design;

Mobility and Access:

- Require large developments to provide internal streets/pedestrian connections;
- Prioritize streets according to bicycle and pedestrian use, vehicle use, transit, and goods movement;
- Designate parking access and loading streets;
- Minimize curb-cuts needed for driveway access to reduce vehicle/pedestrian conflicts;
- Make walking and cycling access to transit stations as direct as possible;
- Implement a coordinated multimodal way finding program;
- Create a safe, comfortable, and well-connected pedestrian network;
- Promote district-wide accessibility to people of all ages and abilities;
- Develop a district-wide traffic calming plan;
- Encourage active sidewalks and transparent building facades;
- Provide street trees, weather protection, and other amenities;
- Provide high quality access to transit stations;

- Ensure seamless transitions between transit modes and pedestrian-oriented places;
- Implement a Downtown/Kaka`ako/Ala Moana circulator system that enhances access to HART stations and key KCDD destinations and those in adjacent districts;
- Create a complete network of high quality bicycle facilities;
- Promote KCDD as a cycling district;
- Work with local partners to develop a bike-share system in Kaka`ako;
- Improve access to bicycle parking and require new developments to include bicycle storage;
- Implement a Complete Streets program in KCDD;
- Remove minimum parking requirements;
- Balance parking supply and demand by including parking in *floor-area ratio* (FAR) calculations;
- Phase parking requirements and/or accommodate parking in satellite locations;
- "Unbundle" parking stalls from residential units to allow consumers to consider the optional purchase or rental of a stall;
- "Unbundle" parking costs from commercial leases;
- Accommodate tandem and stacked parking; and
- Promote car sharing in Kaka`ako.

<u>TOD Alternative B would generally include the same actions identified above, with the exception that new building heights would not exceed 418 feet in height as specified in Act 61</u>

1.4 Guiding Principles of Transit-Oriented Development

The overall goals of Transit-Oriented Development are to achieve the quality of life improvements as associated with well-planned, in-town densification tied to transit accessibility, non-vehicular infrastructure improvements and access to a broad mix of uses, public amenity and services. To implement these goals, TOD's guiding principles rely on six "D's" of transit oriented, pedestrian-focused community planning:

- D1: Destinations: Coordinate land use and transportation by concentrating development along reasonable direct corridors, so that most destinations are on the way to other destinations.
- D2: Distance: Create a well-connected street network using Complete Street Principles and maximize the area's capabilities to move people by developing environment where people walk, bike and take transit.
- D3: Design: Provide tools to ensure that the public realm is safe, comfortable and inviting for people of all ages and abilities.

- D4: Density: Concentrate and intensify activities near frequent transit and continue to encourage compact development in the Mauka area.
- D5: Diversity: Encourage a mix of uses, including opportunities for employment and residential, daily services, entertainment, public open spaces and entertainment.
- D6: Demand Management: Encourage the "auto trip not taken" through a systems management approach.

In summary the Transit-Oriented Development Overlay Plan aims to:

Reinforce local land use context - Focus improvements on those areas that have a higher potential for redevelopment including surface parking lots, and buildings that have exceeded their useful life, while maintaining those areas that are already functioning as an integral part of the KCCD community.

Provide a variety of land uses – Reinforce the mixed-use policies of the Mauka Area Plan, but further encourages land uses still missing from the area including a full service grocery store, a limited number of hotels, and cultural and community amenities.

Plan for Active Public Spaces - As Kaka`ako evolves, the provision of legible, accessible, and multi-functional public spaces are essential to neighborhood livability. Transit-Oriented Development provides guidelines for the provision of these spaces.

Apply Best Practices for balanced mobility – Envision the implementation of a comprehensive array of complete streets policies to develop a holistic transportation system in KCDD that is coordinated with the implementation of the HART rapid transit system, and maximize the capacity to move people by developing environments that encourage people to walk, bike and take transit, rather than driving for all trips.

1.5 Applicant and Accepting Authority

The ~~Applicant~~ ***Proposing and Determination Agency*** is the Hawaii Community Development Authority (HCDA).

The Accepting Authority for the EIS is the Governor of the State of Hawai`i. Pursuant to Chapter 343, HRS, the Accepting Authority must determine whether the Final EIS complies with the requirements of the law. That determination is not a judgment on the merits of the Alternatives presented in the EIS. Rather, it is a judgment as to whether the EIS fulfills the content and process requirements specified in Section 11-200 HAR, and whether or not all substantive comments received have been adequately addressed by the applicant, in this case, the HCDA.

1.6 Schedule for Transit-Oriented Development

For the purposes of this EIS, implementation of Transit-Oriented Development has a planning horizon of 2035, meaning that full build out of the development envisioned in the Alternatives is forecast to conclude by the end of that year. The analysis conducted for this EIS assumes 2013 as the baseline year, but includes data assembled from prior years by the State of Hawai`i, the City and County of Honolulu, and the large landowners in the district.

The planning horizon is specifically established to facilitate a comprehensive review of impacts for the purposes of environmental assessment. In actuality, full-build out of the KCDD will respond to market cycles that are not easily predictable. The year 2035 was selected as the planning horizon because at the time this document was being prepared, it is the horizon year utilized by the State and the City and County of Honolulu in its population projections.

1.7 Funding

Implementation of Transit-Oriented Development will be funded by a variety of sources including the HCDA, other agencies of the State of Hawai`i, the City and County of Honolulu, private property owners, and developers acting as agents of property owners.

1.8 Contemporary Historical Perspective

The State of Hawaii has a well-established planning context for encouraging growth in the Kaka`ako Mauka Area as part of the City and County of Honolulu's Primary Urban Center (PUC), an area extending from Kahala to Pearl City across the island's southern coastline. The City's PUC Development Plan, originally adopted in the mid-1980s, presents specific guidance for local government to "provide for high-density housing options in mixed-use developments around transit stations." [3] The PUC Development Plan also encourages "transit-oriented development" to facilitate transit use and allow for increased densities without generating increased vehicular congestion.

As described above, in 2012, Honolulu City Council adopted the Honolulu Area Rapid Transportation (HART) elevated transit alignment. Much of the Mauka Area is within a 5 to 10 minute walking distance from planned HART rapid transit stations (approximately .25 to .5 miles) at Kaka`ako Station and Civic Center Station. See Figure 1-6.

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[3] Primary Urban Center Plan, 2004 ES-4

Additionally, the KCDD has significant access to The Bus and local transit service; with the King and Kapolani as major service corridors; and stops on Punchbowl, King Street, and Ala Moana Boulevard among the busiest transit boarding locations in Honolulu.

The following describes the transit stations located within and influencing the planning context for the Proposed Action.

Figure 1-6: Walking Distance to HART Rapid Transit Stations

Civic Center Station: Located on Halekauwila Street between South and Keawe Streets, this station site is adjacent to land that is part of Kamehameha School's Kaioulu O Kaka`ako Master Plan area. A block away from the station is the historic Mother Waldron Neighborhood Park, which will be the beginning of Kamehameha

Schools' planned park-to-park connection down to the Kaka`ako Waterfront Park and the Pacific Ocean. In April 2014 the HCDA approved a development permit application for a residential, commercial mixed-use project on the land block bounded by Halekauwila, South, Pohukaina, and Keawe Streets. The Civic center Station is closely integrated as part of this development project.

Kaka`ako Station: This station is planned by the City to be located on property that is part of the Ward Master Plan. The station site is positioned on the corner of Ward Avenue and Queen Street and will operate as the closest stop to Kewalo Basin harbor, the Ewa side of Ala Moana Beach Park, the Diamond Head side of Kaka`ako Waterfront Park and the Blaisdell Arena, Exhibition and Concert Halls.

Downtown Station (at the Aloha Tower Special District): This station is located adjacent to the Aloha Tower Special District. This station will function as a connection between Aloha Tower and Honolulu's Central Business District. A pedestrian overpass is part of the design for the station, which will play a significant role in safely moving people over the Nimitz Highway/Ala Moana Boulevard corridor.

From a transportation perspective, despite reliable existing bus transit service and significant plans for improved high capacity transit access, pedestrian activity within the KCDD is low when compared to downtown or Waikiki. The streets are often wide and do not intersect at right angles, which can be difficult to cross with fast moving traffic. It has been well documented in preceding planning efforts, particularly in the Mauka Area Plan, (2011) that the KCDD street network is oriented towards vehicles and prioritizes automobile mobility to the detriment of other users. This emphasis however, is changing. The State of Hawaii's Complete Street Policy Act 054 provides a framework to address this imbalance. The State encourages local governments to enact "complete streets policy to reasonably accommodate convenient access and mobility for all users of the public highways – including pedestrians, bicyclists, transit users, motorists and persons of all ages and abilities."

Chapter Two:
Description of Proposed Action

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2.0 Description of the Proposed Action

2.1 Introduction

The Proposed Action is the implementation of a Transit-Oriented Development (TOD) Plan for the Kaka`ako Community Development District (KCDD) and the Aloha Tower Special District (ATSD). This environmental impact statement (EIS) discloses the impacts that are anticipated as the result of implementing the Proposed Action.

It is important to note here that this EIS addresses two alternative visions for implementing transit-oriented development: TOD Alternative A and TOD Alternative B. <u>This EIS contains no recommendation concerning which Alternative is preferable.</u>

For the purposes of this EIS, the Proposed Action is the implementation of transit-oriented development in general, be it TOD Alternative A or Alternative B. As was briefly discussed in Chapter One, TOD Alternative A represents the Draft TOD Overlay Plan presented in Appendix A. TOD Alternative B represents a hybrid of Alternative A: it contains modifications to the urban density of the KCDD resulting from the enactment of Act 61 in April 2014, which restricted building heights in the Mauka Area to 418 feet. Rather than eliminate TOD Alternative A from further consideration because it recommends that some new buildings in the KCDD exceed a height of 418 feet, HCDA has elected to retain it for the purposes of full disclosure, as well as a "rigorous exploration" of alternatives as required by Section 11-200-17(F), Hawaii Administrative Rules. HCDA recognizes that TOD Alternative A cannot be implemented unless Act 61's height restrictions are repealed. However, for the purposes of this EIS analysis, HCDA believes that it is prudent to address a full range of alternatives.

Development within the KCDD is regulated by the HCDA pursuant to rules adopted for the Mauka Area in 2011 and the Makai Area (2005), which includes the non-contiguous ATSD, as well as the Mauka Area height limit imposed by Act 61(2014). Together, these initiatives established the desired development pattern for the KCDD. For the purposes of this EIS, the "Future Baseline" condition is what would happen in the district if it were built-out in accordance with established rules and plans. The Future Baseline Condition for the Mauka Area was fully addressed in the 2009 Final Supplemental EIS for the Kaka`ako Community Development District.

The Proposed Action is a regulatory "overlay" on the baseline. Rather than change the fundamental character already established for the KCDD, it amends it or overlays it by offering a vision of how the district could respond to the opportunities presented by the introduction of an elevated light rail system in the Mauka Area that was approved by the Honolulu City Council in 2012. The entire rail system was the

subject of a separate EIS that was approved by the Federal Transit Administration on January 18, 2011. Thus, it is important to understand that the present EIS is not intended to evaluate the impacts of the ~~HART~~ light ~~rail~~ ***metro*** system alignment through the KCDD. That has already been done. The ~~HART~~ light ~~rail~~ ***metro*** system presents certain additional urban infill development opportunities within the KCDD and it is the impact of that additional development opportunity that is being disclosed in the EIS.

To accomplish this, both TOD Alternatives create a vision for what additional development is possible, and, for the purposes of evaluation, present a target year for the full build-out of that vision: 2035. Will build-out actually occur by 2035? Probably not. Actual build-out of the Mauka Area will result from the decisions made by individual property owners and government agencies investing in infrastructure. It will also be affected by the cyclical nature of the economy, both in Hawai`i and on the mainland United States. However, to fulfill the requirement of Chapter 343, HRS that the impacts of a proposed development be disclosed as early as is practicable, the HCDA has selected the year 2035 to evaluate the impacts of full build-out for transit-oriented development. 2035 is the year that both the State of Hawai`i and the City and County of Honolulu have established as the horizon year for their long-range population forecasts. It is, therefore, a convenient year to compare the future of the KCDD with and without the changes that would be incurred with the Overlay Plan adoption. Please refer to Chapter 3 for a comparison of the KCDD in 2035 upon full build-out of the Future Baseline Condition vs. full build-out of the two Alternatives.

2.2 Objectives of Transit-Oriented Development

The goal of implementing transit-oriented development is to develop the Kaka'ako community in ways that promote the shared values of livability, environmental, social and economic sustainability and resiliency in the face of change. The result must enhance the distinct character and history of the Kaka'ako community, and contribute to the environmental, social and economic health of the region. The Proposed Action is intended to express the agency's dedication to place making through enhanced urban form and concentrating development near to infrastructure investments.

The objectives and policies outlined below are based on the "6 D's" of pedestrian focused, transit-oriented, community development:

Objective D1: Destinations – Coordinate land use and transportation

Coordinate transportation and land use by concentrating development along reasonably direct corridors, so that most destinations are '*on the way*' to other destinations. When transportation and land use are well coordinated, transit,

walking and biking can provide fast, direct and cost-effective access to more destinations.

Policy D1.1 Locate highest density of uses near high capacity, high-frequency transit, including high frequency bus and ~~HART~~ ***light metro*** stations

Policy D1.2 Sustain the district's mixed use character and encourage a mix of land uses around transit stations, near transit corridors and transfer centers to spread demand throughout the day and create an interesting and dynamic pedestrian environment.

Policy D1.3 Create quality connections between the Kaka'ako district and neighboring districts to extend the viability of active transportation choices.

Objective D2: Distance – Create a well-connected street network using Complete Streets principles

Implement complete streets policies and develop a holistic transportation system in KCDD, finding ways to maximize the capacity to move people by developing environments that encourage people to walk, bike and take transit, rather than driving for all trips. A well-connected street network shortens travel distances, making it possible for people to walk or cycle to transit service quickly and conveniently from the places they live, work, shop, and play, and to support walking and cycling as everyday transportation options. Implementation of the complete streets network will require coordination between work at street level and the need to consider upgrades to utilities to support new development.

Policy D2.1 Provide a fine-grained street network, minimizing the distances between intersections and avoiding streets that do not connect into the greater grid.

Policy D2.2 Create a multimodal mobility network, providing a continuous high quality environment that encourages active transportation and quality public spaces throughout the district.

Policy D2.3 Balance system uses by creating multimodal streets with priority for moving people rather than cars through design treatments that encourage walking, biking and taking transit.

Policy D2.4 Make walking and cycling access to frequent transit as direct as possible.

Policy D2.5 Complete streets implementation will be coordinated with the implementation of new utility infrastructure necessary to catalyze and support development.

Objective D3: Design – Create places for people

Create streets and public spaces that are carefully designed with the needs of people in mind. The public realm should be safe, comfortable, and inviting for people of all ages and abilities. To achieve these objectives, transit-oriented neighborhoods have complete streets designed to meet the needs of a range of users, and they provide inviting public spaces that welcome lingering, gathering and celebration.

Development in transit-oriented neighborhoods also reinforces the distinct history, culture, and character of Kaka`ako's neighborhoods using context-sensitive design and enhancing the pedestrian environment.

Policy D3.1 Design streets to relate to buildings in a way that creates porosity, interest, and public space opportunities

Policy D3.2 Design streets that are accessible and easily navigated by users of all abilities

Policy D 3.3 Design parking and parking access to support a pedestrian-oriented realm

Policy D3.4 Design the spaces adjacent to ~~HART~~ ***light metro*** stations and alignment through Kaka'ako in ways that maximize access and benefit to the community.

Policy D3.5 Design spaces that integrate the history, culture, and character of Kaka`ako.

Objective D4: Density – Concentrate and intensify activities near frequent transit

Encourage more intensive development near frequent transit (transit service that arrives every 15 minutes or better) to enable livable, walkable, and resilient neighborhoods. To function well, higher density development should be combined with the other principles of good transit-oriented development, creating a compact community with a connected street network, well-designed buildings and public spaces, a mix of land uses, and managed demand for private vehicle travel. In Kaka'ako, more intense land use will relieve development pressures on suburban and rural areas by attracting development to urban areas in the District that can be well served by a variety of modes.

Policy D4.1 Encourage mixed use and redevelopment along transit corridors.

Policy D4.2: Offset increased development heights with increased active public space amenities that directly benefit the building's residents and tenants.

Policy D4.3 Plan for density that supports community character and promotes quality of life

OBJECTIVE D5: Diversity – Encourage a mix of uses

Create an internally diverse and vibrant mixed-use community through the provision of a range of housing choices, services and facilities, which improve the quality of life for residents and businesses.

Policy D5.1: Provide a mix of housing types at varying densities and costs.

Policy D5.2: Preserve and enhance active public space.

PolicyD5. 3: Include a broad mix of commercial and light industrial uses that are compatible with an urban village.

Objective D6: Demand Management – Encourage the "Auto Trip Not Taken" through a systems management approach

Develop a comprehensive systems approach to parking and travel demand management. This will include developing the Kaka'ako district in a way that allows a resident of the district to meet many of their needs within the district, avoiding the need to travel longer distances for basic life needs. Combined with the emphasis on high quality, convenient, reliable and competitive transportation choices, these policies can have a wide range of positive benefits, including reducing traffic congestion and air pollution, making better use of existing capacity and infrastructure, increasing traffic safety, and improving public health.

Policy D6.1: Manage parking supply and demand consistent with the goals of reducing driving trips.

Policy D6.2 Create an environment within Kaka'ako that will enable residents to meet many of their needs within the district, reducing the need to drive outside of the district for all trips.

Policy D6.3: Ensure that all non-auto mobility choices are designed to be convenient and competitive with the auto to maximize non-auto travel.

2.3 Elements of the Proposed Action

A common misconception exists that dense, busy cities generate traffic congestion. However, many studies have shown that typical suburban housing developments are often more congested than mixed urban areas, because a higher percentage of

trips rely on automobiles, and there are comparably less route choices. In well-designed, higher density, mixed-use neighborhoods with good pedestrian, cycling, and transit access, households tend to own fewer cars and ultimately drive 20-40 percent less annual miles than the same households would in auto-dependent locations.[1] The transit-friendly land use objectives and goals as presented in Section 2.2 compel us to build differently. Mobility, access, and higher density, mixed-use urban environments can work together to support the creation of positive feedback loops. Co-locating people with their everyday needs provides incentive to walk, bike, or take transit, and drive less, eventually resulting in a compact, walkable community.[2]

Many cities throughout the U.S. are now also working on tools to better integrate mixed-incomes households into redeveloping urban areas, from experiments with mixed-income buildings in New York City, to inclusive zoning ordinances in Honolulu, and affordability requirements in San Francisco.[3] The Proposed Action also supports this effort by bolstering the residential component already defined in the Mauka Area Plan under the Future Baseline Condition and increasing overall capacity. A supply-side solution in the form of providing additional incentive for developing affordable housing needs to be reinforced with regulatory policies that ensure the long-term tenure of those affordable units. It is with this question in mind that the HCDA developed a vision to add additional capacity to the Kaka`ako district.

Both TOD Alternative A and TOD Alternative B increase the overall quantity of housing as compared to the Future Baseline Condition and introduce new opportunities for area land uses such as a limited number of hotels and office/industrial buildings. Under the Proposed Action's policies increases in land use capacity are only allowed if tethered to new community amenities and public realm enhancements, which are elements that support urban lifestyles. The Proposed Action does not articulate a precise standard for density bonuses in exchange for community amenities, but assumes that it is an issue that will be taken on during plan implementation.

The Proposed Action asserts that strong land use and transit-planning partnerships can lay the groundwork to develop livable neighborhoods, improve public health, lower vehicle miles traveled (VMT), and reduce greenhouse gas (GHG) emissions, all

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1 G.B. Arrington and Kimi Iboshi Sloop (2010), "New Transit Cooperative Research Program Research Confirms Transit-Oriented Developments Produce Fewer Auto Trips," ITE Journal (www.ite.org) Vol 79 No. 6 June, pp. 26-29.

2 Todd Litman (2011), "Land Use Impacts on Travel: Current State of Knowledge," Planetizen (http://www.planetizen.com/node/50451).

3 Satow, Julie "Affordable Housing in New York's Luxury Buildings" New York Times 8/29/14. Page viewed: http://www.nytimes.com/2014/08/31/realestate/affordable-housing-in-new-yorks-luxury-buildings.html?_r=0

while increasing social capital. When the public sector provides opportunity for more growth, the private sector responds by investing in the neighborhood amenity.

The Proposed Action treats questions of parking and mobility as critical to resolving questions about the future development of Kaka`ako. We know that building parking is expensive; it takes up space which otherwise could be used for housing or other active uses and impacts the quality of the public realm. The Proposed Action explores a future of Kaka`ako that moves away from each single use parking space, each person requiring free storage for their vehicle at the beginning and end of each trip, and instead, envisions a district-wide parking management scenario. This will enable a move towards a more balanced mix of mobility options, relying first of the completion of the ~~HART train~~ ***light metro rail***, but also by tapping into private sector investments to complete the street grid, create a bicycle network, provide shared parking districts, and improve the condition of public sidewalks and parks.

The following section describes two scenarios envisioned for the Proposed Action – whose primary distinction is in the height of allowable structures, and resulting capacity.

1) TOD Alternative A introduces significant height and tall residential towers to accommodate capacity increases. In this Alternative, building forms could rise to 700' in a total of three instances, with options for a cluster of 420-550' tall high-rise towers.

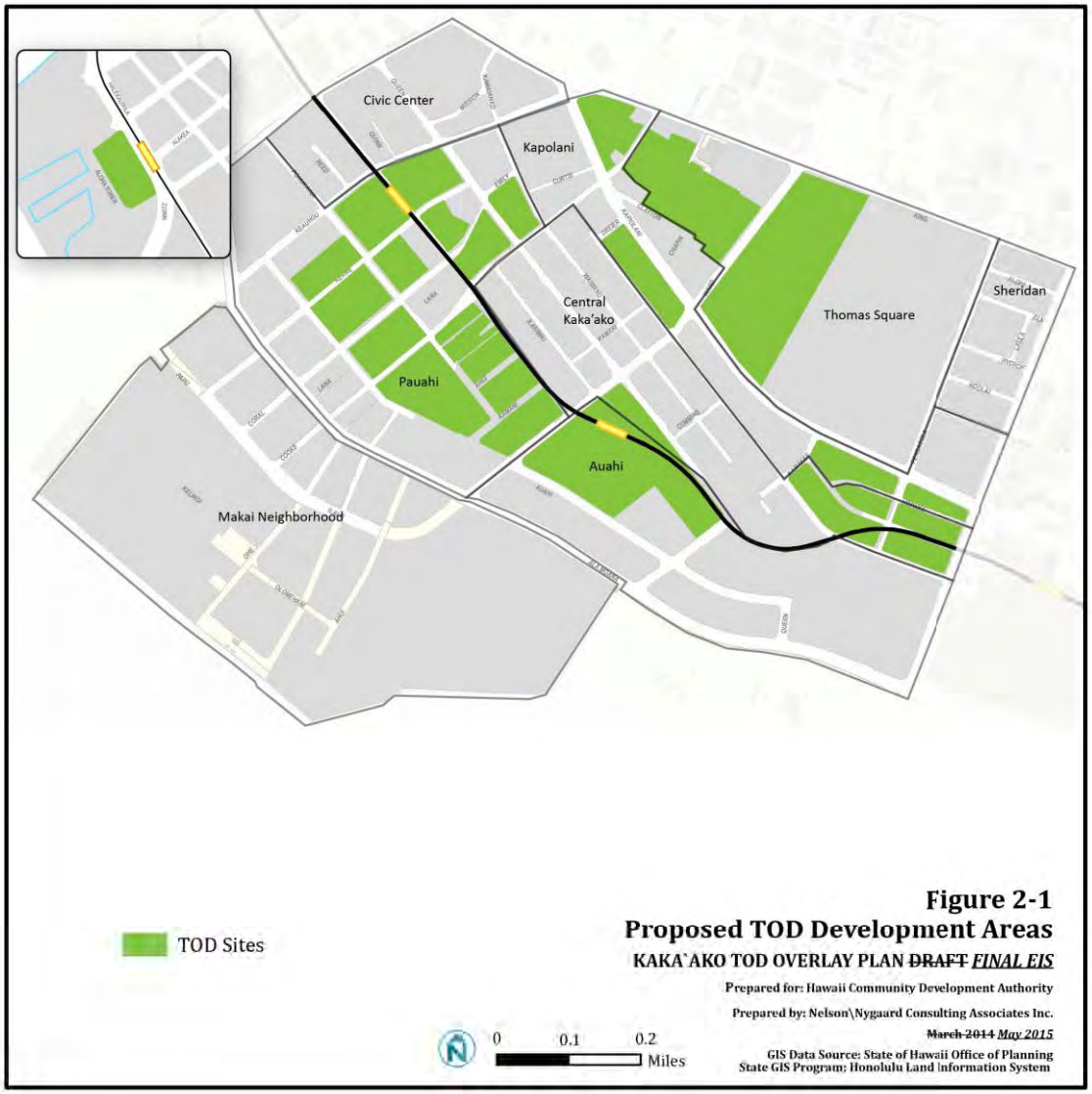
2) TOD Alternative B explores how redevelopment might occur with a similar, but slightly reduced increase in capacity while maintaining the existing envelope of 418' height limitations, pursuant to Act 61. Alternative B was developed to maximize density within the District, taking into account the height limitation imposed by Act 61 and without compromising desirable urban design and aesthetic character.

2.3.1 Neighborhood Character

Under the Proposed Action, the Mauka Area will continue its planned transformation towards a truly urban, high-rise, 24-hour, mixed-use neighborhood. Either of the TOD Alternatives will increase overall development capacity in selected neighborhoods within the Mauka Area (see Figure 2-1). No capacity or rule changes are proposed in the Makai Area, or for mature, and built-out existing neighborhoods (Sheridan, Civic Center and portions of Central Kaka`ako) outside of the TOD Overlay area.

In most areas, it is assumed that increased capacity in TOD Alternatives A and B come with public infrastructure improvements that will support healthy neighborhoods. These improvements will focus on the implementation of a Complete Streets program and enhancing the public realm with provisions for public parks, multi-modal transportation opportunities, and shared parking.

Figure 2-1: Proposed TOD Development Areas



Following is a description of redevelopment associated for each of the neighborhoods included in the KCDD.

Civic Center – This area is generally not eligible to participate in the Proposed Action, and consequently there are no increases in development capacity beyond the Future Baseline Condition, with limited changes occurring in this neighborhood. Many properties will likely remain in their current condition.

Thomas Square District – Redevelopment in this district is focused on two sites for civic, residential and commercial uses, Blaisdell Center and the HECO property (with

the remainder of the area generally built-out). The McKinley High School property is assumed to continue in its existing condition, as well as conditions along King Street.

The Proposed Action explores the possibility of residential and mixed uses on these two potential development sites to support civic improvements. In contrast to the Future Baseline Condition, both Alternatives directly boost pedestrian and vehicular street connections, and create new open spaces and parks.

Under both Alternatives, the Blaisdell and HECO properties are assumed to redevelop at a total FAR of 6.5.[4] However in TOD Alternative A, a much increased height limit allows for a smaller building footprints creating an opportunity for more public realm enhancements at ground level.

TOD Alternative A: To take full advantage of the Blaisdell site and tall height allowances, including one dramatic and iconic 700' tower, this Alternative could potentially support:

- The extension of Thomas Square Park across King Street and replace the area now generally occupied by the Concert Hall and parking structure;
- A re-designed state-of-the-art performance center;
- An enlarged sports arena;
- A mixed-use entertainment center;
- Options for a tall, iconic mixed use residential tower;
- Opportunities for additional Affordable Housing;
- A business-oriented hotel to meet the demand for visitors coming to Honolulu's downtown for business purposes;
- A site design based on pedestrian access;
- A completed street grid with improved vehicular connections in both `Ewa-Diamond Head and Mauka-Makai directions across the property;
- A coordinated mobility and access strategy with shared parking arrangements;
- Provisions to encourage people to arrive at the site using all modes of transportation, including transit, walking and cycling; and
- Sustainable building design and green building techniques.

TOD Alternative A also envisions a wholesale redevelopment of the HECO site with a cluster of high rise residential and mixed-use buildings, providing opportunities for a centralized pedestrian movements, park space, and an improved circulation network completing the street grid. This would change the character from a mixed employment area by increasing housing opportunities to augment the King Street

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[4] Floor Area Ratio (FAR) is a mechanism used by municipal governments to control or regulate the amount of development on a particular property. For example, a 50,000 square foot property with an FAR of 2.0 would be allowed to have a total of 100,000 square feet of development, distributed among as many floors as the height limit would allow.

corridor, the Queens Medical Center complex, the Arts District, and Downtown Honolulu.

TOD Alternative B: This Alternative reduces site capacity on redevelopment parcels as compared to TOD Alternative A. At the Blaisdell Center, TOD Alternative B envisions a redeveloped performing arts center, including a sports arena, and explores the addition of high-rise residential uses, and a hotel to the site. In comparison to TOD Alternative A, this alternative reduces overall development capacity while creating additional open space on the makai side of King Street that can enhance the existing open space by Thomas Square park. The HECO parcel is a similar intensity as the TOD A, but retains 400' height limits, necessitating some larger building floor plates.

Sheridan Neighborhood – No increases in development capacity or change to neighborhood character.

Auahi Neighborhood - All of the block areas in Auahi are within the 5- to 10-minute walking radius of the proposed Kaka`ako ~~HART~~ ***light metro*** station. The Ward Neighborhood Master Plan comprises a large portion of the Auahi Neighborhood, and select portions of the Master Plan were studied in the TOD Overlay Plan as eligible sites for additional residential high-rise capacity. **–** ~~specifically Land Block 1 and Land Block 5~~. (No capacity changes are proposed to the form of development between Auahi St. and Ala Moana Boulevard in order to accommodate the Ala Moana Special Review District – Ward Neighborhood Master Plan's Land Blocks 2, 3, and 4.)

The Master Plan as currently entitled constitutes the Future Baseline Condition and is presently in phase one of its development program. The Ward Neighborhood Master Plan envisions a visually rich, stimulating, and activated retail environment, with a large central park area offset with high-rise residential buildings throughout the site and structured parking that is screened from the street. The Proposed Action looks to encourage additional crossings of Ala Moana Boulevard as well as integration of the public realm associated with the Kaka`ako ~~HART~~ ***light metro*** station.

TOD Alternative A: This Alternative supplements the vision for the existing Ward Neighborhood Master Plan to accommodate significant increased capacity associated with the potential for tall towers (above 400'), as well as increased frequency of towers. In this scenario, a dramatic skyline would include one 700' Iconic Tower as well as four towers reaching up to 550'. These towers would provide the opportunity for a new visionary transportation and employment hub in Honolulu (ultimately resulting in a revised vision for the area). To achieve this program, the area would likely rely upon progressive parking strategies such as a district–wide, shared parking and implementation of Transportation Demand Management strategies ***(see page 8-14 of Appendix A for extensive discussion of TDM strategies)***. The area would be busy, pedestrian filled, with new retail space,

homes, and employment opportunities. TOD Alternative A also envisions hotel use as an allowable use in this neighborhood within the TOD designated land parcels.

It is beyond the scope of the Proposed Action to redesign in detail this area to accommodate additional growth, but it can be assumed that additional public activated open space would be included beyond that which is currently planned at the ground level.

TOD Alternative B: This Alternative supplements the Future Baseline Condition with increased frequency of towers, and some taller heights on already planned buildings (subject to the height limitations imposed by Act 61) – however the main characteristics of the Ward Neighborhood Master Plan program would remain in place. The Alternative explores opportunities in later phases of development, particularly in land block 5b (to the Ewa of Ward Avenue). No additional open space is envisioned at the ground level on the site. TOD Alternative B maintains the retail, mixed character as envisioned in the Ward Area Master Plan with a boost in intensity. Wide sidewalks and a central open space create a busy, pedestrian-oriented area with retail and residential buildings as well as some employment. TOD Alternative B also envisions hotel use as an allowable use in this neighborhood within the TOD designated land parcels.

Similar to TOD Alternative A, under TOD Alternative B the expectation for progressive parking approaches would still be in place, e.g. shared parking, district wide parking, charging separately for parking spaces from a residential unit, and other Transportation Demand Management measures.

Pauahi Neighborhood - The Pauahi area has been determined as a prime candidate for transit-oriented development. This neighborhood contains a portion of the Kamehameha Schools Master Plan area (Blocks A, B C, and D). No changes are proposed to the capacity or form of development between Auahi St. and Ala Moana Boulevard.

In both Alternatives, the Pauahi Neighborhood transforms to a high-rise residential neighborhood, with structured parking within block size redevelopment projects. Buildings at the ground level seek to be better anchored to the street not only with retail uses, such as along Auahi Street, but also with residential uses such as townhome projects and ground-oriented units that may accommodate larger families. While projects explored in both Alternatives consolidate development sites to show the most potential for capacity, it is likely that some older buildings would remain.

TOD Alternative A: Increased capacity is due to increased building height and frequency of towers associated with Kamehameha Schools Master Plan area on all blocks within the Master Plan area, as well as individual TOD redevelopment sites. Individual development sites have been estimated at a range between 8.5 up to 10 FAR. Additionally, the State-owned 690 Pohukaina site is located in this district, and

envisioned for the purpose of this analysis to include either a dramatic, high-rise tower of 650' at 8.5 FAR, or two smaller towers at approximately 400' each.

Under this scenario, up to five towers over 400' (430-550') could be developed within the Pauahi Neighborhood on individual parcels (outside of Kamehameha Schools properties). Improvements to the street network are planned as part of TOD infrastructure improvements, with additional vehicular and pedestrian connections on most consolidated development sites. Additionally, improvements to the public realm would include small scale, neighborhood level public parks and plazas associated with individual redevelopment sites.

TOD Alternative B: This Alternative shows reduced capacity compared with TOD Alternative A with a maximum FAR of 9 and 418' height limitations. In this scenario, Kamehameha Schools' blocks A and D are envisioned with increased capacity in the form of added residential height (but not to exceed 418').

Privately owned parcels near the Civic Center ~~HART~~ ***light metro*** station were assumed to be consolidated, as their proximity and current use as parking lots represent a good opportunity for TOD. Instead of single tall tower development form envisioned in TOD Alternative A at 690 Pohukaina Street, the site accommodates a two-tower form at a reduced height. The opportunity for improved circulation with new pedestrian and vehicular connections is also present. Plans for parks and other public realm improvements would be included with TOD Overlay redevelopment sites.

**Kapi`olani Neighborhood** - The Kapi`olani corridor has an existing pattern of high rise residential mixed with office uses and much is already constructed at a high capacity. A moderate amount of changes are assumed in this neighborhood with the completion of several more office or residential buildings. The TOD Alternatives explore redevelopment at 8.5 FAR, including both office and high-rise residential development. There is a minor reduction estimated for retail and civic uses as compared to the Future Baseline Condition.

Kapi'olani will continue to be an attractive alternative for office uses outside of downtown, due to its nearby access to light rail.

The Proposed Action may provide new tools and strategies to reduce the amount of parking expected by employers, thereby reducing the overall bulk and mass of structured parking areas.

Central Kaka`ako** - Only the portions of Central Kaka`ako impacted by the ~~HART~~ ***light metro* alignment are eligible to participate in the Proposed Action (on the Diamond Head side of the District). Under both Alternatives, these selected parcels are assumed to consolidate and redevelop at FARs ranging from 7.1 - 8.5 FAR. These areas are assumed to redevelop as high-rise residential building types resulting in a net increase of residential uses associated with an increased tower frequency and

requisite height limitations. Additional activated park spaces are envisioned as associated with the ~~HART rail~~ ***light metro*** alignment, including improvements to circulation, temporary uses, and street level activation.

Within the Central Kaka`ako Neighborhood, land parcels not eligible for transit-oriented development under the Future Baseline Condition may redevelop to 3.5 FAR only when infrastructure is sufficient, including improvements to utilities and sidewalks. The overall redevelopment of the Mauka Area will likely increase development pressure here, and the share of small businesses relying on access to low-cost space will likely decrease.

Makai Area - This area presently allows only commercial uses. No density increases associated with Proposed Action have been proposed. The TOD Alternatives estimate a very general potential build-out under the existing planning parameters for the purposes of a broader analysis. Changes associated with the Makai Area may include the potential for shared parking arrangements and improved crossings into the Makai District across Ala Moana Boulevard. Opportunities occur to include makai-based improvements as part of private sector development mitigations in Kaka`ako's Mauka Area under the Proposed Action.

Aloha Tower Special District - The HECO substation parcel adjacent to the ~~HART~~ ***light metro*** Downtown Station is particularly well positioned for TOD redevelopment for a range of uses, as it enjoys waterfront views and proximity to Downtown. Under both Alternatives, this site would be able to develop using an increase in capacity (9.7 FAR) with more flexibility in off-street parking requirements. This vision is coordinated with the City and County of Honolulu Neighborhood Transit-Oriented Development Plan[5] that envisions the area as a mixed-use, high intensity district appropriate and recognizes the opportunity for revitalizing the HECO substation complex into a citywide destination and community-gathering place. Both Alternatives envision hotel use as an allowable land use on this parcel.

2.3.2 Land Uses

As an urban region, the Mauka Area will have a mix of uses with opportunities for diverse residential and mixed-use commercial buildings in proximity to transit stations. The Proposed Action emphasizes residential use, which would account for nearly 75 percent of developable land uses in the Mauka Area (exclusive of parking). Both Alternatives will increase overall development capacity within selected neighborhoods of the Mauka Area to permit more people to locate in close proximity to the ~~HART rapid transit~~ ***light metro*** system, which will in turn:

- Reduce household costs associated with storing automobiles and driving;

[5] Downtown Neighborhood Transit-Oriented Development Plan Public Review Draft, City County of Honolulu, p 4-3

- Increase the potential for Reserved Housing
- Concentrate activities where there is the greatest level of accessibility;
- Minimize island-wide development pressure on rural areas, which will in turn help preserve O`ahu's natural resources; and
- Anticipate a variety of building types to meet the needs of a variety of income levels at different life stages.

Land uses presented in the TOD Alternatives include allocations for Residential, Office, Retail and Industrial. Hotels are included on three sites within the Mauka Area.

Although most of the properties within the KCDD Mauka Area are within a quarter to half mile walking distance from a future ~~HART rail~~ ***light metro*** station, not all areas of the District will experience significant land use changes. In fact, within the Mauka Area, only 25 of the 73 Mauka block areas show increased land use capacity. These increased-density blocks consist of 219 acres or about half of the total Mauka Area.

The Proposed Action consolidates growth into the core area, while maintaining existing neighborhoods (e.g., a building currently limited to a low-rise will not become eligible for a high-rise structure), public parks, and major public assets to ensure continuity and longevity for users. As such, either TOD Alternative will have limited impact on the following Mauka Area locations:

- The existing low-scale residential character of Sheridan Neighborhood;
- The majority of Central Kaka`ako identified as low-rise industrial and service business areas;
- The Civic Center which contains major historic sites and civic structures; and
- The Ala Moana Special District Review Area, the one block- wide strip along Ala Moana Boulevard that maintains Mauka Area Rule limitation on building heights and density.

One possible scenario for the distribution of development capacity is depicted in Table 2-1 and Table 2-2, based on each of the neighborhoods that comprise the area.

Table 2-1: Development Capacity in TOD Alternative A

TOD Alternative A	Total	Total
	Non Residential SF	Residential SF
Percent of Total	27%	73%
Kaka'ako Total	14,890,939	41,093,384
Mauka Area	11,839,961	40,756,616
Makai Area	2,533,538	0
Aloha Tower Special District	517,440	336,768

TOD Total SF	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM SF	Community Center SF
Kaka'ako Total	28,968	1,000	41,093,384	482,735	1,766,348	6,687,334	3,635,706	1,730,780	544,838	43,198
General Area										
Mauka	28,765	628	40,756,616	307,735	1,339,653	5,294,343	3,270,950	1,627,280		
Makai					426,695	1,112,191	303,116	103,500	544,838	43,198
Aloha Tower SD	202	372	336,768	175,000		280,800	61,640			
Neighborhood										
Pauahi	9,218		13,702,995		947	2,112,188	1,145,280	573,460		
Auahi	7,094	195	9,815,417	103,735		854,984	963,961	294,766		
Central Kaka'ako	2,685		3,932,045		234,741	638,184	185,092	680,684		
Civic	688		1,038,377		405,526	118,792	134,797	6,650		
Kapiʻolani	5,067		5,899,538		41,898	1,209,260	352,932	71,720		
Sheridan	436		724,495		73,871	39,561	10,078			
Thomas Square	3,578	434	5,643,749	204,000	582,670	321,374	478,810			
Makai					426,695	1,112,191	303,116	103,500	544,838	43,198
Aloha Tower SD	202	372	336,768	175,000		280,800	61,640			

Table 2-2: Development Capacity in TOD Alternative B

TOD Alternative B	Total	Total
	Non Residential SF	Residential SF
Percent of Total	28%	72%
Kaka'ako Total	14,465,206	37,639,258
Mauka Area	11,414,228	37,639,258
Makai Area	2,533,538	0
Aloha Tower Special District	517,440	336,768

TOD Total SF	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM SF	Community Center SF
Kaka'ako Total	26,588	1,044	37,639,258	547,949	1,766,348	6,484,283	3,369,026	1,709,565	544,838	43,198
General Area										
Mauka	26,386	672	37,302,490	372,949	1,339,653	5,091,292	3,004,270	1,606,065		
Makai					426,695	1,112,191	303,116	103,500	544,838	43,198
Aloha Tower SD	202	372	336,768	175,000		280,800	61,640			
Neighborhood										
Pauahi	8,470		12,828,493		947	1,902,790	997,811	552,245		
Auahi	5,871	317	7,778,799	168,949		854,984	963,961	294,766		
Central Kaka'ako	2,685		3,932,045		234,741	638,184	185,092	680,684		
Civic	688		1,038,377		405,526	118,792	134,797	6,650		
Kapi'olani	5,067		5,899,538		41,898	1,209,260	352,932	71,720		
Sheridan	436		724,495		73,871	39,561	10,078			
Thomas Square	3,170	356	5,100,744	204,000	582,670	327,721	359,598			
Makai					426,695	1,112,191	303,116	103,500	544,838	43,198
Aloha Tower SD	202	372	336,768	175,000		280,800	61,640			

2.3.2.1 Hotels and Tourism

Consistent with the City & County of Honolulu's Primary Urban Center Development Plan, it is HCDA's opinion that there is demand for hotels within the Kaka`ako area,

particularly to meet business traveler needs. Both Alternatives include provisions to allow hotels at three locations in proximity to the district transit stations (Auahi, Blaisdell Center, and Aloha Tower Special District). This use is estimated to total approximately 1,044 potential rooms.

For the purposes of this analysis, hotels under consideration include full service, business, and condo-hotels for travelers seeking to stay outside of the tourist districts. A Kaka`ako hotel will be a transit ride from the airport and will be highly accessible for meetings and work engagements at Civic Center, the commercial core, or the convention center. Regulatory limitations on the size and total amount of hotels are included in TOD Plan Policies.

2.3.2.2 Office

In Honolulu's urban core, limited remaining land parcels for office development, combined with the higher net return to developers from high-rise residential uses may curtail the level of commercial development in Kaka`ako.[6] Changes proposed in the Proposed Action include an option for larger floor plate office buildings (maximum 28,000 SF per floor with height limitations of 160'). This is considered desirable for corporate tenants.

In both Alternatives, high-rise commercial is generally assumed to be located along Kapi`olani Boulevard, and in close proximity to Civic Center Station. Office uses do not increase between the Baseline Condition and the TOD Alternatives. The TOD Alternatives actually anticipate a modest decrease in office uses in the KCDD due to a lack of available sites and existing economic conditions that support residential development.

2.3.2.3 Retail/Commercial/Professional Services

Kaka`ako is transitioning to become a mixed-use, 24-hour neighborhood that can better compete in terms of desirability with residential locations outside the City's core, and with existing retail environments such as Ala Moana Center. In order to retain and attract new residents and businesses, the Proposed Action's policies encourage neighborhoods focused on creating places for people – from small shops to a full-service grocery store, and from cultural amenities to medical services and day care. In particular, the TOD Alternatives promote land uses that encourage transit use throughout the day (peak period, mid-day, nighttime, and weekends) to encourage "round the clock" activity in and around transit stations.

The total amount of Commercial/Retail uses is assumed to remain relatively stable between Alternatives and the Future Baseline Condition; however this represents a significant increase over existing conditions. Retail uses are assumed to be located

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6 Colliers Monroe Friedlander Consulting, City and County of Honolulu General Plan Update Commercial Real Estate Market Trends Report, 2010, p 10.

at street level with Auahi Street as a major retail street. Other commercial uses such as professional services may locate in upper stories or will be vertically mixed within projects throughout the district. There are no restrictions currently proposed on the type, and size of retail uses within the district under the Proposed Action.

2.3.2.4 Industrial

Industrial uses in the Proposed Action are assumed to continue existing trends in the Kaka`ako area that include continued gentrification of existing urban industrial properties, near-term and mid-term ground lease expiration, rising industrial land cost and rental rates, and movement towards West O`ahu industrial park developments.[7] In the KCDD, HCDA has provided an incentive towards industrial uses in both the Ward and Kamehameha Schools Master Plans. As such, the Alternatives assume a minimal increase of 87,000 SF over the Future Baseline Condition associated with the general capacity increases in these two areas.

The types of industrial use acknowledge a trend towards diversification, including buildings that may mix office uses with light industrial, creative research, and development intensive services. These uses may occur in vertical, multi-tenanted structures with a higher number of workers per square foot. These structures are assumed to be compatible with residential and other commercial and entertainment uses and take advantage of proximity to transit.

2.3.2.5 Civic

The Proposed Action explores the potential expansion of Thomas Square Historic Park as associated with the redevelopment of the Blaisdell Center performing arts center and arena. Both Alternatives include the provision of a new public plaza, pedestrian connections and public uses – such as a performing arts center and sports arena on the Blaisdell Center property.

However, the allocation of an expanded park on the Blaisdell site would be possible only with participation of the City and County of Honolulu (the landowner) and other state and county agencies, and with the inclusion of enough revenue generating uses to cover the associated costs. At this stage in other neighborhood areas within the Mauka Area, civic uses have generally not been differentiated from other types of commercial or entertainment uses.

2.3.2.6 Residential

The TOD Alternatives both include significant increases in residential development. Overlaying transit-oriented development on the KCDD Mauka Area provides an opportunity to revisit the existing Reserved Housing Policy defined in the Hawaii

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7 Ibid. p 10

Revise Statues (Chapter 217). The following summarizes HCDA's plans to provide affordable housing as part of the TOD Overlay Plan:

- Residential Projects that include residential units of 10 or more must provide at least 20% of the residential units as reserved housing units.
- Hotels and other commercial development shall have the requirement to provide reserved housing. The HCDA will develop a formula for the number of units to be provided.
- The reserved housing price shall be based on area median income of 80-140%. The HCDA shall develop a formula for what percentages of the reserved housing units are provided at what AMI level.
- As much as feasible, the HCDA will couple the reserved housing requirement with incentive-based zoning. The number of reserved housing units required for a particular project should in in line with the incentive provided for the project.
- The developer must sell the units, priced between 80-140 percent of AMI, to qualified buyers with deeded covenants in favor of HCDA that include a buy-back provision for every successive future sale of the unit, and in the event that the HCDA waves its right to buy-back, a perpetual equity sharing provision.
- The buy-back price shall be based on the original purchase price, inflated by an appropriate index plus owner-paid unit improvements; or indexed to the AMI at the time of resale, whichever is lower.
- A reserved housing buyer shall set an equity-sharing percentage at the time of the original purchase. HCDA's share of the equity upon resale will be transferred to the HCDA's Reserved Housing Sub-Account in the event that HCDA waves its right to buy back the unit.

The developer may also choose to develop rental units, in which case the reserved housing units shall be rented to tenants qualified between 80 to 100 percent of AMI. Such rental units shall remain as reserved housing for a period of 30 years. The developer will be responsible for managing such units. After the regulated period the reserved housing units may be sold with HCDA or a successor agency having the first option to purchase.

Jointly this program, along with the ongoing efforts by the State of Hawaii Housing and Finance Development Corporation (HHFDC) that enable affordable housing in the KCDD, aims towards income diversity and workforce housing availability. HCDA has broad discretion and control to influence the type of units available as reserved housing to accommodate identified neighborhood needs, including larger family units.

TOD Alternative A envisions an approximate 37% increase in total residential SF over the Future Baseline Condition. This increase can be attributed to greater allowable capacity on TOD eligible sites (up to 10 FAR in Pauahi and Auahi), and

taller allowable heights. This Alternative assumes a possible increase of up to 7,822 housing units.

TOD Alternative B would result in an approximate 25.7% increase in overall residential units from the Future Baseline Condition, equaling approximately 5,443 units.

2.3.2.7 Parks and Open Space

Both Alternatives maintain all existing parks and existing and already negotiated open spaces a part of already improved developments, and in addition, will create opportunities for activated public realm associated with new street level connections, plazas and potential civic uses. An estimated 7% net area is proposed for building amenity spaces to be used by building tenants. This requirement does not penalize developers for choosing smaller unit sizes and is comparable to 55 SF per unit required under the existing Mauka Area Rules.

The following strategies are proposed towards meeting the goal of an active livable community within Kaka`ako, including a variety of multi-purpose active open spaces.

- An incentive program will provide for correlating the allocation of activated spaces for additional height and capacity. Spaces may be allocated on site, for example on green roofs as well as contribute to a dedicated in-lieu program to further develop planned parks and open spaces. This encourages private investment in open space and recreational facilities.
- Both the Alternatives explore the ability to allocate a large park space located on a redeveloped Blaisdell Center Site, and a redeveloped HECO site, both in the Thomas Square Neighborhood.
- The Proposed Action guides HCDA in the integration of a new transit plaza associated with the Civic Center Station.
- Green connections and mid-block paths are associated with redevelopment of consolidated parcels under both Alternatives.
- The Proposed Action directs HCDA to tie a minimum of fee ($ per SF) or per FAR to public active space. A tiered program may be proposed for each neighborhood prioritizing needed amenity.

Under both Alternatives, the majority of new public useable open spaces will be built as part of redevelopment projects. These spaces will be found not only in civic-scaled public parks, but also in small pocket parks on streets (promenades), semi-public courtyards, publically accessible interior spaces, public viewing plazas, and community gardens. Public spaces that are developed concurrently with individual sites may have full or partial public access (such as a grade-level or elevated courtyard, residential stoops, or gardens), and may be either publically or privately owned. In all instances, public spaces must be usable, neighborly, and provide for multiple functions where feasible.

2.3.3 Mauka Development Parameters

The TOD Alternatives test the results of new FAR and height limitations, and the application of very general design standards, focusing on those blocks that are most likely to redevelop. (Not all sites, particularly those with existing major projects, unconsolidated land ownership, or currently entitled buildings are assumed to redevelop under the Proposed Action.) The Future Baseline Condition allows properties in the Mauka Area to develop to a maximum floor area ratio (FAR) of 3.5, exclusive of parking, (an additional 1.5 to 2 FAR can be assumed for parking).

Under the Proposed Action, the intention for including parking into capacity controls (FAR) is to encourage efficient use of space allocated to parking. The TOD Alternatives establish a new maximum target FAR, inclusive of parking by neighborhood zone, in the range of 6.5 up to 10.0 FAR. Planning-level assumptions for gross SF of land use and parking capacity developed in various 3D modeling programs provided a basis for analysis. However, redevelopment may take place at a variety of different scales.

It should be noted that a slightly different process was used to create capacity estimates in Ward Neighborhood Master Plan and Kamehameha Schools Master Plan Areas. TOD Alternatives explored height increases to mid- and high-rise residential buildings in coordination with the entitled master plan allowances. This estimate is used to understand the impacts for a moderate (TOD Alternative B) to a significant amount (TOD Alternative A) of additional growth beyond the existing Master Plan. Neighborhood height increases for TOD Alternative A are summarized on the following map in Figure 2-2. Under TOD Alternative B, height increases would be limited to 418 feet. (See Section 2.3.5 below for a more detailed discussion of building heights.)

The **TOD Alternative A** "as of right" capacity is 5.0 FAR <u>including all floor area associated with parking</u>. The maximum proposed FARs in tested sites range from 7 FAR to a maximum of 10 FAR. With a potential for increased development capacity, this Alternative anticipates a redevelopment pattern that, depending on the size of the parcel, can accommodate multiple, inter-related buildings on a single development block. (See Figure 2-3)

Figure 2-2: Distribution of Building Heights – TOD Alternative A

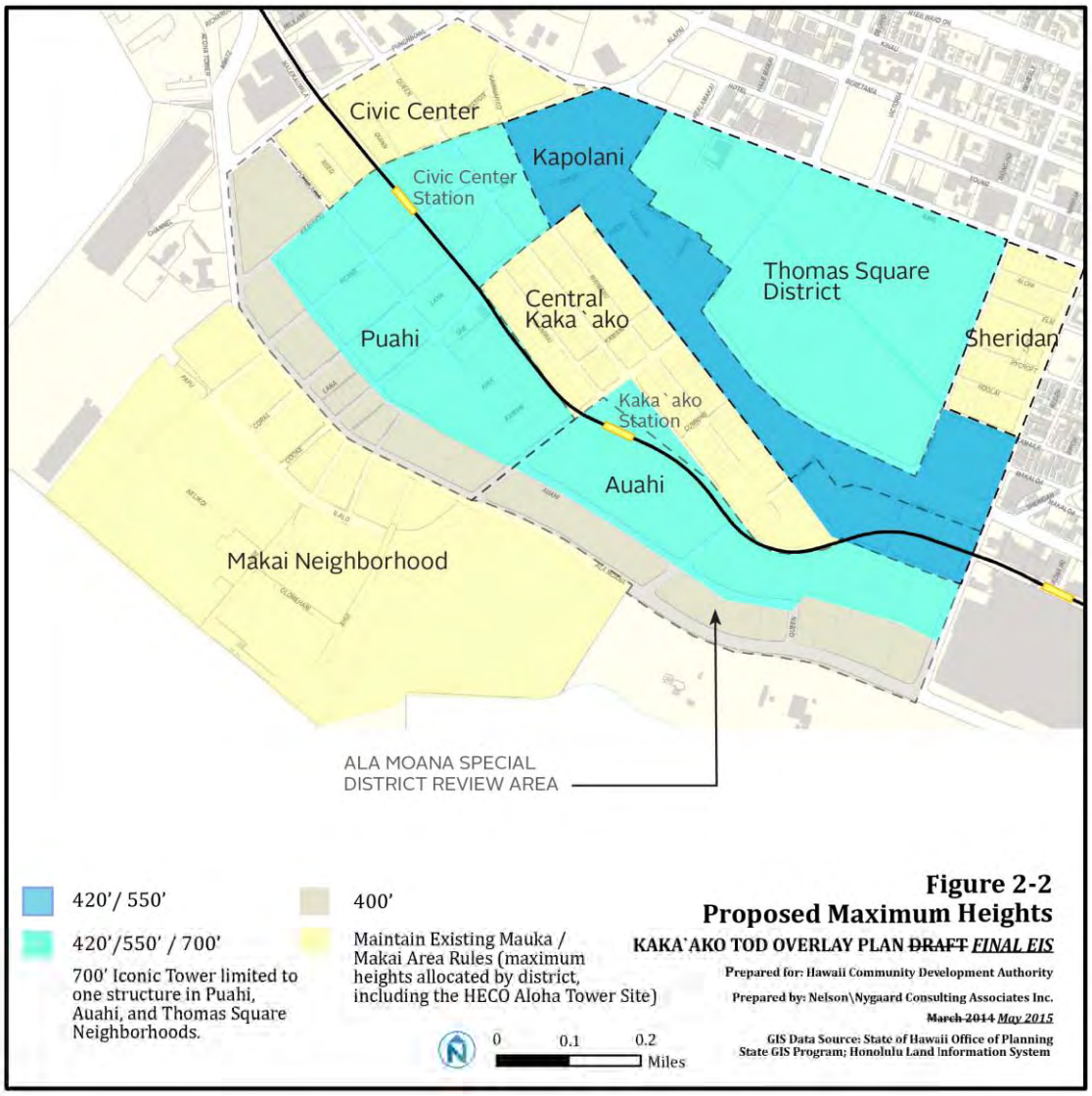
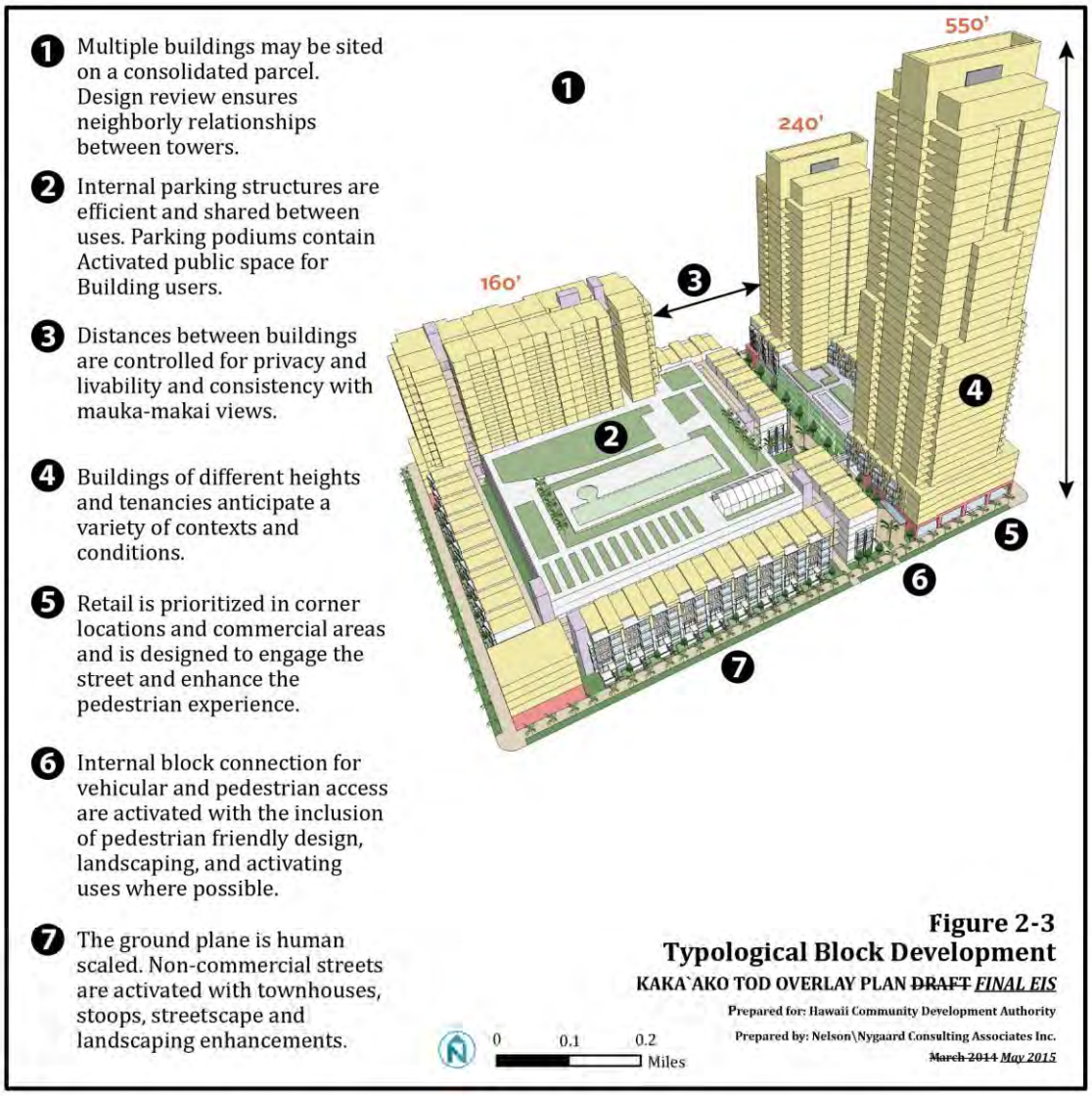


Figure 2-3: Typological Block Development



The **TOD Alternative B** "as of right" capacity is 5.0 FAR including all floor area associated with parking. The maximum proposed FARs in tested sites range from 7 FAR to a maximum of 9 FAR. The capacity is slightly reduced to a maximum of FAR 9 in Auahi and Pauahi with all else holding equal.

In both Alternatives, an incentive zoning method is proposed as a future implementation tool to achieve bonuses beyond the "as of right" development allowances. In an incentive zoning method, developers provide amenities (or payments allocated towards those amenities) in exchange for development rights.

With more intensive use of property there are greater profits. As a trade-off for a greater intensity of use, the land developer is asked to contribute to enhanced public realm, cultural amenity and/or street connectivity. Adequate profitability is also required of private developers and their investors to ensure that rezoning efforts do not simply elevate land values. Incentive zoning programs must be carefully managed to ensure that the value of the community amenity is proportional and outweighs any adverse effects caused by additional building bulk. The specific parameters of the incentive zoning method are, however, beyond the scope of this EIS and will be addressed during rule making by the HCDA.

2.3.4 Urban Design

Using basic design parameters, both TOD Alternatives include an Urban Design Framework that adjusts the urban form provisions as identified in the Mauka Area Plan to accommodate increased density and heights. The Urban Design Framework is also supported by considerations regarding mobility and access, including attributes of street design, parking requirements, public realm and activation, as well as attention to integrating ~~HART~~ ***light metro*** stations into the neighborhoods.

Urban Design strategies as outlined in the Proposed Action are intended to:

- ensure appropriate building siting and view preservation in the district;
- activate the streets and ground plane including a set of "typed streets" and secondary access lanes for improved connections that build on the Mauka Area Plan and Rules;
- create an alternative to most residential areas of O`ahu, that being a high rise neighborhood with a variety of development types;
- ensure adequate sunlight, views and public active space for a livable neighborhood; and
- create a flexible, form-based framework for redevelopment.

To understand how a general height increase would impact the area, the Alternatives test a diversity of high-rise types and a hierarchy of building form as described in Section 2.3.5 below.

2.3.5 Building Height

The Proposed Action's policies seek to encourage exemplary buildings and advance the development of well-sited, tall, slender towers. When planned well, high-rise residential neighborhoods create a skyline of framed views through and between towers, as well as green spaces on podiums that will enhance views down from neighboring buildings and residential areas on the slopes of Punchbowl, Pauoa, and to a lesser extent, Makiki. A sensitive application of height paired with quality streetscape design can produce the characteristics of a comfortable pedestrian-oriented environment on the ground plane, while adding to the overall capacity in Honolulu's Primary Urban Center.

Building height also has economic impacts. For example, it can offset costs associated with more slender buildings, and allocation of space at the ground level.

Due to parking structures typically required above grade, the scale and mass of building bases will be similar in both Alternatives and the amount of parking required for the development can act as a de-facto limitation on total site capacity. However, with the assumed implementation of the Proposed Action's mobility, circulation and access strategies, a drop in the ratio of parking spaces desired per unit may be palatable to developers and people choosing to live in Kaka'ako.

The Future Baseline Condition allows three levels of building height in the Mauka Area:

- A maximum of 65 feet for Street-Front buildings;
- A range of 80 to 215 feet for Mid-Height buildings impacting view planes; and,
- A maximum of 400 feet for any Towers taller than Mid-Height buildings.

In the Makai Area, the Future Baseline Condition allows building heights generally to 200 feet. Under the Future Baseline Condition, tower floor plates are restricted by lot size. Setbacks and siting are controlled according to a Regulating Plan.

TOD Alternative A changes these parameters to allow for a maximum height for buildings as determined by a specified Building Type and Neighborhood Zone. All proposed TOD Overlay high-rise building types are limited to lot sizes of 40,000 or greater. Towers reaching 550' or greater are limited only to lot sizes of 90,000 SF or greater, with one tower allowed per development site (see Figure 2-2). Alternative A limits the allocation of up to 700' to three Iconic Tower buildings one allowed in each of the Auahi, Pauahi and Thomas Square Neighborhoods. The Alternative includes a total of nineteen mixed-use towers at heights ranging between 400 and 700 feet as follows:

- Ten towers are estimated at 400-420 feet.
- Six towers are estimated at 420-550 feet.
- Three towers (including one tower in Pauahi, one tower at Blaisdell Center and one tower in Auahi) estimated at 650-700 feet.

High-rise building types are summarized below:

a) Efficiency Residential
Maximum Height 240'
Floorplate maximum: 20,000SF

b) High-Rise Commercial/Office
Maximum Height: 160'
Floorplate maximum: 28,000SF

c) Iconic Tower
Maximum Height: 700'
Tapering floor plate, ranging from
20,000 SF to 11,000 SF

d) Center Core/ Point Tower
Maximum Height 550' (Limited to parcels greater than 90,000SF)
(One tower per development block)

Center Core Maximum Footprint: 12,000SF
Maximum Dimension: 120'

Point Tower Maximum Footprint: 900SF
Maximum Dimension: 120'

TOD Alternative B: Under this Alternative, the maximum building heights remains at 418' within eligible areas. Building types tested under this Alternative are summarized following:

a) Efficiency Residential
Maximum Height 240'
Maximum Footprint: 20,000SF

b) High Rise Commercial/Office
Maximum Height: 160'
Floorplate maximum: 28,000SF

c) Center Core/ Point Tower
Maximum Height 418'

Center Core
Maximum Footprint: 12,000SF
Maximum Dimension: 120'

Point Tower
Maximum Footprint: 9,000SF
Maximum Dimension: 120'

Given the prevailing height limitation, this Alternative will likely result in less diversity of building form and more buildings that provide broader floor plates. Architectural form and massing may still take advantage of changes in plane and volume to accommodate variety. While the standards presented above are virtually the same, except for building height, it is likely that developers will seek to maximize density under TOD Alternative B. The end product will likely tend to be

somewhat shorter, squatter buildings when compared to those in TOD Alternative A.

2.3.6 Transportation

Both Alternatives assume that mobility and access are not ends in themselves, but rather, means for supporting community outcomes. This portends future investments in Complete Streets prioritized to move people efficiently, safely, and comfortably.

While there are many types of walkable, transit-oriented communities around the world, they share a common characteristic: people can walk, bike, or take transit from their homes to accomplish many of their daily activities. Transitioning Kaka`ako to a walkable community will require well-coordinated public investment centered on transit stations and nodes.

To provide sufficient space for civic life, shopping, comfortable sidewalks, and vital commerce, spatially efficient modes of transportation must be prioritized. Locating jobs, housing, and services within walkable communities reduces the need for short inefficient auto trips. The six "D" principles outlined in Section 2.2 above describe how land uses and transportation integrate to create a walkable, transit-oriented community in Kaka`ako.

When the ~~HART rapid transit~~ ***light metro*** system becomes active, many more people will travel in and out of Kaka`ako each day without a car. Since almost every transit trip is preceded or followed by a walking or bicycle trip, emphasis should be placed on improving conditions for non-motorized mobility and access. The quality of pedestrian and bicycle access to transit is largely dependent on factors controlled in the public street right-of-way.

Both TOD Alternatives recommend a policy hierarchy to guide transportation and prioritize transit access investments as the KCDD is redeveloped. Figure 2-4 illustrates the modal priority contained that guides implementation.

2.3.6.1 Transit

Both Alternatives encourage transit integrated redevelopment and enhance access to ~~HART~~ ***light metro*** stations from all parts of Kaka`ako. While is responsible for the design of the stations themselves, the TOD Alternatives contemplate a set of strategies and actions for the areas around the station. Streets, paths, signage, connections to feeder transit, and buildings in the station area are the elements that tie the station together with the surrounding community.

Figure 2-4: Modal Hierarchy

Specific integration opportunities are explored for the three ~~HART~~ ***light metro*** stations: Kaka`ako Station, Civic Center Station, and Downtown Station. These strategies and actions are intended to improve connections and enhance the overall accessibility of the ~~HART~~ ***light metro*** stations as well as mitigate the impact of the elevated alignment along Halekauwila Street. Actions address setbacks, propose the location of potential new connecting streets, establish primary pedestrian access, and provide opportunities for bicycles and feeder service facilities.

As the City and County of Honolulu continues to enhance public transit, it will be important to coordinate these investments with improvements in street design, establishing clear priority for transit on important routes. Some transit routes are more important than others and different types of service require different strategies for integration with other modes of transportation. Designing streets to be sensitive to the needs of transit will require HCDA to develop clear, site-specific guidance for the different routes through the KCDD.

Figure 2-5 illustrates streets where it is critical to consider transit operations in the design and allocation of right-of-way. The dark blue, or primary corridors, are those that carry high-frequency bus service and where dedicated rights-of-way or higher levels of investment in intersection priority treatments may be needed. The introduction of rapid transit to the KCDD will significantly change the dynamic for

access to the district and mobility between the district and adjacent areas on the transit line.

Figure 2-5: Transit Priority Streets

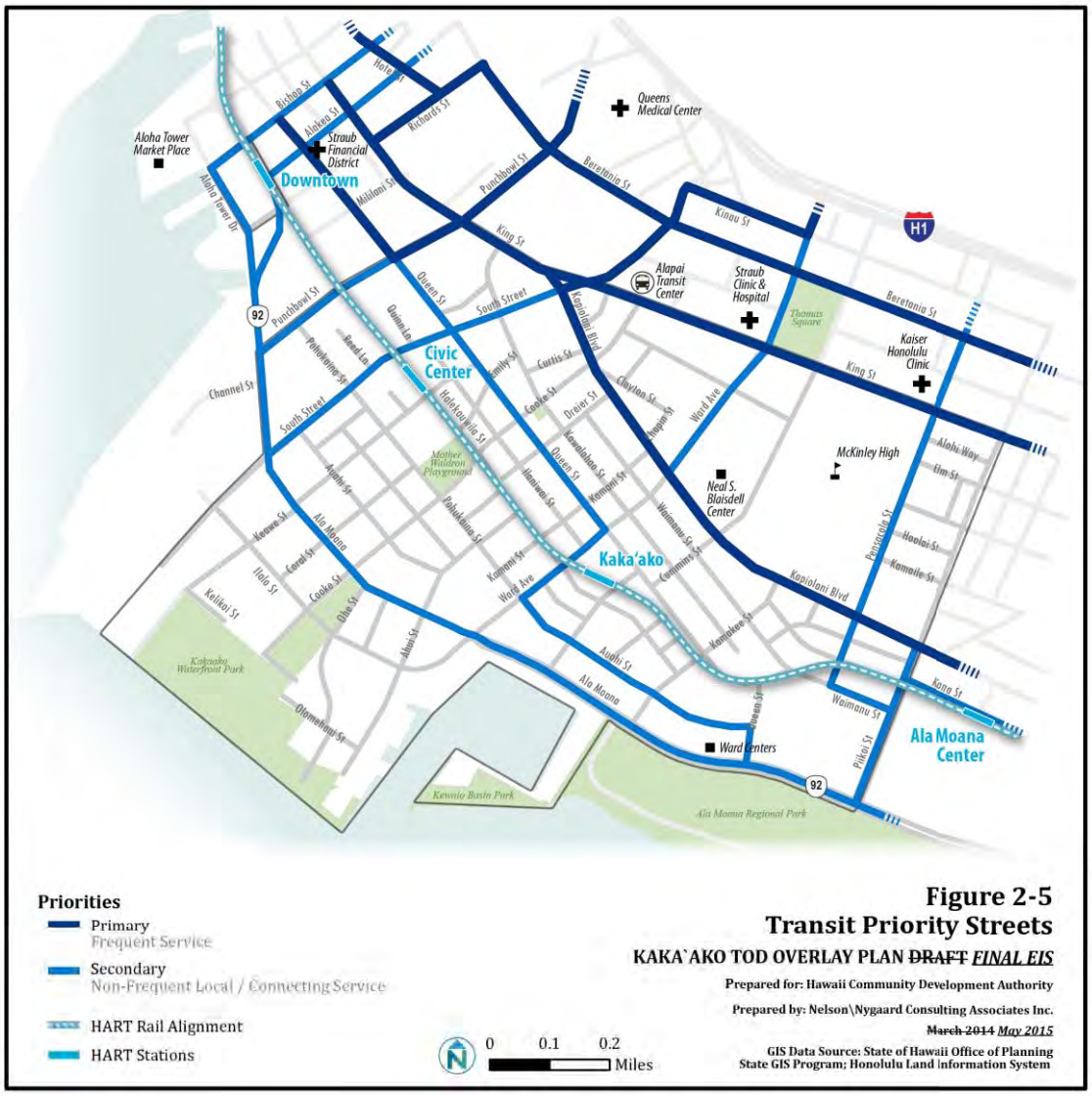
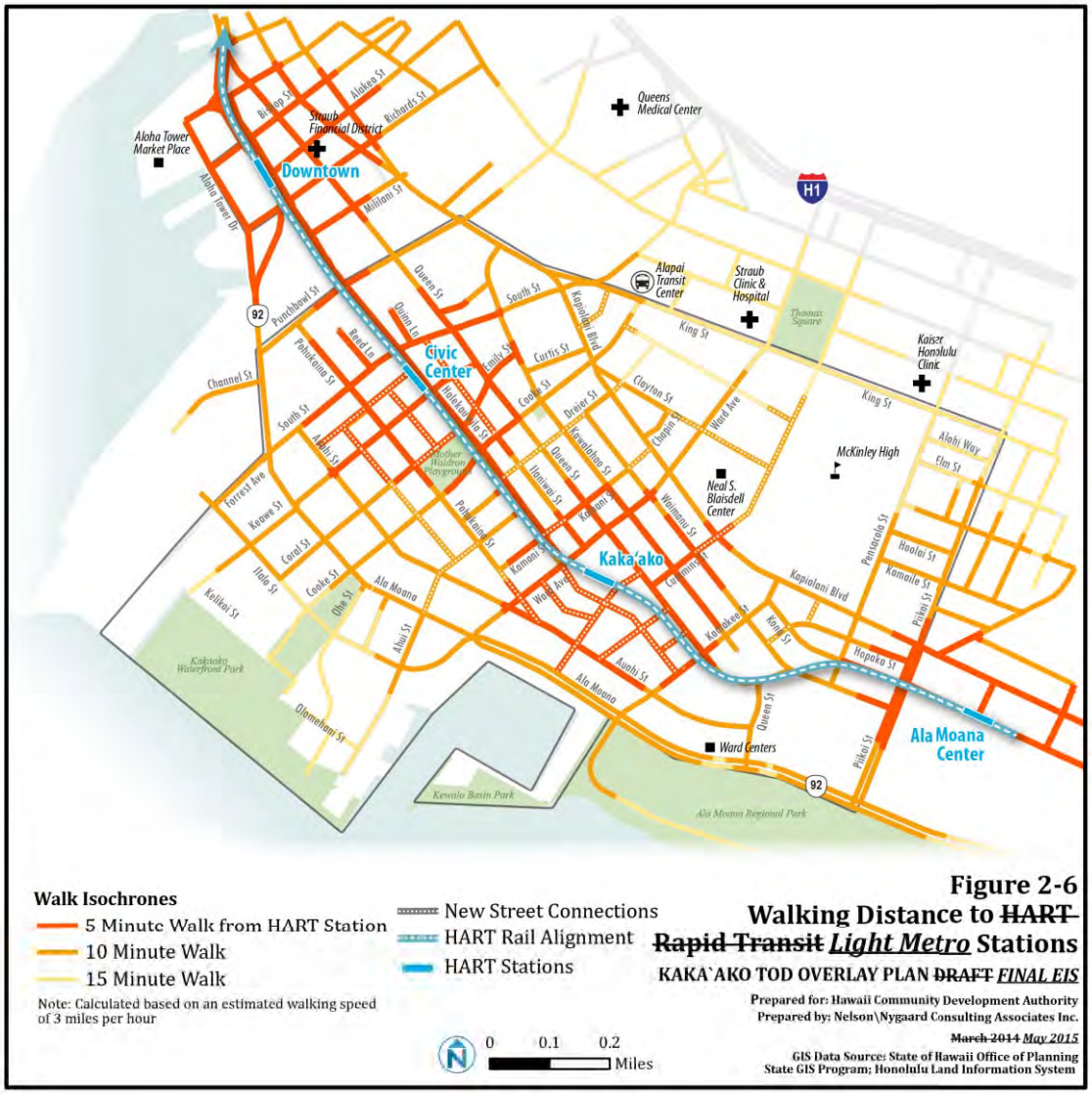


Figure 2-6 in Chapter One illustrates the approximate walk time to a ~~HART~~ ***light metro*** station from different parts of the district. If also shows how new street and pedestrian connections provided in the TOD Alternatives extend the amount of people and places with a 15-minute walk of a future ~~HART~~ ***light metro*** station.

Both TOD Alternatives initiate a modal hierarchy based on a Pedestrian First approach followed by transit, bicycles, and autos. Strategies are organized into two components—improving street connectivity and improving the modal hierarchy,

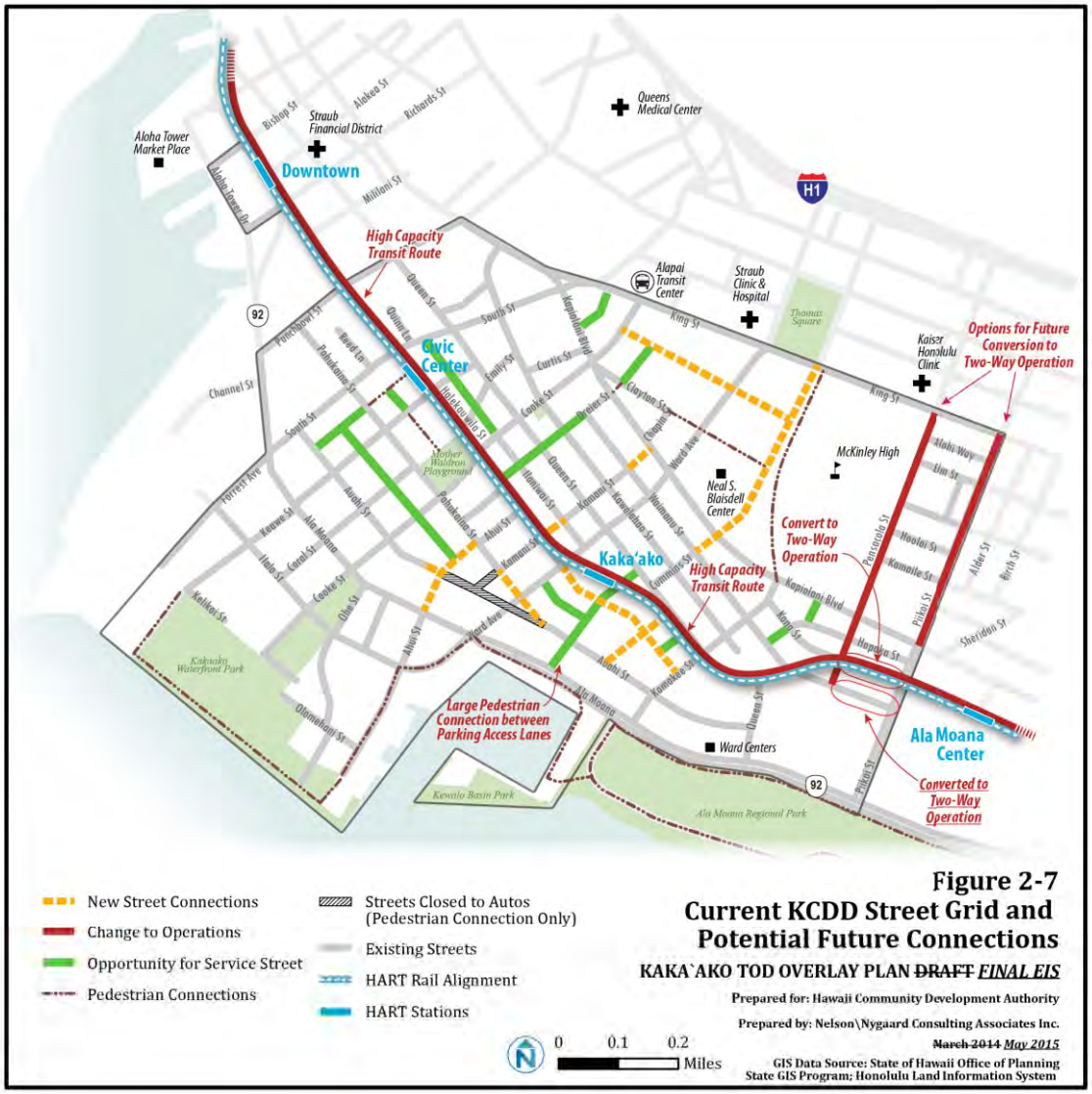
and are supported by implementation-focused actions and regulatory changes. Figure 2-7 shows the existing KCDD street grid and potential future connections as associated with urban-scaled redevelopment.

Figure 2-6: Walking Distances to ~~HART Rapid Transit~~ *Light Metro* Stations



Both TOD Alternatives include a series of strategies directing HCDA to plan and implement a "Complete Street Network" to substantially increase district access for non-motorized and transit users while preserving current levels of person mobility.

Figure 2-7: Current KCDD Street Grid and Potential Future Connections



Many of the strategies presented in the Proposed Action related to mobility and access are not the direct responsibility of HCDA and may require inter-agency coordination or partnerships to ensure implementation. In these cases, strategies are considered to be guidelines, rather than firm requirements.

Figure 2-8 illustrates the route for a potential streetcar circulator that would connect key KCDD destinations and neighborhoods with Downtown, the Civic Center, Ala Moana, and potentially with Waikiki.

Figure 2-8: Local Circulator Options

Introduction of rapid transit in Kaka`ako and adjoining districts is likely to increase overall demand for bus and at-grade transit.

2.3.6.2 Pedestrian Accessibility

Figure 2-9 illustrates where pedestrian design and investment are prioritized as the district develops and TOD in Kaka`ako is realized.

Primary pedestrian priority streets are those that connect key destinations in or adjacent to the district, including ~~HART~~ ~~rail~~ ***light metro*** stations, and that will ultimately support active street front uses such as retail stores, public plazas, and

entertainment venues. These streets require spacious sidewalks and a high level of pedestrian amenity.

Figure 2-9: Pedestrian Priority Streets in the KCDD

Secondary pedestrian priority streets are those that do not provide direct connections to major destinations or have very high traffic volumes. While these streets may never be ideal for walking along for long distances, they must still be safe enough to accommodate walking, and they should be easy and safe enough to cross that they do not serve as a barrier to pedestrians.

Low speed streets are generally service streets that may have narrow widths and where pedestrians and traffic are expected to mix in a shared right-of-way. Note

that the term "low speed streets" should not be interpreted to suggest that high-speeds are promoted elsewhere in the KCDD.

Greenway connections are streets where there is opportunity to connect parks, green-space, and public plazas with well-landscaped, shaded, and interesting walking routes.

2.3.6.3 Bicycle Accessibility

Figure 2-10 illustrates where cycling facilities should be prioritized. Primary streets are those where fully separated facilities (i.e., cycle tracks or buffered bike lanes), or on-street bike lanes should be considered. Secondary streets are those that should be signed and marked for bicyclists (with shared lane markings), but where cyclists would share the lane with traffic. Low speed streets are those that have design features that calm traffic and require motorists to drive at speeds that allow cyclists to easily integrate with traffic. The TOD Alternatives anticipate a Bike Share program.

2.3.6.4 Automobile Accessibility

Figure 2-11 illustrates Primary and Secondary Vehicular Streets that function to move auto traffic through the KCDD. All streets in the KCDD, unless a pedestrian-only connection, accommodate motor vehicle travel.

Earlier in this Chapter, Figure 2-7 illustrated the potential for a more Complete Street-oriented grid. The TOD Overlay Plan and both Alternatives would require large developments to provide through-block pedestrian connections when a substantial portion of a block is developed with commercial projects or when the ground floor uses are largely commercial. In cases where adequate lot size exists to develop two commercial projects on a block, a through block pedestrian connection is required. The Proposed Action's policies also differentiate between new full street connections, new pedestrian-only connections, and former street connection turned pedestrian-only connections.

2.3.6.5 Parking

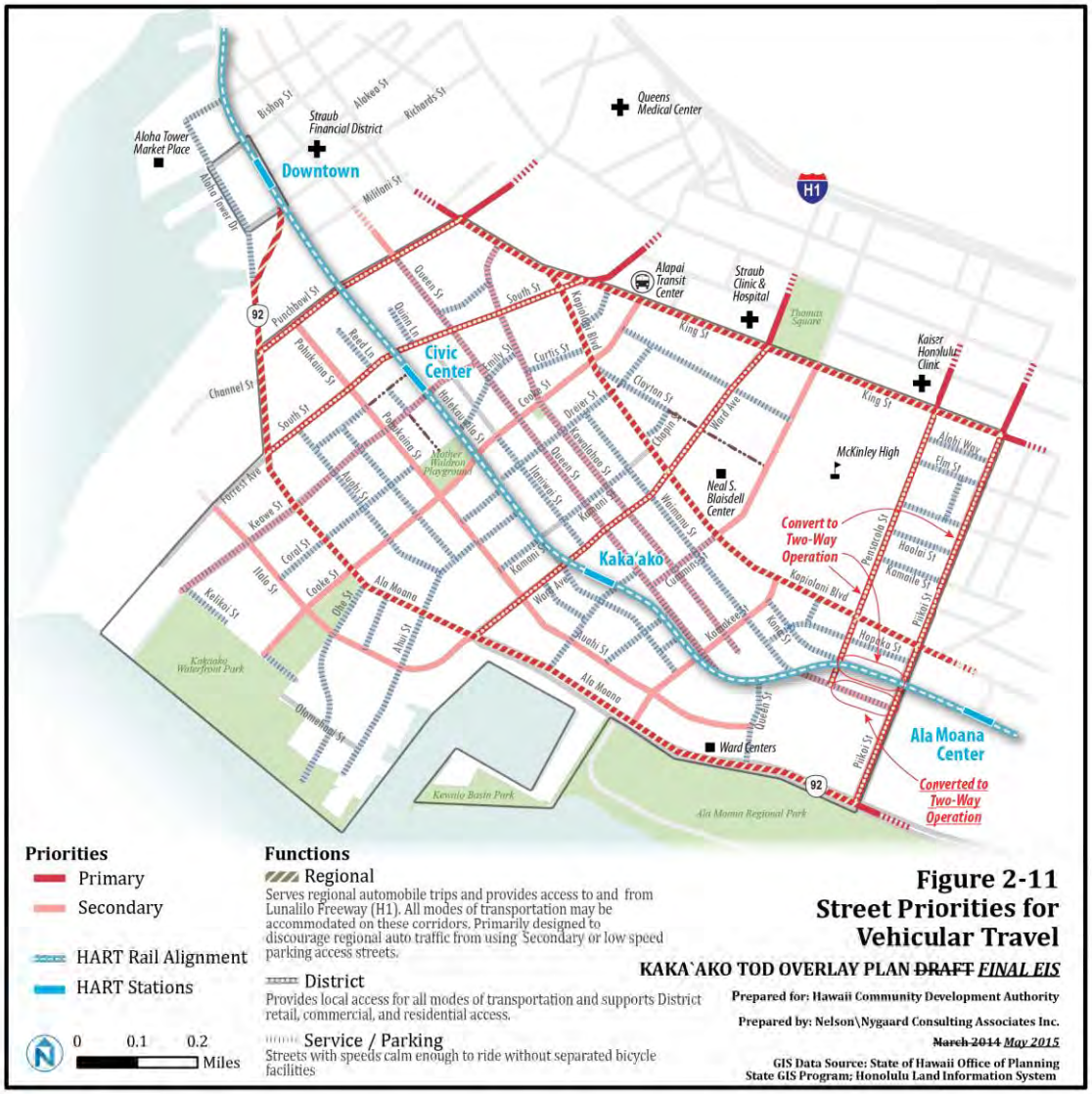
The treatment of off-street parking within a neighborhood has an impact on the quality of the public realm. Parking facility location and configuration influence not only the building form and land use options, but also the ways in which future users will travel or interact with the neighborhood. With the introduction of high-capacity transit and Complete Streets, Kaka`ako will transition to a "park once" location. This strategy encourages people who drive to the neighborhood to park only once and walk to a variety of destinations. ***Following is a summary of proposed parking policies and incentives envisioned under the Proposed Action:***

- ***Manage On-Street Parking***

    - ***Price on-street parking to ensure availability***
        - ***Designate zones and monitor parking occupancies***
        - ***Implement a pilot test of metering pricing***
        - ***Consider creating parking benefit districts***
- ***Remove Minimum Parking Requirements***
- ***Include Building Area Devoted to Parking as Part of Calculated Floor Area***
- ***Establish a Park-Once District in Kaka`ako***
    - ***Work with property owners and businesses to ensure that existing private parking is made available to the public when not needed for its primary commercial use***
    - ***Maximize use of the existing parking supply by improving wayfinding and parking information***
- ***Unbundle Parking Costs from Housing Costs***
- ***Unbundle Parking Costs from Commercial Leases***
- ***Tandem and Stacked Parking Permitted by Right***

Figure 2-10: Cycling Priority Streets

Figure 2-11: Street Priorities for Vehicle Travel



To ensure that parking demand and supply are in balance, the TOD Alternatives include the area/space needed for parking in overall density controls. Under the Mauka and Makai Area Rules, building volumes associated with above-ground parking are not included in the maximum FAR calculation, e.g. an FAR of 3.5 does not include how many floors of parking garage or area of at-grade parking that may be needed for the development. It is understood that for each new building to accommodate parking structures, an additional one to two FAR (3.5+1.0 or 3.5+2.0) are generally required (depending on the building's use). The TOD Alternatives shifts this strategy to recognize parking and its impacts as a land use.

2.3.7 Infrastructure

A KCDD Mauka Area Infrastructure Plan Update has been prepared to identify infrastructure system improvements to support future development, redevelopment, growth, diversification and densification of land use and population. The proposed infrastructure system would support a development projection to year 2035 and possibly beyond, depending on the rate of development. A summary of the infrastructure assessment and recommendations for improvement are provided below.

Since its establishment in 1976, HCDA has implemented eleven construction projects as part of its Improvement District (ID) Program to improve the network of streets and infrastructure within the KCDD in order to facilitate and encourage redevelopment and growth and maintain a safe, active community where visitors and residents may comfortably and conveniently live, work and play. The ID Program, which received funding from the Hawaii State Legislature and contributions from property owners and public utility companies, installed improvements within the road right-of-way such as: reconstructing and/or widening streets; installing streetlights, curbs, gutters and sidewalks; improving storm drain, sanitary sewer and water systems; and, upgrading and/or undergrounding of electrical power and communication systems.

A twelfth project, for improvements within Queen Street between Ward Avenue and Kamakee Street, received public opposition and construction bids exceeded available funding; as such, this project was cancelled. HCDA has no plans for future projects as part of the ID Program.

2.3.7.1 Drainage

The existing drainage system within the KCDD is inadequate to accommodate the design flows for both the existing and future conditions when including flow from outside the KCDD. [8] However, improved streets (those with curbs, gutters, sidewalks and storm drain facilities), can generally handle rainfall under moderate to severe storms. Therefore, improvements of unimproved streets are suggested so they would not be as prone to flooding during moderate rainfall events.

Since most of the Proposed Action improvements are anticipated to be vertical developments and the City requires that proposed improvements not discharge runoff to the municipal system in excess of the current condition; the anticipated affect to the municipal system will be negligible. As such, roadway flooding concerns and existing drainage system inadequacies would not be exacerbated.

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[8] Reference: Final Supplemental Environmental Impact Statement for the Kakaako Community Development District, Mauka Area Plan dated May 2009, Volume III, Appendix E - Mauka Area Infrastructure Plan

The majority of the KCDD is at elevations between the 5- and 10-foot above mean sea level and, is potentially susceptible to future sea level rise.

A large portion of the KCDD is within the Federal Emergency Management Agency (FEMA) designated Special Flood Hazard Area. FEMA regulates developments within flood hazard areas and the City DPP administers the floodplain management program.

Please refer to a detailed discussion of the KCDD's drainage system in Chapter Four, Section 4.11.4.2.

2.3.7.2 Potable Water

The existing water distribution system in the KCDD is adequate to meet the peak hour domestic demands of the Proposed Action (either alternative). However, approximately 37,600 linear feet of existing 6- and 8-inch water mains will need to be replaced with new 12-inch diameter mains to meet ~~both peak hour domestic consumption demand requirements and~~ 4000-gpm fire flow requirements.

2.3.7.3 Wastewater Collection and Treatment

The existing KCDD Mauka Area sewer system as modified by planned Howard Hughes Group (HHG) system improvements and Future Baseline and TOD Alternative proposed improvements will be capable of meeting peak hour wastewater flow requirements. Surcharged conditions will, however, continue to be experienced in branch sewers, but given the sewer line depths, spills will not occur.

Currently planned improvements include the City's Mauka Relief Sewer Corridor project, which significantly impacts the Mauka Area's wastewater master plan. Per discussion with City Department of Environmental Services (ENV), the City does not have a schedule for completing the Mauka Relief Sewer Corridor. ENV acknowledged that the project is behind schedule within Kaka`ako and that they will need to complete the improvements by year 2020, implement an alternative project, or request to extend the completion date.

2.3.7.4 Solid Waste Disposal

No modifications to the solid waste disposal program within the Mauka Area are proposed. Expansion of private contractor provided collection services might be required to meet future increased demands.

2.3.7.5 Electrical

To provide for future electrical requirements, Hawaiian Electric Co. (HECO) may serve the additional loads from its Iwilei and Kewalo Substations by adding another substation transformer, or construct and energize its proposed Cooke Street

Substation site, or a combination of the these alternatives. Beyond 9 years, HECO will likely need to secure an additional substation site; however, the need for this site would be evaluated by HECO based on actual load growth experienced before year 2035.

Where overhead facilities exist, consideration will be given to constructing underground duct systems and relocating the existing overhead conductors.

2.3.7.6 Telecommunications

Hawaiian Telcom's (HTCo.) existing Alakea and Kaka'ako Central Office facilities appear adequate to accommodate the projected residential, commercial and industrial developments. However, HTCo. may request easements within the Mauka Area or from building developers to allow multi-plexing "pair-gain" units, which would concentrate 100 customer lines onto 1 HTCo. trunk line and lessen the quantity of cables HTCo. would need in their underground duct system or onto the joint pole system.

Similar to the electrical system, where overhead facilities exist, consideration will be given to constructing underground duct systems and relocating the existing overhead conductors.

Oceanic Time Warner Cable (OTWC) presently serves the Island of O'ahu from its Mililani Technology Park facility. In the Mauka Area, where the HCDA's ID program constructed underground duct facilities, no provisions were made for OTWC facilities. Therefore, to initially serve these areas, OTWC negotiated with HTCo. to use space within the HTCo. duct facilities.

After the construction of the OTWC duct line along Ala Moana Boulevard, OTWC may be able to reconfigure its system to lessen the impact on the HTCo. duct facilities. Construction of OTWC infrastructure within the road rights-of-way, however, may be required of developers to service connection points within their development.

Similar to the electrical and telephone systems, where overhead facilities exist, consideration will be given to constructing underground duct systems and relocating the existing overhead conductors.

2.3.7.7 Synthetic Natural Gas

Currently, Hawai'i Gas has no major upgrades or line installations planned in the Mauka Area. Hawai'i Gas has indicated that they can meet additional gas service needs through installation of new or larger lines, service laterals and meters, or by providing on-site containerized gas.

2.3.7.8 Traffic Signal System

A regional study of the existing and projected traffic flows is needed to determine feasible traffic signal timing and coordination changes. Any changes should be implemented as a single construction package rather than installed piece-meal. Consultation with the City Department of Transportation Services (DTS), which would review the proposed changes, will help to minimize conflicts with DTS's deployment of their intelligent transportation systems. Traffic signal controllers that do not currently have a modem and telephone connector will need upgrading to permit the signals to be controlled by the City through its Traffic Management Center. Finally, as the traffic signal duct system is developed, fiber optic cables and closed circuit television cameras could be installed to facilitate the intelligent transportation system.

2.3.7.9 Roadway Street Light System

With the increase of residential units and commercial properties within the Mauka Area, the illumination criteria on which the present street lighting system is based may need to be evaluated and the street lighting system may need to be upgraded to account for the higher pedestrian and automobile interaction. Also, consideration will be given to upgrading the streetlights to newer technology.

As existing overhead utility lines are placed underground, the joint pole mounted streetlights could be converted to conventional streetlights on concrete foundations. Additional electrical metering locations may need to be sited in order to provide power to the street light systems.

2.4 Implementation

Once the EIS process is completed, the Proposed Action will be adjusted to accommodate public input as appropriate. The HCDA will then draft rules for implementing transit-oriented development in the KCDD. The HCDA Board must formally adopt those rules in order for TOD to be implemented. The actual timing of new TOD development will proceed incrementally, depending upon the initiatives of private landowners and public agencies with specific interests in the District, economic cycles, and the availability of public funding.

2.5 Required Permits and Approvals

The following permits and/or approvals will be required for individual development projects:

Subdivision Approval (if applicable)	Department of Planning and Permitting
Building/Grading Permits	Department of Planning and Permitting
Installation of Power Lines & Substations	State Public Utilities Commission
National Pollutant Discharge Elimination System (NPDES) Permit	State Department of Health
Noise Permit	State Department of Health
Modification of Highway Access Points	State Department of Transportation
Work Within the State Highway ROW	State Department of Transportation
Dewatering/Stockpiling	Department of Planning and Permitting
Trenching	Department of Planning and Permitting
Street Usage Permit	***Department of Transportation Services***
Development Permit	Hawaii Community Development Authority
FAA Form 7460-1	***Federal Aviation Administration***

Chapter Three: Alternatives

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3.0 Alternatives to the Proposed Action

3.1 Introduction

The EIS analysis employs the following logic: if the KCCD is hypothetically built out in 2035 pursuant to the existing Mauka and Makai Area Plans and Rules that have previously been adopted by the HCDA, certain urban design characteristics will prevail which for the purposes of the following discussion are collectively referred to as the Future Baseline Condition. The Proposed Action is an "overlay" upon the existing Mauka and Makai Area Plans, meaning that it would augment the Future Baseline Condition, regardless of which TOD Alternative is selected. Thus, this analysis focuses on a comparison of how the district would appear in 2035 if built out under the current Mauka and Makai Area Plans and Rules (Future Baseline Condition) and how the district would appear in 2035 if built out under either TOD Alternative.

It is important to understand that either TOD Alternative is essentially optional. If the HCDA eventually adopts specific rules to implement transit-oriented development in the District, pursuant to either TOD Alternative A or TOD Alternative B, the decision to develop specific properties pursuant to those new rules rests with the landowner, who can opt to develop in accordance with the existing Mauka and Makai Area Rules, or can take advantage of the density bonuses, height exemptions (limited to TOD Alternative A), and parking-standard reductions provided under transit-oriented development. This "opt-in" approach ensures that the HCDA (as well as individual landowners) have flexibility in their decision-making and can respond to changes in factors such as the timing of the light rail system's construction as well as trends in the overall economy.

It is important to note here that even if the HCDA adopts rules for transit-oriented development, it still remains an opt-in program. The Ward Neighborhood and KS Master Plans present an example of this: not all parcels within both Master Plan areas are planned for maximum density and maximum allowable height.

3.2 Defining The No Action Alternative

For the purpose of evaluating alternatives in an EIS, it is required that a No Action Alternative be considered. But, what does No Action mean for an urban area that has been targeted for redevelopment since the 1980s? Unlike a vacant rural property that might remain undeveloped for decades, Kaka`ako is already a mature urban area that has seen cycles of redevelopment for well over a hundred years. As existing structures reach the end of their usable life cycle, they will be renovated or demolished and replaced by their owners. It is highly unlikely that individual landowners would take no action over the long-term, abandon their property, and allow existing buildings to slowly deteriorate into disuse, and in so doing, forfeit any further economic return on their investment. It is

equally unlikely that no further change will occur in the district, and the land uses present today will continue in perpetuity. For these reasons, the classic interpretation of No Action is neither reasonable nor relevant to Kaka`ako.

Because the existing development rules are already in place in the KCDD, and landowners in the KCDD are responding to them with development proposals, it is not reasonable to assume that new development in the district will suddenly stop and that the district would remain the same over the next two decades as it is today. While development responds to economic cycles, and periods of strong growth are typically followed by periods of weaker growth, over the course of time the ebb and flow of development in response to market conditions and economic cycles will result in continuing physical changes within the KCDD, pursuant to the Future Baseline Condition. Thus, it is unreasonable to conclude that no further development in Kaka`ako is a likely, or even remotely possible.

Because this EIS focuses on the intentions of a governmental development authority, for the purposes of considering a No Action Alternative, the question is this: what happens if HCDA takes no further action to revise the Mauka and Makai Area Plans and Rules? In Kaka`ako, if no further action is taken by HCDA, the regulating authority, to revise the Mauka and Makai Area Plans and Rules, the future development of the district would be governed by the existing rules. Thus, the No Action Alternative is the same as the Future Baseline Condition: by the 2035 planning horizon, development in the district would be implemented in accordance with the rules that are already in place. The extent of that development is subject to market conditions and economic cycles, but the character of that development will ultimately be consistent with the development plan rules that are in place today; the Mauka and Makai Area Plans and Rules.

3.3 Implementing the Existing Mauka District Rules (Future Baseline Condition)

3.3.1 Explanation of 2035 Planning Horizon

The target year 2035 was determined by the availability of population forecasts developed by other agencies, including the State's Department of Business, Economic Development & Tourism ("DBEDT") and the City and County of Honolulu's Department of Planning and Permitting. The target year is not based upon market assumptions. No market analysis for development scenarios has been conducted for the Proposed Action. Rather, HCDA is responsible for adopting plans and rules to guide the redevelopment of the KCCD, irrespective of market conditions. Thus, for the purposes of this EIS, 2035 is identified as the target year for full build out according to the existing rules, as well as under the Proposed Action.

In all likelihood, full build out will not be completed by 2035. The target year has been selected based on the availability of population forecast data in order provide a

reasonable basis for comparing the future without the Proposed Action and with the Proposed Action. In reality, market conditions in Hawai`i roughly follow a 10-year economic cycle. Development tends to slow once the market reaches its peak and starts to decline, and then development accelerates as the market strengthens following the bottom of the economic cycle. Hawai`i is presently in the accelerating phase of the current economic cycle. It is anticipated that at least two, or possibly three market cycles will occur between now and 2035. Given this phenomenon, the Future Baseline Condition assumes full build out in the target year for the purposes of this EIS analysis irrespective of market cycles.

3.3.2 Summary Description of Baseline Condition

Table 3-1 summarizes the build out of the KCDD in 2035 under the Future Baseline Condition. The following principles are presented in the Urban Design element of the Mauka Area Plan. They describe the vision for the KCCD in 2035 under the prevailing rules:

- Create an outstanding pedestrian environment;
- Create a network of green streets;
- Provide a maximum of road connections;
- Connect pedestrian paths across major thoroughfare;
- Strong Mauka-Makai linkage;
- Support the small-lot, mixed-use pattern of Central Kaka`ako; and
- Support TOD.

Under the Mauka Area Plan and Rules, properties are allowed to be developed to a maximum floor-area-ratio (FAR) of 3.5 with the following exceptions:

- In Sheridan, all lots other than those that front King Street will have a maximum FAR of 2.0 to reflect the residential use pattern and building scale of the neighborhood, and
- In areas where infrastructure has not been upgraded pursuant to an improvement district and/or where streets do not meet the proposed standards in the Mauka Area Plan, the maximum FAR will remain 1.5. Once the infrastructure is upgraded, the maximum allowable FAR will be increased to 3.5.

Three major building morphologies were established to guide building form and height:

- Street-Front Element: Along blocks planned for promenade sidewalks, the Street Front Element must house active uses, such as offices, residences, and retail. On the ground floor, building entries and windows are required. Parking structure uses are allowed above the ground floor on blocks not designated for Promenade treatment.
    - Maximum Height: 65 feet
    - Minimum Height: Four stories or 40 feet, which ever is greater.

- Mid-Height Element: the maximum height for this element is determined by view planes from shoreline parks (Kaka`ako Waterfront Park and Kewalo Basin Park) looking mauka towards the Ko`olau mountain range. The intent is to encourage projects that maintain mauka-makai view planes.
    - Maximum Height: Range of heights 80 – 215 feet.
    - Footprint: No restriction, aside from Street-Front Elements and height setback requirement.
- Tower Element: This building morphology is provided for taller buildings and variations in the skyline while keeping a slender profile as the building increases in height.
    - Maximum Height: 400 feet where allowed.
    - Maximum Footprint: 8,000 – 16,000 square feet based on the development parcel size.
    - Length-to-Width Ratio for Tower Footprint: Limited by a maximum distance of 210 feet between the two farthest points on the tower footprint.
    - Tower Orientation: Tower to be oriented Mauka-Makai.

Table 3-1: Floor Area Build Out in 2035 – Future Baseline Condition

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF
KAKA'AKO TOTAL	**20,542**	**-**	**27,889,276**	**-**	**1,637,865**	**8,834,706**	**4,030,547**	**1,817,075**
By General Area								
Mauka	20,542	-	27,889,276	-	1,211,170	7,692,515	3,607,431	1,713,575
Makai	-	-	-	-	426,695	1,112,191	303,116	103,500
Aloha Tower Special District	-	-	-	-	-	30,000	120,000	-
By Neighborhood								
Pauahi	5,483	-	8,312,549	-	947	2,952,084	1,139,019	507,302
Auahi	5,709	-	7,509,664	-	-	854,984	963,961	294,766
Central Kaka'ako	1,937	-	2,687,136	-	234,741	972,069	173,887	833,138
Civic Center	688	-	1,038,377	-	405,526	118,792	134,797	6,650
Kapi'olani	4,176	-	4,415,873	-	54,500	1,166,257	530,983	71,720
Sheridan	436	-	724,495	-	73,871	39,561	10,078	-
Thomas Sq. District	2,114	-	3,201,183	-	441,585	1,588,768	654,705	-
Makai Area	-	-	-	-	426,695	1,112,191	303,116	103,500
Aloha Tower Special District	-	-	-	-	-	30,000	120,000	-

The Future Baseline Condition assumes that the district will retain its current development parameters and land uses as allowed under the Mauka Area Rules (2011), Makai Area Rules (2005), and approved Ward Neighborhood Master Plan and Kamehameha Schools Master Plan. All existing planning and implementation policies and existing development regulations would continue to guide development decisions for properties within the District. This scenario would extend negotiated agreements in each of the Master planned areas and assumes that no new changes would occur to land use or transportation in the KCDD other than those already programed as part of existing City or HCDA plan or proposed by other agencies.

The Future Baseline Condition does not include direct coordination with the HART alignment or mitigations that will capture the value of this public investment.

3.3 Comparing the Future Baseline Condition and the TOD Alternatives

Table 3-2 presents the general difference between TOD Alternative A and the Future Baseline Condition in 2035 in terms of building density. For example, for Kaka`ako in total TOD Alternative A will result in approximately 7,892 more residential units than would be built out under the Future Baseline Condition, but would result in a decrease in office and retail space district wide. Table 3-3 presents the general difference between TOD Alternative B and the Future Baseline Condition.

As the Proposed Action (both TOD Alternatives A and B) would result in no transit-oriented development in the Makai Area (other than some possible street improvements), it would have no direct impact on that area in terms of new development. For the purposes of analysis, the entire KCDD was divided into numbered block areas. Figure 3-1 summarizes the block areas, or "sites", that were analyzed for TOD and compares the density increases under TOD Alternatives A and B.

A more extensive comparison is presented in Chapter Four in the discussion of specific project impacts.

Figure 3-1: Distribution of TOD by Block Area – Comparing TOD Alternatives A and B

Table 3-2: Additional Development Resulting from TOD Alternative A

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF
Kaka'ako Total	7,892	1,000	12,633,115	482,735	128,483	(1,493,517)	(236,623)	(65,270)
General Area								
Mauka	7,690	628	12,296,347	307,735	128,483	(1,744,317)	(178,263)	(65,270)
Makai	-	-	-	-	-	-	-	-
Aloha Tower Sp. Dist.	202	372	336,768	175,000	-	250,800	(58,360)	-
Neighborhood								
Pauahi	3,132	-	4,702,129	-	-	(186,041)	164,478	87,184
Auahi	1,385	195	2,305,753	103,735	-	-	-	-
Central Kaka'ako	818	-	1,362,234	-	-	(333,885)	11,205	(152,454)
Civic	-	-	-	-	-	-	-	-
Kapiʻolani	891	-	1,483,665	-	(12,602)	43,003	(178,051)	-
Sheridan	-	-	-	-	-	-	-	-
Thomas Square	1,464	434	2,442,566	204,000	141,085	(1,267,394)	(175,895)	-
Makai	-	-	-	-	-	-	-	-
Aloha Tower Sp. Dist.	202	372	336,768	175,000	-	250,800	(58,360)	-

Note: Figures in parentheses are negatives.

Table 3-3: Additional Development Resulting from TOD Alternative B

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF
Kaka'ako Total	5,513	1,044	9,178,989	482,735	128,483	(1,672,658)	(228,968)	(587,779)
General Area								
Mauka	5,311	672	8,842,221	307,735	128,483	(1,923,458)	(170,608)	(587,779)
Makai	-	-	-	-	-	-	-	-
Aloha Tower Sp. Dist.	202	372	336,768	175,000	-	250,800	(58,360)	-
Neighborhood								
Pauahi	2,384	-	3,827,627	-	-	(371,529)	184,379	(328,360)
Auahi	162	317	269,135	103,735	-	-	106,966	(106,966)
Central Kaka'ako	818	-	1,362,234	-	-	(333,885)	11,205	(152,454)
Civic	-	-	-	-	-	-	-	-
Kapiʻolani	891	-	1,483,665	-	(12,602)	43,003	(178,051)	-
Sheridan	-	-	-	-	-	-	-	-
Thomas Square	1,055	356	1,899,561	204,000	141,085	(1,261,047)	(295,107)	-
Makai	-	-	-	-	-	-	-	-
Aloha Tower Sp. Dist.	202	372	336,768	175,000	-	250,800	(58,360)	-

Note: Figures in parentheses are negatives.

Table 3-4 summarizes the difference between TOD Alternatives A and B for the total Kaka`ako area when compared to the Future Baseline Condition. For example, TOD Alternative B would result in 2,379 fewer residential units in all of Kaka`ako compared to TOD Alternative A.

However, TOD Alternative B would still provide 5,513 units more than the Future Baseline Condition. TOD Alternative B would result in 179,141 more square feet more office space compared to TOD Alternative A, but the office square footage for TOD Alternative B would be over 1.6 million square feet less than the Future Baseline Condition.

Table 3-4: Difference Between TOD Alternatives A & B Compared to Future Baseline Condition for the Total Kaka`ako Area

	TOD Alternative A	TOD Alternative B	Difference
Residential Units	7,822	5,443	(2,379)
Hotel Units	1,000	1,044	44
Residential SF	12,633,115	9,178,989	(3,454,126)
Hotel SF	482,735	482,735	0
Civic SF	128,483	128,483	0
Office SF	(1,493,517)	(1,672,658)	179,141
Retail SF	(236,623)	(228,698)	(7,925)
Industrial SF	(65,270)	(587,779)	522,509

Note: Figures in parentheses are negatives.

As summarized in Table 3-5, the additional residential units envisioned under either TOD Alternative A or Alternative B would result in increased population compared to the Future Baseline Condition, but a decrease in operational and office jobs. However, overall construction jobs would increase by approximately 20,588 for TOD Alternative A and approximately 13,695 for TOD Alternative B when compared to the Future Baseline Condition.

Table 3-5: Population Comparison in 2035 – Proposed Action vs. Future Baseline Condition

	Full Time Residential Population	Average De Facto Population (1)	Total Operational Jobs at Build-Out (2)	Office Jobs Only	Cumulative Construction Jobs from Full Build Out (3)
Future Baseline Condition	33,466	33,844	51,207	37,186	55,991
TOD Alternative A	46,273	48,312	45,159	30,397	76,549
Difference from FBC	12,807	14,467	(6,048)	(6,789)	20,588
TOD Alternative B	42,569	44,554	43,512	29,583	69,685
Difference from FBC	9,103	10,710	(7,695)	(7,603)	13,695

(1) "De Facto" Population = Full-time residents minus those temporarily away, plus part-time residents and (for Proposed Action) hotel guests.

(2) Total full- and part-time jobs, all shift and days of week.
(3) In worker-years (e.g., two half-time jobs = one worker-year); includes some "soft-cost" (architect – engineer) jobs

The Proposed Action will also result in changes to urban design, building form, and streetscapes in the District over those proscribed in the Future Baseline Condition. Under TOD Alternative A, floor area ratios (FAR) would have a slightly higher range in the Pauahi Neighborhood than under TOD Alternative B (5.0-10.0 for TOD A vs. 5.0-9.0 for TOD B). Figures 3-2 and 3-3 present a graphic comparison of FAR under the Alternatives.

Building heights on identified properties could increase from the current limit of 400 feet (plus appurtenant utilities) to approximately 550 feet, with a maximum of three properties capable of accommodating an *iconic* tower of up to 700 feet in height, under TOD Alternative A, but would remain the same as the Future Baseline Condition under TOD Alternative B. See Figures 3.4 and 3.5 for a graphic comparison of heights. Figure 3-6 presents the location of *iconic towers* envisioned in TOD Alternative A.

Table 3-6 presents a comparison of the total estimated square footage for parking in each of the TOD Alternatives as compared to the Future Baseline Condition.

Table 3-6: Comparison of Garage Parking (Future Baseline Condition vs. Proposed Action)

	Future Baseline Condition	TOD Alternative A	TOD Alternative B
Garage Parking (total SF)	18,496,225	20,916,071	20,086,628
Difference from FBC		2,419,846 (13.1% more)	1,590,403 (8.6% more)
Difference from TOD A			-829,443 (35% less)

Figure 3-2: Distribution of Maximum FAR for TOD Alternative A

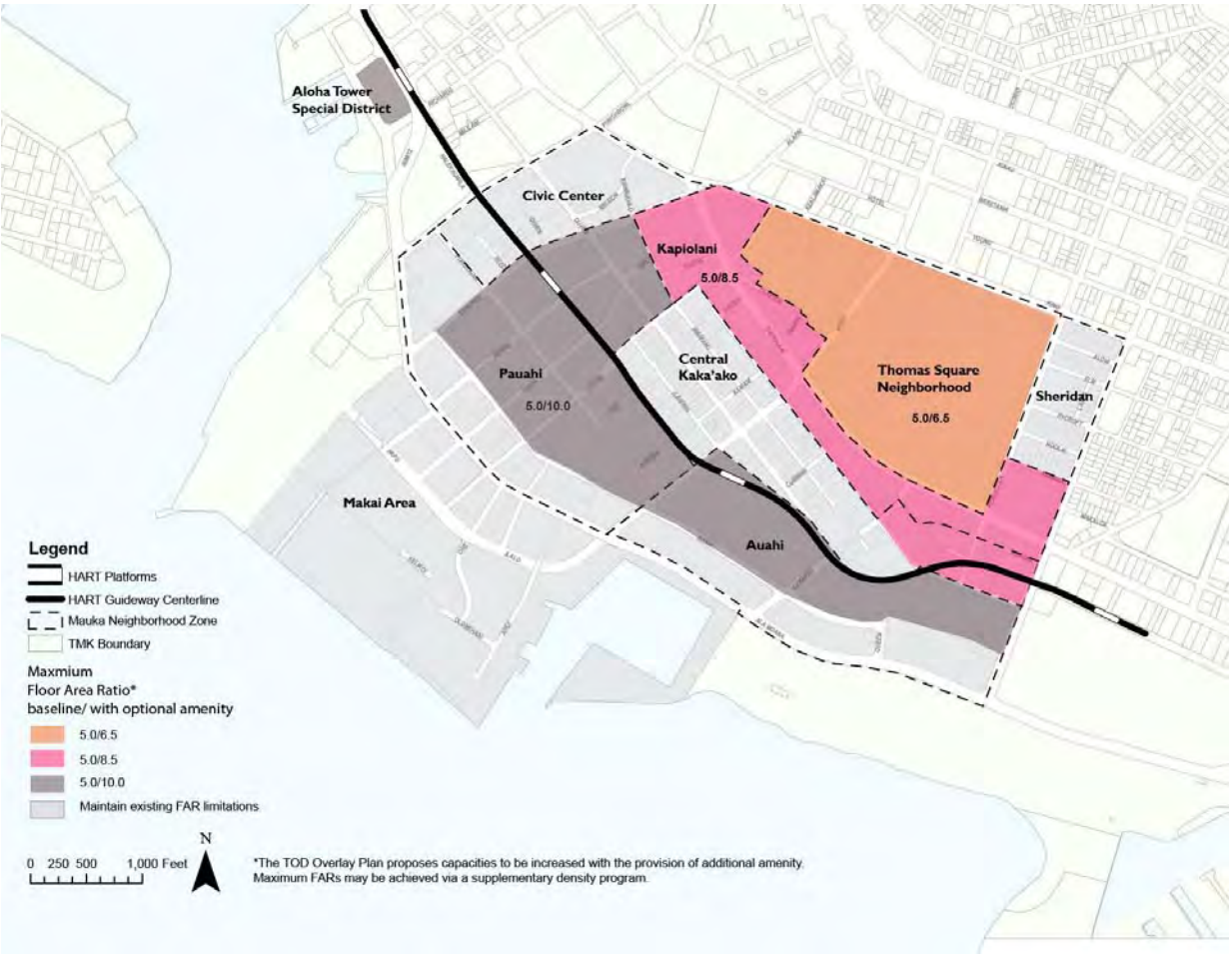


Figure 3-3: Distribution of Maximum FAR for TOD Alternative B

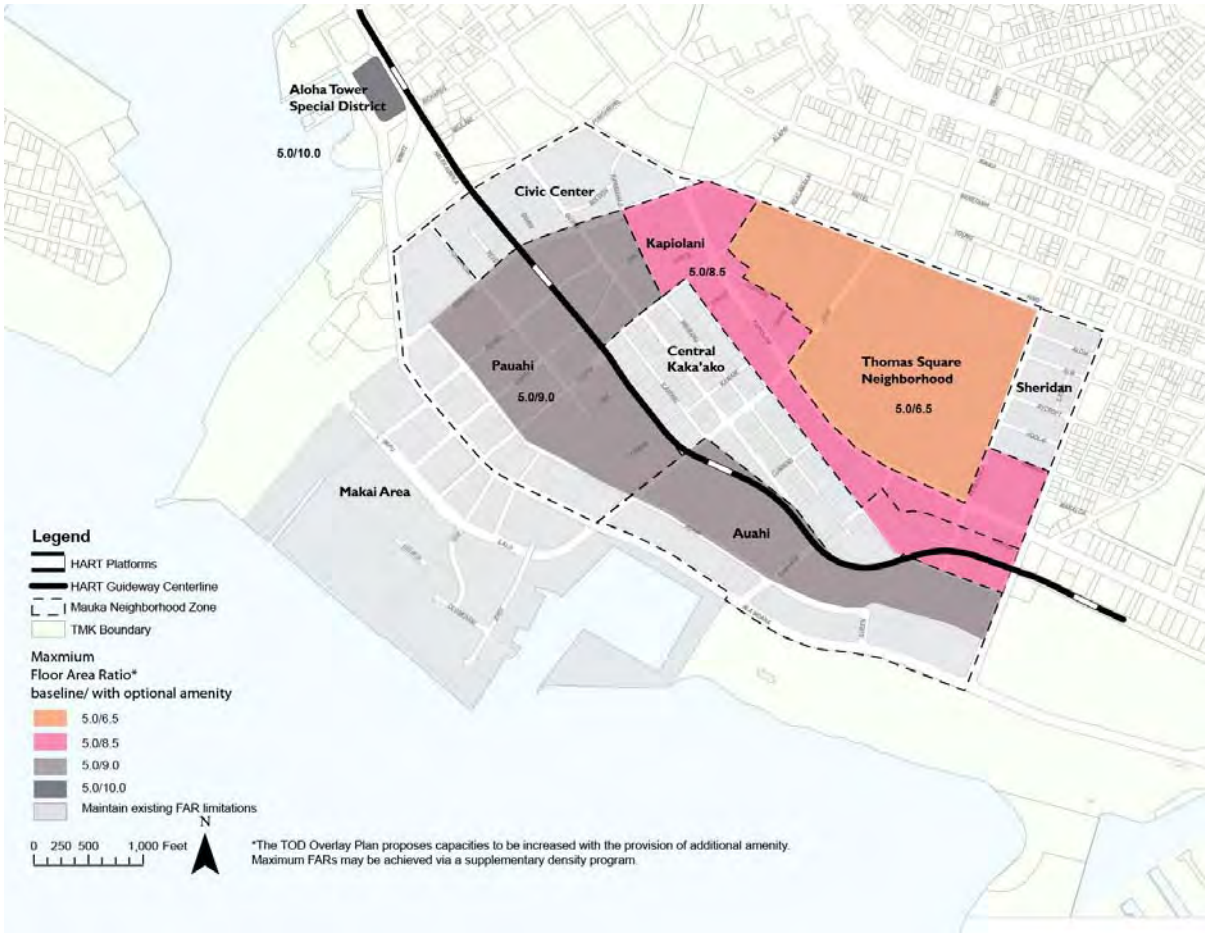


Figure 3-4: Height Limits Under TOD Alternative A

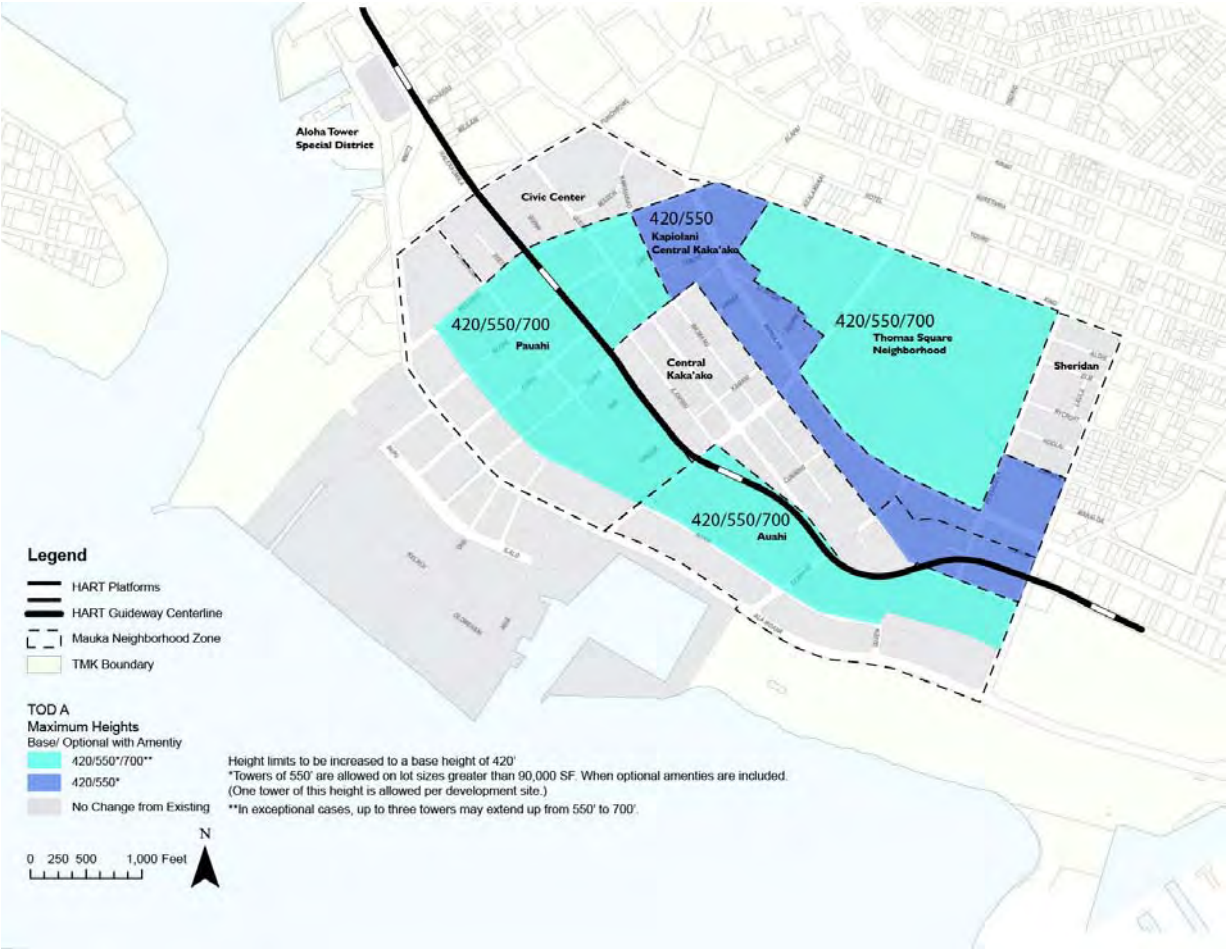
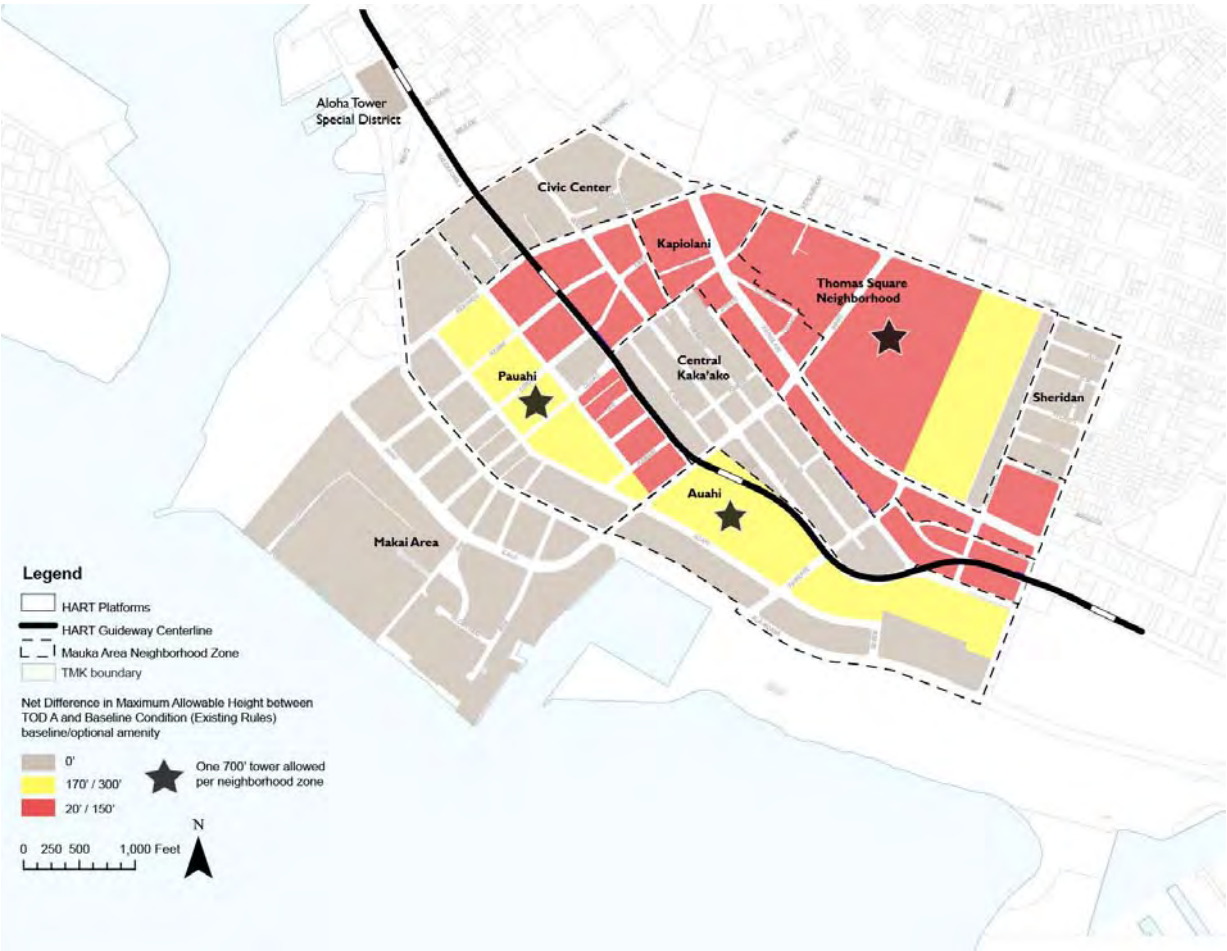


Figure 3-5: Height Limitations Under TOD Alternative B

Figure 3-6: Comparison of Height Limitations – TOD A vs. Future Baseline Condition



3.4 Other Alternatives

For the purposes of this environmental impact statement, the only reasonable alternative to the Proposed Action is the continued development of the KCDD under the existing rules (the Future Baseline Condition). The following alternatives have been rejected from further consideration as being unreasonable because they do not fulfill the objectives of the HCDA.

3.4.1 Community Development Plan and Land Uses

Established as the State's first Community Development District, pursuant to the passage of Chapter 206E, HRS, in 1976, Kaka`ako was considered to be underdeveloped and underutilized relative to its central location in urban Honolulu. Since then the rules governing development in the District have evolved with the adoption of the original Mauka Area rules in 1982 and its revision in 2009. Today, the District has changed significantly; from a low-rise, low-density industrial/commercial district to an area of

mixed uses including high-density residential projects and commercial and industrial land uses. Kaka`ako in 2014 continues to fulfill the legislature's vision for the District.

Alternative community development plans and land uses within the District are not possible, unless they either conform to the current Mauka and Makai Area Plans and Rules or conform to the approved Kamehameha Schools land Master Plan or Ward Neighborhood Master Plan. To implement an alternative vision for the District, action must first be taken to either A) amend Chapter 206E, HRS; B) amend the prevailing Mauka Area Plan and Rules; or C) amend the existing Kamehameha Schools Master Plan or the Ward Neighborhood Master Plan. While any of these actions is possible, the outcome is not foreseeable as each would involve an extensive public outreach process and prolonged regulatory review process. For these reasons, alternative community development plans and land uses are not considered to be reasonable alternatives to the Proposed Action for the purpose of evaluation in this EIS.

3.4.2 Alternative Locations

Because the KCDD is a physical area proscribed by law, it is not possible to relocate the Proposed Action to an alternate location.

While the Proposed Action is not solely focused on the HART elevated light rail system, the anticipated presence of the rail line in the KCDD presents specific transit-oriented development opportunities that are disclosed in Chapter Two. If the alignment of the HART system were to be altered to another alignment within the KCDD, the Proposed Action would still remain relevant. Even if the rail project was not constructed, the attributes of the Proposed Action would remain, although its implementation might not be fully realized because the alternative transportation opportunities the light rail system provides would not be available for the landowner intent on development, and density and height bonuses might not seem as attractive.

3.4.3 Alternative Implementation Strategies

As discussed in Chapter Two, the year 2035 has been identified as a target build-out year for the purposes of this environmental analysis. The actual rate of development may vary in response to market forces that cannot be predicted at this time. Alternative implementation strategies would involve bringing more residential units to market in a shorter time frame or a longer time frame. Because the vast majority of properties within the KCDD are privately owned, the decision about when to develop individual properties is beyond the control or authority of the HCDA.

The actual timing of implementing either TOD Alternative A or B will also be dependent upon decisions that must be made by the City and County of Honolulu with regard to implementing improvements to the regional wastewater collection and treatment system. A current plan to add a new region-serving sewer main to relieve wastewater collection issues in Waikiki has yet to be finalized by the City. Timely implementation of a new collection main, and possibly a new sewer pump station in, or near, the District by

the City would likely increase available collection capacity for new projects within the District. However, regardless of collection capacity issues, if the Honolulu Wastewater Treatment Plant does not have adequate capacity to treat wastewater generated in the KCDD or elsewhere in the East Mamala Bay service area, the timing of specific development projects will be affected.

Ultimately, the Proposed Action is a vision for the future of the KCDD and will remain relevant despite near-term or long-term decision making by the City or by individual property owners. The adequacy of infrastructure to serve the densities envisioned under the Future Baseline Condition and the Proposed Action is a pre-requisite for development.

3.4.4 Alternative Strategies for Providing Reserved Housing

HCDA's current program for the provision of affordable housing, called Reserved Housing, is geared toward a specific housing project type that targets the workforce or gap-group market instead of the entire affordable spectrum. There are other State agencies, such as the Hawaii Housing Finance and Development Corporation (HHFDC), which specialize in the development of affordable housing. Since the inception of the Mauka Area Plan, affordable housing units have been developed in the Mauka Area by state agencies. As such, HCDA's focus has been to stimulate the production of housing units for workforce buyers from 100 percent up to 140 percent of average monthly income (AMI) by ensuring that a portion of residential projects are set aside, or *reserved* for this income group. The reserved housing is different from *affordable* housing, which is usually targeted at lower income groups.

Under the existing Mauka Area Plan (and Future Baseline Condition), all new residential projects within the Mauka Area on lots of 20,000 square feet or more contribute to the development of Reserved Housing by producing the units or by paying fees to construct these units. In return for providing Reserved Housing, developers receive non-monetary offsets in the form of density (or height) bonuses, modifications to rules, and expedited permits. The existing Reserved Housing program requires that 20 percent of the new residential floor area for lots of 20,000 square fee or more be reserved and developed for buyers or renters with qualifying incomes not more than 140 percent of AMI, together with other restrictions. For rental projects, 15 percent of residential floor area shall be set aside for Reserved Housing.

The Proposed Action includes provisions to revise the Reserved Housing Program (see Chapter Four, Section 4.10.5.2). Alternatives to the existing Reserved Housing program have not been considered because of the acknowledged difficulties in developing any form of affordable housing, including Reserved Housing. Profitability is an extremely important consideration in encouraging landowners to undertake residential projects. The reservation of 20 percent of a new project's residential floor area for a Reserved Housing program (15 percent for rental projects) results in a project generating less revenue than what would be expected from market-rate units. Altering the Reserved Housing program to require a greater set aside provision would likely act as a

disincentive for residential development in general, and Reserved Housing development in particular.

Arbitrarily limiting the density standards of the Proposed Action will likely reduce affordable building options, which in turn, could further limit the provision of Reserved Housing units. As presented in Table 3-4 above, TOD Alternative B would generate approximately 2,379 less residential units than TOD Alternative A when compared to the Future Baseline Condition. This translates into about 475 less Reserved Housing units under TOD Alternative B than would be provided by TOD Alternative A, when compared to the Future Baseline Condition.

The provision of reduced parking standards and building height bonuses in TOD Alternative A is specifically intended to further incentivize the development of Reserved Housing units. These incentives are constrained in TOD Alternative B due to the restriction on building height.

3.4.5 Alternative Densities

The proposed set of High-Rise Building Types presented in Section 2.3.5 as part of either TOD Alternative A or B aim to strike a balance between constraints on building mass and volume, aesthetics, and market feasibility. This is because smaller tower floor plates (less than 11,000 square feet) tend to become more luxury-oriented as the ratio between a building's exterior surface area and interior is increased, bringing up the cost of the building envelope per interior salable square foot. Too heavy an emphasis on narrow floor plates means that fewer towers will be built, and the goal of making Kaka`ako a Hawai`i resident-focused, high capacity neighborhood would not be achieved. TOD Alternative A includes more affordable building options, together with a tall floor plate option of a mid-range of 11,000 square feet untethered from the previous lot size requirements found in the current Mauka Area Rules (the Future Baseline Condition).[1]

[1] It is still required that all buildings must have a parcel at a minimum lot size of 40,000 square feet to participate in the Proposed Action's height (TOD Alt. A) and density increases (TOD Alt. A & B).

Chapter Four:
Affected Environment, Potential Impacts and Mitigation Measures

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4.0 Affected Environment, Potential Impacts, and Mitigation Measures

This chapter discusses the existing conditions in the affected environment and analyzes the potential impacts that would result from implementation of the Proposed Action. Where impacts are deemed to be significant, measures to mitigate those impacts are identified.

However, it must be emphasized that ultimately the Proposed Action is incentive based: landowners can utilize the TOD Overlay Plan approved by the HCDA in developing their property, to the extent allowable, if they wish to take advantage of the development incentives it offers (in exchange for providing exemplary public benefits). However, if they choose not to utilize the TOD Overlay Plan, they can develop their property in compliance with the applicable Mauka or Makai Area Plan and Rules (the Future Baseline Condition).

4.1 Climate and Climate Change

4.1.1 Affected Environment

The climate of the Hawaiian Islands is generally characterized by mild temperatures year round and frequent northeast trade winds during the summer season from May through October. The warmest temperatures of the year can occur between late August and early October with an average high of 89 degrees F. The coolest temperatures typically occur in February with lows in the lower 60s. The winter season (November through April) is characterized by cooler temperatures, elevated precipitation, and variable winds, including Kona (southerly) winds and storms [Juvik and Juvik; 1998]. Annual rainfall in the general Honolulu area ranges between 20 and 30 inches. However, coastal areas tend to be drier than the lower slopes and valleys of the Ko`olau mountain range that defines the inland boundary of Honolulu. Relative humidity ranges in Honolulu from the mid-60s (percentage) to the upper 70s (percentage). It has been observed over the past decade that the frequency of trade wind conditions in Hawai`i has been declining. It is suspected that this phenomenon is related to global warming. A decline in trade winds can contribute to warmer ambient temperatures locally and to less wind-driven rainfall.

Honolulu's climate is typical of the leeward coastal lowlands, with mild temperatures and abundant sunshine. Infrequent storms tend to arrive from the northeast in the summer and the northwest in the winter.

Microclimates exist within the greater Honolulu area. The climate of Kaka`ako varies from less urbanized areas. Kaka`ako is likely to be slightly warmer because of the abundance of development in the form of streets, sidewalks, and concrete buildings

which all tend to reflect solar energy, and the limited number of trees that would otherwise provide cooling shade.

4.1.2 Potential Impacts and Recommended Measures to Mitigate Them

Under the Proposed Action, no significant adverse impact upon the climate is anticipated. Although the density of the area will be greater than the Future Baseline Condition, and some buildings may be taller under TOD Alternative A, the overall size of the Mauka Area is not large enough to influence the regional climate. Taller buildings will create more shade, but this will result in a negligible impact in terms of climate, and a beneficial impact in terms of adding to the comfort of pedestrians on the street, especially during the warmest months of the year.

The presence of new multi-story buildings pursuant to the Future Baseline Condition or the Proposed Action may change wind patterns within the District by creating a tunneling affect between some buildings. However, it is not possible to say with any certainty where this change might occur, because it depends on the physical shape of the buildings, their orientation to the wind, and their proximity to one another. Under the form-based zoning code adopted by the HCDA that guides urban design in the District, taller buildings will likely be more slender than mid-level buildings. For this reason, it is anticipated that taller buildings will have less of an impact on wind conditions at the street level. An observed decline in ambient trade wind conditions that may possibly be related to global warming may mitigate the cumulative impact of new construction in the District (see discussion in Section 4.1.3.5 below). Ambient temperatures are not anticipated to change because the Mauka Area is already a mature urban area with wide paved streets and building rooftops that absorb heat during daylight hours and radiate it back to the atmosphere as they cool at night.

No mitigation measures are proposed at a District wide level. Wind studies are typically commissioned by the architect during the design phase of individual buildings to determine the impact of wind on ground-level lobbies and foyers.

4.1.3 Climate Change

As the only state in the nation that is located in the tropics and surrounded by ocean, Hawai`i is likely to experience the impacts of global climate change in unique ways. Although these changes cannot be easily isolated to specific geographic areas, climate change may result in measurable impacts that are discussed below.

4.1.3.1 Sea Level Rise

The most reliable means of identifying sea level rise in a given area is a comparison of the height of mean sea level over a period of time. Dr. Charles Fletcher of the University of Hawai`i's School of Ocean and Earth Sciences and Technology (SOEST) stated in a briefing to the Hawai`i State Legislature in 2010, "Sea level has risen in Hawai`i approximately 0.6 inches per decade over the past century and probably longer…Sea level rise accelerates

and expands erosion, potentially impacting beaches that were previously stable…Although the rate of global mean sea level rise has approximately doubled since 1990, sea level did not rise everywhere, but actually declined in some large areas. The pattern of sea level rise is complex due to the fact that winds and ocean currents affect sea level, and those are changing also." [Fletcher; 2010]

For the purposes of this EIS, Professor Makena Coffman of the University of Hawai`i at Manōa, was asked to prepare a report focusing on issues pertaining to sea level rise. Following are excerpts from her report, which is presented in Appendix B.

There are two types of sea level rise. The first is global (eustatic) mean sea level and the second is local relative sea level. Global mean sea level rise is systematically used for sea level rise projections because it most accurately reflects the elevation of sea level due to climate change (Williams, 2013). There are two primary factors affecting global mean sea level rise. The first is the introduction of more fresh water into the ocean resulting from glacial melting and increased precipitation.

The second is the thermal expansion of seawater due to increases in its temperature. Local relative sea level includes a combination of phenomenon relating to regional and local geophysical and oceanographic factors (Williams, 2013). It should also be noted that sea level is not a uniform phenomenon. In the Pacific Ocean, for example, sea levels tend to be higher along the eastern coast of Asia, especially in Southeast Asia, than in the mid-Pacific, due primarily to the rotation of the Earth and the movement of ocean currents.

Global Mean Sea Level Rise Projections

Global mean sea levels have been fairly stable for the past 3,000 years until mid-19th century. Global mean sea level in the 20th century began rising at an average rate of 1.7 mm per year and the current average rate is nearly double, at 3.1 mm per year (Williams, 2013). Scientists have shown that acceleration in global mean sea level rise is primarily due to the phenomenon of global warming, or human-induced climate change (Nicholls et al., 2007).

Projections of increases in global mean sea level vary. IPCC (Intergovernmental Panel on Climate Change) 2007 predicted a range of 0.18 to 0.59 meter increase (relative to 1980-1999) by the year 2100 (IPCC, 2007). However, this model excludes "dynamical changes in ice flow," or rapid glacial melting. As more information becomes available, particularly about the impact of glacial melting, it seems that actual increases are on the more extreme end of the spectrum. A more recent synthesis of the science suggests that planning for a range between 0.5 to 2 meters by the year 2100 is advisable (Williams, 2013). Though a range of 4 to 8 meters is possible by 2100, it is not likely until after the 2100 time frame (Williams, 2013).

Hawaii's Sea Level

Local factors affecting sea level are tremendously complex, including issues of land subsidence, isostatic adjustment of the earth's crust, tectonic forces, gravitational changes, ocean circulation and wind patterns (Williams, 2013). While under-standing all of the components of local relative sea level would be ideal for planning purposes, it is difficult to "down-scale" global climate models for regional predictions. There is, however, global positioning system (GPS) monitoring of tide gauges in Honolulu as well as data that goes back to the turn of the 20th century. Based on GPS monitoring, there was an increase of approximately one half (0.50) meter of mean sea level in Honolulu between 1905 and 2006, which amounts to a mean sea level rise trend of approximately 1.5 mm per year (NOAA, 2013). This is slightly lower than the global mean sea level rise of the 20th century. Whereas global mean sea level rose approximately 6 to 8 inches over the past century, Hawaii's sea levels rose approximately 6 inches (though it differs by island) (Codiga and Wager, 2011). That Hawaii's rate of sea level rise is lower than the global average is due to a variety of factors (Codiga and Wager, 2011) and is not necessarily evidence that it will remain so in the future.

In 2011, the University of Hawaii Sea Grant College Program Center for Island Climate Adaptation and Policy released the report *Sea-Level Rise and Coastal Land use in Hawaii: A Policy Tool Kit for State and Local Governments* (Codiga and Wager, 2011). Through consultation with local experts, and considering both global and local factors, Codiga and Wager suggest planning for sea level rise of approximately 1-foot by 2050 and 1-meter by 2100. This is much in line with the planning occurring in other places (see for example Parkinson and McCue, 2011).

4.1.3.2 Reduced Precipitation

Discussions with National Weather Service (NWS) staff indicate that in general terms the Hawaiian Islands have been experiencing a drying trend in the past few years. Whether this trend is directly related to global climate change is unknown. But the NWS observes that rainfall patterns may now differ from those that occurred in the 1980s. Along windward slopes, while the number of rain-days has been near normal, the amount of rain per day is only about half as much on average. This is believed to result from a lowered inversion layer (that point in the upper atmosphere that caps the height of cloud buildup), resulting in less windward showers being blown into leeward areas. (Personal communication; Kevin Kodama (Lead Forecaster, National Weather Service, 11/8/11)

According to the Rainfall Atlas of Hawaii, "…the rainfall evidence and other data point to a downward trend in mean rainfall that may persist at least through the end of this century." [Hawaii Rainfall Atlas 2011, http://rainfall.geography.hawaii.edu/rainfall.html]

Decreasing precipitation rates have also been attributed to the increased vog in the atmosphere since the mid-1980s when Pu`u O`o began erupting on the Island of Hawai`i. It is now understood that the presence of increased amounts of particulate matter in the atmosphere attracts water molecules to bond with the volcanic particles. The result is

that when the particles bond with water molecules, they tend to create more clouds, but the clouds produce less rain because the water molecules are dispersed and do not bond with each other to form rain droplets large enough to fall to earth: they stay suspended in the atmosphere. [Kodama; ibid]

4.1.3.3 Increased Storm Intensity

While there is evidence that rainfall rates are decreasing, there is some evidence of higher periods of episodic rainfall, where several inches of rain can fall in a matter of a few hours. This appears to be global phenomenon that has also manifested in the Hawaiian Islands. Examples of these episodic precipitation events (derived from NWS on-line data) include:

- September 5, 1996: 12 inches of rain at Ewa Beach, O`ahu in 3 hours;
- November 29 to December 8, 2003: 33 inches of rain at Windward O`ahu;
- August 3, 2004: 10 inches of rain at Windward O`ahu in 24 hours; and
- October 30, 2004: 10 inches of rain at Manoa, O`ahu in 12 hours.

In addition to rainfall, an increase in thunderstorm activity has occurred. Most recently, on May 3, 2011, Windward O`ahu experienced an intense electrical storm that resulted in nearly 26,000 recorded lightning strikes in a 24-hour period according to the NWS. It has been suggested that the phenomenon of increased particulate matter in the atmosphere discussed above also increases static electricity that may be the source of increasing incidences of lightning. (http://www.hawaii.edu/news/article.php?aId=6652)

Periods of intense rainfall can also obscure longer-term precipitation trends. If a given area has an average annual rainfall of 40 inches, but in a given year a quarter of that is attributable to a single event, the total rainfall for that year may seem normal but actually disguises a possible drying trend, and equally as problematic, declining groundwater recharge, because much of the episodic rainfall is runoff resulting in very little percolation to the groundwater aquifer.

4.1.3.4 Ocean Acidification

Ocean acidification results from increased volumes of carbon dioxide mixing with seawater. Measurements at a monitoring station (Station ALOHA) over two decades document that the surface ocean around Hawai`i has grown more acidic at exactly the rate expected from chemical equilibration with the atmosphere. Continued acidification may have a host of negative impacts on marine biota and the potential to alter the rates of ocean biogeochemical processes. [Fletcher; ibid, page 4] The principal concern is the destructive effect of acidification on the ability of shell-producing marine biota, including coral, to produce their protective shells. At a large scale, ocean acidification can undermine the stability of coral reefs. The loss of a coral reef that serves as a barrier to help dissipate wave energy can expose coastal areas to stronger storm surge.

4.1.3.5 Changing Trade Wind Conditions

The frequency of trade wind conditions in Hawai`i appears to have been declining over the past several years (ibid. personal communication; Kevin Kodama, 11/8/11). A "trade wind day" is identified by the NWS as a day when the winds are blowing predominately from the northeast and strong enough to eliminate the effects of on-shore and offshore breezes that typify calmer wind conditions. It has been noted by the NWS that over the past several years, the number of trade wind days has been declining. While it is not certain whether this change is directly related to global warming, it appears to coincide with changing regional climatic conditions in the North Pacific and is, therefore, unlikely to be a localized phenomenon. A loss of trade winds equates to a loss in their cooling effect, especially during the warmest months of the year.

4.1.4 Potential Impacts and Recommended Measures to Mitigate Them

4.1.4.1 Sea Level Rise Impacts

While no comprehensive vulnerability assessment exists for the KCDD, there are three existing studies and sources that suggest much of the KCDD will experience persistent flooding with a 1-meter sea level rise.

The Coastal Geology Group at SOEST at the University of Hawaii at Manōa has mapped a meter of sea level rise contour line (during high tide) in the broader Honolulu area (CGG, 2009). Much of the KCDD is within this zone: the entire *makai* area and much of the *mauka* area.

The National Oceanic and Atmospheric Administration (NOAA) recently released their Sea Level Rise and Coastal Flooding Impacts Viewer (NOAA, 2013a)[1], which maps between 1 and 6-feet of sea level rise throughout the U.S. Within Honolulu, while the map is at a relatively high level, it is possible to see the inundation of the KCDD. The map additionally shows that NOAA classifies the KCDD as *vulnerable.*

Providing more context, a report released by the NOAA Coastal Storms Program (2013) looks at the impacts of a of 1-meter sea level rise coupled with additional flooding due to hurricane, tsunami and riverine overflow[2]. The study covers the greater Honolulu area, from Pearl Harbor to Diamond Head. The 1-meter sea level rise is considered a baseline for analysis of storm events and thus it is not possible to isolate the mapping of 1-meter of sea level rise. However, given this has been done in previous studies, the added value is in building understanding the relationship between sea level rise and storm events.

In the hurricane storm surge and tsunami run-up scenarios, the KCDD is entirely inundated during or immediately following intense hurricanes or destructive tsunami.

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1 http://csc.noaa.gov/digitalcoast/tools/slrviewer

2 http://seagrant.soest.hawaii.edu/csp/risk-and-vulnerability-assessment-sea-level-risk-impact-honolulu-hawaii

Parts of the region would experience up to 10-feet of flooding. Within the greater Honolulu area, the study estimate that 87% of the tourism sector, 79% of construction and manufacturing activity, 75% of the health sector, and 81% of retail and wholesale activity are affected by the aggregate flooding. It is unknown what proportion of the loss of economic activity occurs in the KCDD.

The KCDD's waterfront is generally a combination of sea walls and harbors. The two largest impacts to the KCDD as a result of accelerated sea level rise will likely be: 1) more common and persistent flooding, and 2) coastal erosion and damage to protective structures and harbors. Flooding will likely be associated more with groundwater and seawater intrusion into the drainage system, resulting in upwelling from manhole covers, and localized flooding of certain streets (Rotzoll and Fletcher, 2012). However, in the long-term, storm surge overtopping existing seawalls may occur. Storm events will exacerbate flooding.

Persistent flooding within the KCDD will have the effect of 1) further challenging wastewater and drainage systems, and eventually rendering current systems inadequate and 2) causing damage to roads, buildings and other infrastructure (potentially subterranean utilities) not designed for flooding (with both rain and saltwater). The issue of wastewater will tax existing wastewater systems regardless of measures taken at the coast due to the interaction between the water table and storm activities. Damages to infrastructure like roads will require on-going maintenance. While the planned rail transit stations in the KCDD will be elevated, there may be impacts to connectivity with other modes of transportation.

Accelerated sea level rise will also impact existing sea walls, harbors/piers and other coastal infrastructure within the KCDD.

There is sound reason to adopt the sea level rise planning benchmark of 1-foot-by-2050 and 1-meter-by-2100 for Hawaii, based on the previous work of ICAP (Codiga and Wager, 2011). Moreover, there is strong evidence that much of the KCDD will experience persistent flooding by the year 2100 (CGG, 2009). Within the context of the KCDD, however, understanding the longevity of existing and new infrastructure is crucial to decision-making. Thus, a study that builds understanding of the interaction between sea level, critical infrastructure, and population is an important next step.

In this context, it is crucial to understand that the effects of sea level rise are not limited to Kaka`ako; the entire coastline of urban Honolulu, as well as the coastal areas of every island in the Hawaiian archipelago will likely be affected. Thus, decision-making must be focused statewide. With regard to Kaka`ako, sea level rise will likely affect the district regardless of the extent of future development.

4.1.4.2 Sea Level Rise Mitigations

Planning responses to sea level rise are generally to *accommodate*, *retreat*, *avoid*, and *protect* (Walsh et al., 2004). These are all considered forms of climate change adaptation.

Accommodate means to continue occupation of the coastal area, but with adjustments to infrastructure and lifestyle. A common example is to alter building codes such that dwellings are raised enough to allow storm water to travel beneath without substantive damage. Another example is the use of "green infrastructure" such as park areas that are designed to accommodate flooding.

Retreat is the antithesis of accommodate. It implies abandonment of the coastal area by moving infrastructure and peoples. This can mean both the moving of existing infrastructure as well as abandoning and rebuilding in less vulnerable areas. This can occur quickly or slowly, as well as dramatically change location or just mildly. A more mild form of retreat is simply to increase setback laws for new development. Other mechanisms include policies such as rolling easements and government purchase of vulnerable properties (California State Lands Commission, 2009).

Avoidance is a form of "slow retreat," where new development is not allowed in vulnerable coastal areas. Over time, as the old infrastructure reaches the end of its useful life, this effectively results in the relocating of infrastructure and peoples to less vulnerable areas.

Protection entails defending vulnerable areas with engineering-based solutions. This includes "soft" measures such as beach and dune restoration as well as more "hard" measures such as building seawalls, levees, and revetments. Enhancing drainage systems, mainly through pumping, also offers a form of protection.

The decision to accommodate, retreat/avoid or protect ultimately depends on the value of the threatened land (both natural ecosystems and built), the cost of protection, and the existence of other inhabitable areas (Parkinson and McCue, 2011). In terms of mitigating sea level rise and determining which of the four responses cited above is best suited to the KCDD, planners and relevant agencies should consider several factors.

1) There is a need for a comprehensive vulnerability assessment and mitigation plan for the KCDD. This should include estimates of *exposure*, *sensitivity* and, *adaptive capacity*. This includes robust scenarios of future sea level rise and impacts to the KCDD, which will help to build understanding of "critical thresholds" in the impact of sea level rise to critical infrastructure and population, as well as inform risk and vulnerability in regards to new development.

Discussion: With an approximate 36-year time frame for the 1-foot benchmark, and an 86-year time frame for the 1-meter benchmark, there is still adequate time to undertake a detailed vulnerability assessment and mitigation plan for the KCDD. Such a study is beyond the scope of this EIS. However, it should be implemented within the next decade to ensure that government is able to respond as needed.

2) At a minimum, information on sea level rise and vulnerability for the KCDD should be made public and widely available to developers, prospective home

buyers/renters, and businesses. This would allow private developers and residents to more optimally respond to market signals in regards to risk (for example, to enhance building design). Education and outreach for the expected impacts to the KCDD are needed – particularly because no broader state level adaptation plan current exists.

Discussion: This EIS represents a first-step in this educational process.

3) There should be community engagement in building understanding of risk and resiliency. This is because the concept of vulnerability is somewhat relative – where it is important to understand community needs and willingness to accept risk, as well as have strong mechanisms to educate the community on expected climate change impacts. The iterative decision-making framework described by Sahin and Mohamed (2013) provides a comprehensive approach (see page 11 of Appendix B), though a more traditional collaborative planning strategy could be employed.

Discussion: Again, this EIS represents a first-step in the community engagement process.

4) A study is needed to estimate the potential costs of sea level rise to the KCDD and detailed planning responses. Key considerations are the use of appropriate flood-resilient building materials and design, the upgrading of wastewater and drainage systems within the KCDD as well as road maintenance. Because Kaka`ako is an existing urban area, some of these costs would be born with or without redevelopment or densification. Costs associated with sea level rise will be distributed between state and county government, developers, residents, and taxpayers. These costs, and their distribution, must be understood to aid long-term decision-making.

Discussion: Work has already begun in this area. Planners with New York City's Municipal Transit Authority have been consulted to learn how the MTA has responded to changes in ground water levels as they relate to the city's subway system. Essentially, the subway system was built at a time when groundwater levels were extremely low. Now that they have risen, the City of New York utilizes pumps to reduce flooding in subway tunnels resulting from groundwater intrusion. To that end, daily pumping has become an infrastructure maintenance cost. Sea level rise in Honolulu may have a similar impact on groundwater levels. Thus, the New York City experience will hopefully begin to guide planners in the determination of whether a pumping system would be effective in reducing potential flooding on a regional scale.

Similarly, the retrofitting of storm drains with one-way flaps to allow storm water to drain in a makai direction but prevent ocean water from infiltrating a system in a mauka direction could help mitigate sea level rise impacts in the District. Knowing the extent of such a retrofit and its cost would greatly aid in decisions concerning the feasibility of its implementation.

4.1.4.3 Reduced Precipitation Impacts and Mitigations

Over the long-term, reduced precipitation could result in less recharge of the aquifer. However, the precise relationship cannot easily be quantified because the amount of rainfall lost to runoff is directly related to the intensity of any particular rain event and its duration. The Proposed Action will have no direct, indirect, or cumulative impact upon regional precipitation rates. As a mature urban area, the great majority of the area is developed with impermeable surfaces and served by an extensive storm water drainage system that was installed in the late 1980s. In addition, as a coastal development, the KCDD is too near the shoreline to contribute to the recharge of the aquifer. Therefore, no measures to mitigate reduced precipitation rates are warranted.

4.1.4.4 Increased Storm Intensity Impacts and Mitigations

The Proposed Action will have no direct, indirect, or cumulative impact upon the intensity of storms that affect the KCDD or the larger Honolulu area in the future. Given the character of the development associated with the Proposed Action (largely high-rise construction), new development will not likely be impacted by rainfall and wind associated with storms. To mitigate against the impacts of more intense storms, buildings will continue to be constructed in compliance with prevailing building codes to minimize their vulnerability to storm events.

4.1.4.5 Ocean Acidification Impacts and Mitigations

As the Proposed Action involves no development that abuts the ocean or activities that impact ocean water quality, the Proposed Action will have no direct or indirect impact upon ocean water acidification. Thus, no mitigation measures are warranted. From a broader perspective, the Proposed Action's impacts on regional drainage (and therefore ocean water quality) are addressed in Section 4.11.5 of this chapter.

From a cumulative perspective, the on-going consumption of fossil fuels by the population of Hawai`i, primarily in the form of reliance upon automobiles for transportation and the use of electricity generated by burning of oil and/or coal, will continue to generate green house gases, a portion of which will be absorbed by the Pacific ocean and contribute to acidification.

This activity can be mitigated through the use of alternate forms of transportation, especially pedestrian and bicycle, and increased efforts to generate energy from renewable resources as envisioned in the Proposed Action. The introduction of the ~~HART~~ ***light metro*** rail system in Kaka`ako creates a unique opportunity for alternative forms of transportation in the district. The extent to which current and future residents of the District decrease their dependency upon automobiles for travel will have a corresponding effect upon the reduction in the amounts of green house gases they generate. Similarly, the construction of greener buildings in Kaka`ako will help to reduce electrical energy consumption and increase the use of renewable resources for energy. To that end, the redevelopment of the KCDD presents greater Honolulu with a transformative

opportunity: a community-wide commitment to take collective action to change the way that we live, work, and play for the benefit of not only the neighborhood, the community, the city, or the state, but for the planet.

4.1.4.6 Trade Wind Loss Impacts and Mitigations

A continuing decline in trade wind conditions will primarily impact the general population's ability to endure tropical conditions in the summertime, and will likely lead to increased dependency upon air conditioning, which may result in higher energy consumption. This impact can be mitigated by improved architectural design of new buildings to allow for improved heat transfer and cooling efficiency. The introduction of a seawater cooling system presently proposed for Downtown Honolulu may lead to the implementation of this system in Kaka`ako, which would greatly mitigate the energy demands created by increased reliance upon air conditioning.

4.2 Topography, Geology, and Soils

4.2.1 Affected Environment

4.2.1.1 Topography

With the exception of the mounds that comprise a portion of the Kaka`ako Waterfront Park, the terrain of the KCDD is relatively flat, averaging approximately 5 feet above mean sea level (MSL), and gently slopes toward the coastline. The mounds within the park are landscape features that correspond to the location of an historic landfill.

4.2.1.2 Geology

Kaka`ako is located on the seaward edge of the Honolulu Coastal Plain. Much of the KCDD was originally submerged land.

The geologic substratum of the KCDD consists of emerged fossil reef and sedimentary deposits that formed approximately 120,000 years ago [MacDonald & Abbott; 1970]. Over time, coral reefs were formed during periods of higher sea level, but were eroded by coastal streams as sea levels fell. An analysis conducted for the 2009 Final Supplemental EIS for the Draft Mauka Area Plan indicates that at one time, the former shoreline was located just makai of what is now Queen Street. As sea levels receded in ancient times, a stream channel formed, generally paralleling the shoreline and bisecting the Mauka Area in an east-west direction. Today, the buried channel is filled with soft alluvium to depths of between 40 and 180 feet [HCDA & HUD; 1985].

About 67,000 years ago, volcanic eruptions occurred along the lower slopes of the Ko`olau mountain range in the vicinity of what is today known as Round Top and Tantalus along the western ridge of Mānoā Valley. These eruptions deposited layers of

black sand and cinder along the coastal plain. Random deposits of this black sand and cinder have been found in portions of the Mauka Area.
During historic times, much of the KCDD was reclaimed with soils composed of soft mixtures of sand, silt, and clay extending from the subsurface coral layer to sea level. Over the last century, the area was filled with dredged coral to achieve the existing ground elevation. The limit of the reclaimed area generally extends along the lines indicated in Figure 4-1.

4.2.1.3 Soils

As determined by the Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture, the soils of the KCDD are comprised of three soil types:

- EmA: Ewa silty clay loam, moderately shallow with a zero to two percent slope. Depth to coral limestone is approximately 20 to 50 inches.
- MkA: Makiki clay loam, dark brown clay loam 20 inches thick with 10-inch thick subsoil, and containing cinders and rock fragments.
- FL: Fill land, mixed, typically used for urban development and described as "material dredged from the ocean or hauled from nearby areas, garbage, and general material from other areas.

The vast majority of the area is comprised of Fill land. See Figure 4-2.

4.2.2 Potential Impacts and Recommended Measures to Mitigate Them

The Proposed Action will have no significant impact upon the geology of the KCDD, but it may impact the topography of the District. Additional fill material may be imported from elsewhere on O`ahu as needed in the redevelopment of individual properties. The on-going redevelopment of the District pursuant to the Future Baseline Condition and the Proposed Action provides an additional opportunity to mitigate sea level rise issues to some extent: as individual properties are redeveloped, their at-grade elevation can be raised by the use fill material to create a higher base elevation. Over the long term, raising the base elevation of properties will improve storm water drainage to abutting streets. Eventually, street elevations can also be gradually raised, which would help to the reduction in flooding.

Development associated with the Proposed Action will impact soils in the KCDD as the result of construction activities that will likely include grading, excavation, drilling, and pile driving. Impacts are anticipated to be localized and will be mitigated on a case-by-case basis in accordance with Best Management Practices. Although predominantly composed of fill material, which is considered to be relatively poor quality, the soil characteristics of the KCDD are able to accommodate high-rise development so long as special foundations are developed to support taller structures. Geotechnical analyses will be conducted for each new project preceding development to assess the need for adequate foundation support systems.

Figure 4-1: Historic Coastline

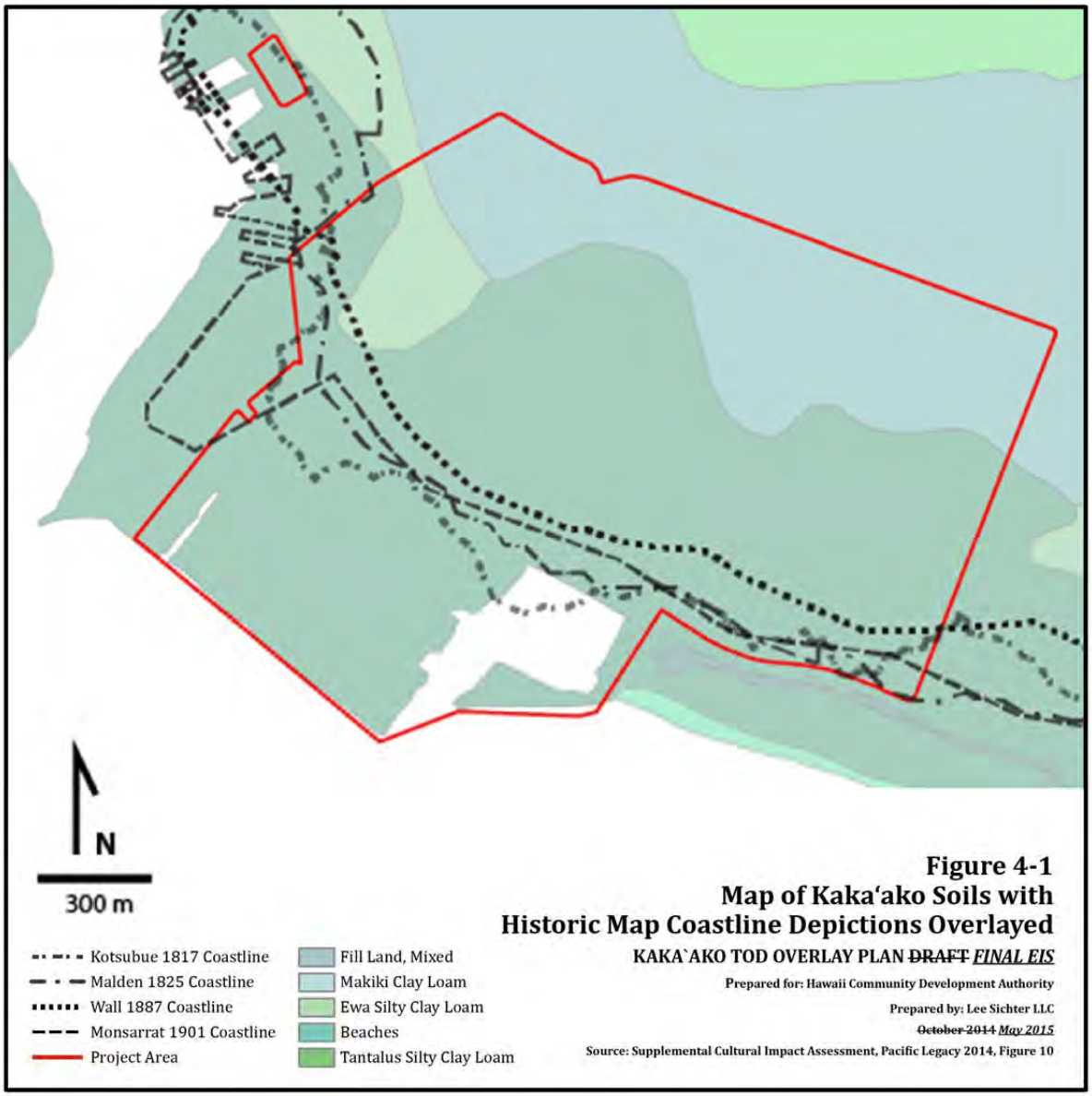
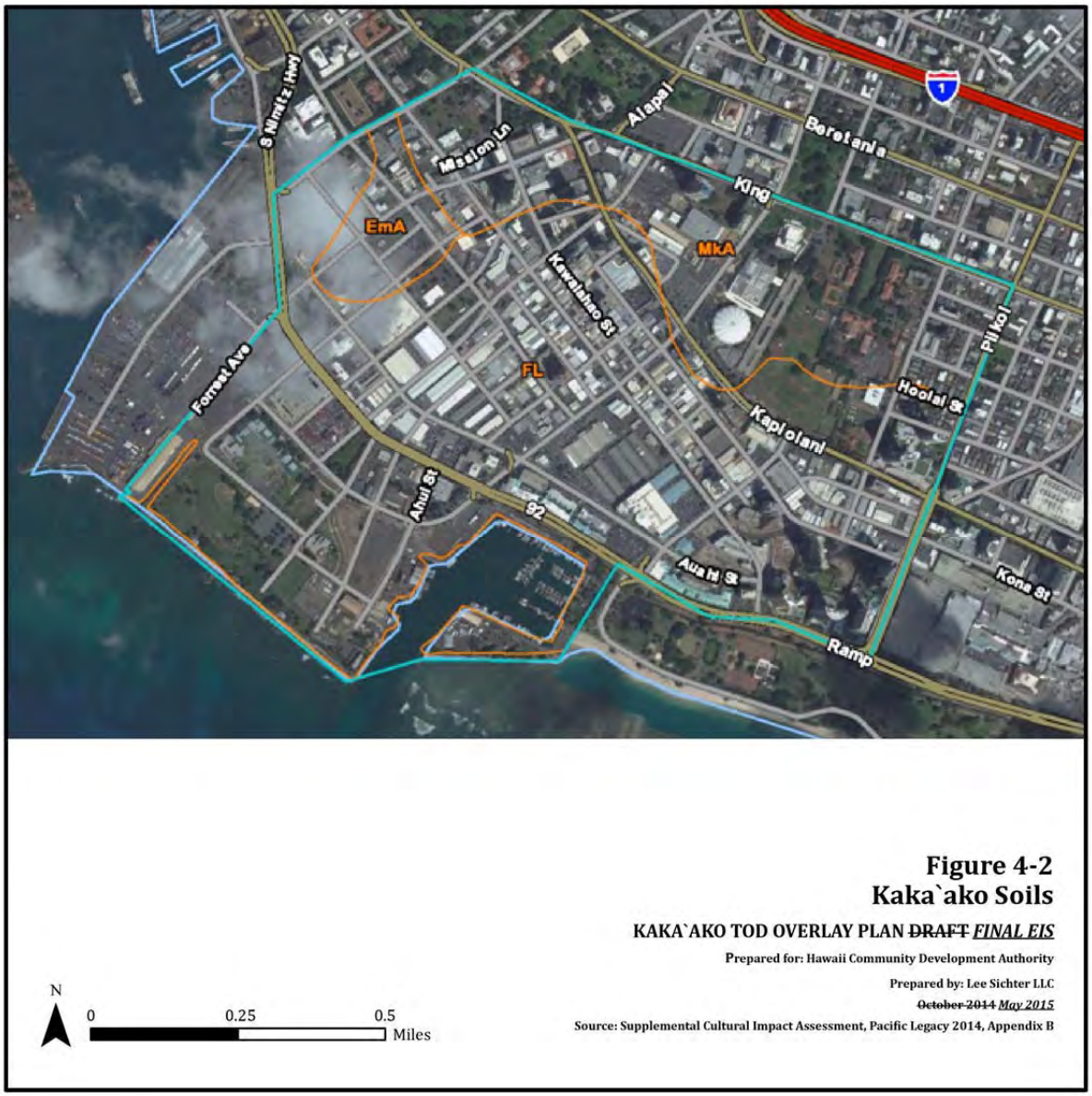


Figure 4-2: Kaka`ako Soils



As evidenced by construction in Downtown Honolulu, especially in areas makai of Queen Street, high-rise development is not constrained by the presence of subsurface fill material. Generally speaking, Queen Street delineates the Honolulu shorefront of the 1830s in Downtown Honolulu. Much of the land there makai of Queen Street is fill and has been successfully redeveloped with high-rise structures.

4.3 Flora and Fauna

4.3.1 Affected Environment

The KCDD is a highly modified urban environment with no significant naturally occurring vegetation. Landscaping accounts for virtually all the vegetation in the area. Fauna is limited to birds and mammals that have adapted to the urban development. There are no endangered or threatened species and no critical habitats with the KCDD.

4.3.2 Potential Impacts and Recommended Measures to Mitigate Them

Development associated with the Proposed Action will result in the loss of some existing landscaped areas and the creation of new landscaped areas. While some vegetation will be permanently lost, this is not considered to constitute a significant adverse impact. No mitigation measures are warranted. If the Proposed Action is implemented as envisioned, the result will likely include a general increase of shade trees along streetscapes and the creation of new open space areas with a variety of landscaped vegetation.

Fauna including birds and mammals will be temporarily displaced by construction activity. This is not considered to constitute a significant adverse impact and does not warrant mitigation. Urban fauna is typically resilient and will adapt to changes in the urban environment. An increase in street trees as envisioned in the Proposed Action will increase habitat for avifauna.

4.4 Natural Hazards

4.4.1 Affected Environment

4.4.1.1 Flooding

In an island environment, flooding can occur from three sources: storm water inundation caused by intense short-term rainfall and/or sustained rainfall; storm surge inundation in coastal areas resulting from higher than normal ocean waves; and tsunami inundation.

Potential flooding hazards are identified by the Federal Emergency Management Agency (FEMA) National Flood Insurance Program and are mapped on the Flood Insurance Rate Maps (FIRM). The maps classify lands into two general zones (Special Flood Hazard Areas and Non-Special Flood Hazard Areas) with more specific and detailed categories in each.

As indicated on FEMA's FIRM Panel 15003C0362G (January 19, 2011), approximately two thirds of the KCDD is identified as being located in Subzone X (a Non-Special Flood Area that has been determined to be outside the 0.2 percent annual chance floodplain). The areas most susceptible to flooding are located around Kewalo Basin and are identified as being located within Subzone AE, with base flood elevations ranging from 6 to 10 feet (see Figure 4-3). Subzone AE is a Special Flood Hazard Area subject to inundation by the 1 percent annual chance flood (100-year flood).

Figure 4-3: Flood Insurance Rate Map (FIRM)

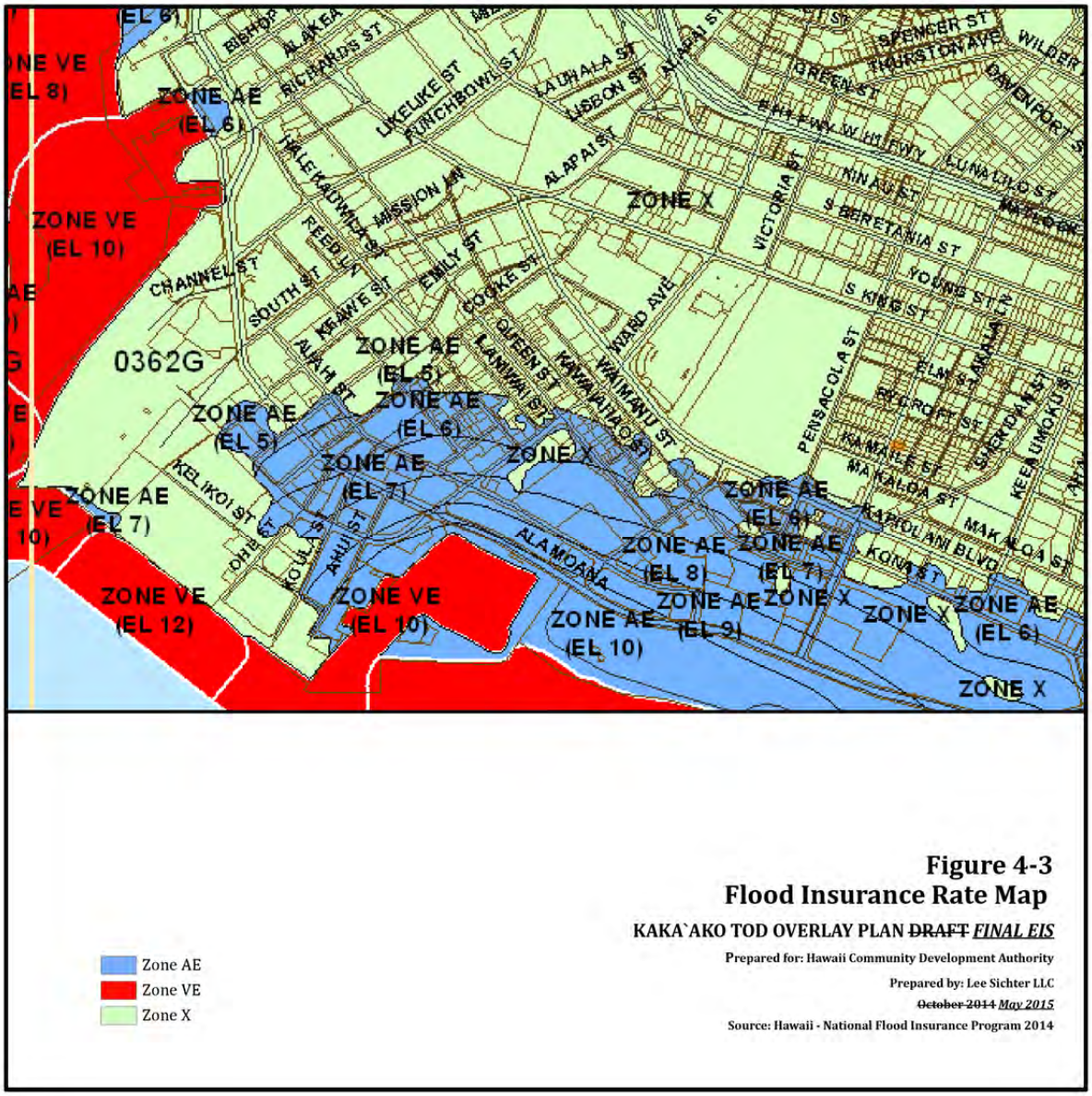


Figure 4-3
Flood Insurance Rate Map

KAKA`AKO TOD OVERLAY PLAN ~~DRAFT~~ *FINAL EIS*

Prepared for: Hawaii Community Development Authority

Prepared by: Lee Sichter LLC

~~October 2014~~ *May 2015*

Source: Hawaii - National Flood Insurance Program 2014

As depicted in the figure above, a large portion of the KCDD lies within the Federal Emergency Management Agency (FEMA) designated Special Flood Hazard Area[3] (SFHA).

The SFHA Zone VE and Zone AE for this particular area were determined by the anticipated impact of floodwaters resulting from a tsunami or hurricane. Zone VE, the coastal high hazard area, has an additional hazard due to storm-induced velocity wave action. Zone VE is located in near shore areas and primarily encompasses Ala Moana Beach Park, Kewalo Basin, and the submerged land offshore of Kaka`ako Makai.

Zone AE, the area within a floodway, extends inland from Zone VE, for distances up to 2,500 feet from the shoreline. Flood elevations within Zone AE were determined by FEMA and range from elevations 5 feet above mean sea level inland to elevation 12 feet at the shoreline. Figure 4-3 graphically shows the extent of: Zone VE, Zone AE and associated flood elevations.

4.4.1.2 Tsunami

A tsunami is a series of very long-period waves that are usually triggered by a disturbance at the seafloor that displaces the water above, typically the result of an earthquake, an undersea landslide, or the eruption of an undersea volcano. These waves can move across the ocean at speeds approaching 500 miles per hour and inundate coastal areas with water reaching several meters in height and causing extensive destruction. Tsunami can also occur locally as the result of a coastal landslide or coastal subsidence event.

On March 11, 2011, an 8.9 magnitude earthquake off the east coast of the Japanese island of Honshu resulted in a tsunami that caused unprecedented damage in Japan and limited damage in Hawai`i. Approximately six hours after the event, tsunami waves ranging in height from three to seven feet reached the Hawaiian Islands. The most significant damage reported in Hawai`i was generally limited to portions of the Island of Hawai`i's northwestern coastline.

Portions of the District have been designated by Hawai`i's Civil Defense Agency as tsunami evacuation areas. While the topography of the Kaka`ako Waterfront Park may serve to some degree as a protective berm for properties mauka of it, the eastern and western sides of the District are exposed to tsunami flow emanating from Honolulu Harbor and Kewalo Basin. In these more exposed areas, the Civil Defense Agency recommends evacuation in response to a tsunami warning.

In mid-November, 2014, the City and County of Honolulu's Department of Emergency Management released draft maps depicting areas on O`ahu that could be inundated by what it terms to be an "extreme" tsunami that could theoretically be generated by a 9.0 earthquake in the Aleutian Islands. Draft Map #19 includes the coastal area extending

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[3] A Special Flood Hazard Area is defined as an area that will be inundated by a flood event having a 1-percent chance of being equaled or exceed in any given year; i.e., 100-year flood.

from the western edge of Honolulu Harbor to the Ala Wai Yacht Harbor. It depicts everything makai of King Street, including the KCDD, being impacted by an "extreme" event.

4.4.1.3 Volcanic Hazards

Hazards associated with volcanic eruptions include lava flows, tephra (airborne particulate matter ejected by a volcano), volcanic gases, and earthquakes (including ground cracks and subsidence). As there are no active or dormant volcanoes on O`ahu, the threat of lava flow inundation is non-existent. The threat of tephra is usually limited to areas immediately downwind of an active eruption, and for that reason, O`ahu is not subjected to tephra hazards. Ground cracks and subsidence of the earth can occur as the result of earthquake activity associated with volcanic eruptions, but these phenomenon are not known to impact O`ahu.

Since the eruption of Pu`u O`o in Puna in 1984, continuous volcanic activity associated with that vent and sporadic activity in recent years at Kilauea crater has resulted in the near constant emission of volcanic gas composed of water vapor, carbon dioxide, and sulfur dioxide in the range of approximately 300 to 700 tonnes per day. During normal trade wind conditions, most of this volcanic gas, known as *vog*, is blown out to sea in a southwest direction. However, during those times when the winds shift to the southeast (blowing southeast to northwest), the plume of *vog* can reach O`ahu, resulting in hazy atmospheric conditions that constitute a health concern for people suffering from acute asthma and lung-related illnesses.

4.4.1.4 Earthquakes and Seismic Activity

Earthquake activity on O`ahu is linked to volcanic activity that is generally focused on the Island of Hawaii and the surrounding seafloor. Earthquakes can occur before or during volcanic eruptions or when magma (molten rock) migrates underground without breaking through to the surface.

The largest known earthquake to occur in the Hawaiian Islands was an event with an estimated magnitude of 7.9 in Ka`u on the Island of Hawai`i in 1868. The next largest event was a 7.2 magnitude event on that island's Kalapana coast in 1975. However, smaller magnitude quakes on the Island of Hawai`i are capable of inflicting damage and disruption as far away as O`ahu. On October 15, 2006, a 6.7 earthquake under the seafloor just offshore of Hualalai mountain on Hawaii Island caused a near total electrical blackout on O`ahu.

The United States Geological Service has designated four seismic hazard zones in the main Hawaiian Islands, ranging on a scale from 1 to 4 with 4 being the most severe. The island of Kaua`i is designated as Zone 1; O`ahu as Zone 2A; Maui County as Zone 2B; and the Island of Hawai`i as Zone 4. [USGS:1997]

4.4.1.5 Landslides, Rock-Falls, and Subsidence

Landslides and rock-falls are typically associated with steep mountainous areas where prolonged rainfall events or strong earthquake activity can dislodge soil from the subsurface rock.

Subsidence, or the sudden collapse of soil in relatively flat coastal areas, is associated with strong earthquake activity. The most recent notable event of subsidence was during the 1972 Kalapana earthquake mentioned above, when a large stretch of Hawai`i Island's Kalapana coastline collapsed several feet, causing an immediate tsunami as the ocean rushed in to replace the void created by the collapsed beach.

Subsidence also occurs regularly along the coast downslope from Pu`u O`o and Kilauea craters on Hawai`i Island where lava drains into the sea. Where the lava enters the sea, it cools and over time forms a large shelf of new land. However, because the shelf is not supported from beneath, once it reaches several acres in size, it tends to break off from the coast and sink. This event has occurred repeatedly over the past two decades but is not known to have resulted in any destructive tsunami.

4.4.1.6 Severe Winds

Air-borne debris dislodged by strong winds can pose a threat to life and property. In Hawai`i, strong winds can be caused by three phenomenon:

- Tropical cyclones, including tropical storms and hurricanes;
- A steep air pressure gradient across the islands resulting from the proximity of a high pressure area; or
- Tornadoes or water spouts that make landfall.

The Hawaiian Islands are situated at the northern edge of the area extending north of the equator that is most closely associated with tropical cyclone activity in the North Pacific. During the period from May 15 to November 30 each year, tropical depressions tend to form in the warm waters off the western coast of Mexico and Central America, and then often move in a west to northwest direction. If climatic conditions are favorable for intensification, the depression can become a tropical storm or eventually a hurricane. In rare instances, these East Pacific storms are able to reach the Hawaiian Islands. However, because of cooler sea surface temperatures around Hawai`i, and due to the summer-time presence of the North Pacific high pressure area several hundred miles north of the islands that generates the trade winds, tropical cyclones originating in the East Pacific usually dissipate before reaching the islands. Nevertheless, the residual moisture associated with dissipated cyclones is an important contributor to summertime rainfall in the islands. Hurricane Iselle, which approached the Island of Hawai`i on August 8, 2014, made landfall as a tropical storm causing significant damage to homes, infrastructure, and vegetation primarily in the Puna District. This storm represented the first landfall of a tropical storm on the Big Island in recorded history.

When tropical cyclones form west of 140 degrees longitude, they are considered to have formed in Hawaiian waters and are given Hawaiian names. While these storms are also exposed to the same influences that help to dissipate East Pacific storms, Hawaiian tropical cyclones pose a greater threat to the islands because of their tendency to form rapidly and move swiftly, resulting in as little as two to three days of warning time, as opposed to the 10 days or more it takes an East Pacific storm to cross the 2,000+ miles to the Hawaiian Islands.

The National Weather Service has established categories of wind speeds as a means of identifying the strength of a tropical cyclone. Tropical storm storm-force winds range in speed from 39 to 73 miles per hour (mph). If wind speeds exceed tropical storm force, the storm is classified as a hurricane. The Saffir-Simpson Hurricane Wind Scale for Hawaii is a 1 to 5 categorization based on the intensity of a hurricane at a particular time. The scale was most recently modified on May 15, 2012.

- Category One: Sustained winds 74-95 mph. Hurricane Iwa (passing just northwest of Kauai in 1982) and Hurricane Dot (landfall on Kauai in 1959) are examples of category one cyclones.
- Category Two: Sustained winds 96-110 mph. There is no record of a category two cyclone directly impacting the Hawaiian Islands.
- Category Three: Sustained winds 111-129 mph. There is no record of a category three cyclone directly impact the Hawaiian Islands.
- Category Four: Sustained winds 130-156 mph. Hurricane Iniki, which made landfall on Kauai in 1992, is an example of a category four cyclone.
- Category Five: Sustained winds greater than 157 mph. There is no record of a category three cyclone directly impact the Hawaiian Islands.

Steep air pressure gradients across the islands can also generate strong winds. As air heats at the equator and rises, causing air pressure at the Earth's surface, it moves north towards the pole. But as it flows north at a high altitude, it cools and begins to sink back to Earth, creating high air pressure at the surface. The phenomenon of tropical air sinking back to Earth occurs around 30 degrees latitude in the North Pacific, several hundred miles north of Hawai`i. As this sinking air is then drawn back toward the low air pressure at the equator, it begins to warm, and when it reaches the equator it rises, creating a perpetual cycle of air, called the Hadley Cell, rising and falling in the atmosphere. The Hadley Cell is predominant during the summer months, giving Hawai`i its trade winds. Although the trade winds are not particularly strong, they can reach speeds up to the high thirties (miles per hour). In leeward areas characterized by south or southwest facing mountain slopes, trade winds speeds can sometimes accelerate downslope and damage roof shingles or unanchored outdoor furnishings.

However, during the winter when the Hadley Cell is less active, winter storms blowing in from the west can occasionally create a low-pressure system west or northwest of the islands. Known as a Kona Low, this wintertime phenomenon is known for delivering strong winds and copious amounts of rain to the islands. Wind speeds associated with

Kona Lows can approach 100 miles per hour. (These storms are not considered to be hurricanes because they do not form as tropical cyclones…and yet, they can have hurricane-force winds.)

At times during the winter season, large low-pressure systems set up west or northwest of the Hawaiian Islands that do not form into Kona Lows. Yet, because nature abhors a vacuum, air from the east is pulled in towards the low; creating a high-pressure gradient across the islands. Strong winds ranging from 50 to 60 miles per hour are associated with this phenomenon, which tends to occur in the period from January to March.

While tornadoes and water spouts have been known to occur in the Hawaiian Islands on rare occasions, they appear to have become more frequent in the past several years, for reasons not fully understood. On O`ahu, tornadoes have been documented in Waipahu and Kunia. Most recently in 2011, a waterspout made landfall in Lanikai on O`ahu, and moved about a mile inland, causing incidental damage before dissipating.

4.4.2 Potential Impacts and Recommended Measures to Mitigate Them

4.4.2.1 Floods and Tsunami

FEMA regulates the development in flood hazard areas as administered by the City's Department of Planning and Permitting. Potential flooding can occur in the 100-year flood plain from flash floods resulting from episodic rainfall, storm surges generated by hurricanes or severe winter storms, or large tsunami events. Flooding can also occur as the result of sea level rise, but ***while*** the likelihood of sea level induced flooding occurring by the 2035 planning horizon is considered at this point in time to be negligible***, it is relevant when considering the overall life of a building constructed during 20-year time frame of this EIS***.

Development associated with the Proposed Action will be susceptible to flooding to the extent it is situated within the 100-year flood plain, or is subjected to unpredictable events of significance such as hurricanes or tsunami. Under both County flood hazard ordinances and requirements of the National Flood Insurance Program, new structures built in regulatory flood plain areas must be elevated or flood proofed to or above the 100-year flood levels established by the Federal Insurance Administration Flood Insurance Rate Map. No habitable spaces are permitted to be built below the identified maximum 100-year tsunami/flood elevations and the lower parts of structures can be designed to withstand bore attack.

A flood study may be required to validate that individual projects will not alter the character of the flood zone within Zone AE impacted areas. FEMA also requires purchase of flood insurance when homes and buildings within SFHAs have mortgages from federally regulated or insured lenders.

Areas outside of Zone VE and Zone AE are classified as Zone X; and are not subject to flood proofing or FEMA flood insurance requirements.

Well-constructed multi-storied buildings have repeatedly demonstrated an ability to withstand tsunami induced flooding. Thus, the redevelopment of Kaka`ako as envisioned by the Future Baseline Condition as well as the Proposed Action will greatly improve the overall safety of the population by providing safe refuge for District residents and workers during tsunami warnings. Enabling people to stay in place during such events, rather than having to evacuate, will help to reduce congestion on evacuation routes. In the event of an "extreme" tsunami, the entire coastal plain of Honolulu, including the KCDD could be impacted. While residents of residential towers could conceivably survive the tsunami event, the chaos and hardships following such a catastrophe would likely equal or exceed the experience of Honshu residents in March 2011.

4.4.2.2 Other Natural Hazards

Volcanic Hazards: As there are no active volcanoes on the island of O`ahu, the KCDD Is not directly threatened by volcanic hazards, including lava flows, tephra falls, or toxic emissions.

Earthquakes and Seismic Activity: The KCDD, with and without the Proposed Action, is susceptible to earthquakes and seismic activity to the same extent as the entire island of O`ahu. Earthquakes of large magnitude can cause catastrophic damage to buildings and infrastructure. Generally, in the United States with its sophisticated building codes and enforcement procedures, earthquake damage is usually associated with events that have a magnitude of greater than 6 on the Richter scale. Each new building constructed as part of the Proposed Action will be obligated to comply with all building code requirements.

Rock fall and Subsidence: Consisting of a coastal plain, the KCDD is not susceptible to rock fall hazards. No incidences of subsidence are known to have occurred in the region, and none are anticipated.

Severe Winds: The KCDD is as susceptible to severe winds as the entire southern coast of O`ahu, including Honolulu, Waikiki, and Kapolei. Multi-story buildings constructed in compliance with building codes, are capable of withstanding wind speeds in excess of 100mph. During severe wind events, usually associated with hurricanes, the principal threat is air-borne debris that can damage break windows, expose building interiors to wind damage, and threaten injury to building occupants, and pedestrians and motorists on the street. Civil defense preparations offer the best opportunity to avoid physical threats to residents. In the event of a severe storm, building occupants are typically advised to seek safe shelter in designated disaster relief centers.

4.5 Archaeological and Historic Resources

4.5.1 Affected Environment

The following information is derived from the Supplemental Cultural Impact Assessment prepared for the Proposed Action (see Appendix C). The KCDD is within the *ahupua`a* of Honolulu and encompasses several smaller *ili* including *Kaka`ako, Kaakaukukui, Kukuluaeo* (along the shore – west to east), and *Kewalo* (mauka of the three *ili*). Thus, the modern area known as Kaka`ako is larger than the traditional named place and now encompasses several other areas whose names are no longer used.

The cultural character of the district is addressed in the following section. With regard to archaeological and historic resources, as a highly urbanized area that has undergone development and redevelopment for well over a hundred years, there are no longer structures in the KCDD that predate or reflect the style of construction employed by Native Hawaiian culture prior to western contact. With the exception of Kawaiahao Church and the Mission Houses, most buildings in Kaka`ako were built in the 20th century. The church and the Mission Houses were built in the 19th century and inspired by the architectural preferences of the 19th century missionaries.

Pre-contact Kaka`ako was a place of recreation and limited habitation; both concentrated along the shoreline. While, no major pre-contact habitation areas have been found in Kaka`ako (it appears, based on previous archaeological work, that all or most the permanent habitation sites were located further inland in the region), post-contact habitation refuse and fill layers are found throughout the Kaka`ako area. Several refuse dumps have been dated to the late 19th and early 20th centuries, when the expansion of street construction east of the main Honolulu urban area brought in businesses and a large number of occupants, some of whom, lived in separate ethnic enclaves.

The likelihood of burials associated with habitation in beach areas is high. Of greater importance is the history of the area over the past 120 years. In the 19th century, the area of Kaka`ako extending east of the Mission Houses was a rural area on the fringe of the seaport of Honolulu. At that time it was sparsely populated and due to its relative remoteness was deemed to be an appropriate location for quarantine and burial. Waves of epidemics that swept through the Hawaiian Islands in the 19th century, along with other factors, reduced the Hawaiian population from about 300,000 (other estimates vary from 100,000 to 1 million) at contact in the year 1778 to only 71,019 native Hawaiians at the end of the 19th century, as counted in the census of 1896. The most devastating of these crises was the 1853 smallpox epidemic, which resulted in 5,748 deaths in a population of about 70,000 in the entire archipelago (discussed in O'Hare et al., 2006). The high number of victims in then-urban Honolulu resulted in many being buried in shallow graves throughout the area of Kaka`ako. Others were buried at cemeteries in Kaka`ako.

Given the area's rich history, it is likely that sub-surface archaeological, historic and/or cultural resources remain. Burials will continue to be found in sand deposits, while others may be found in pumice deposited from ancient eruptions of the crater now known as Punchbowl.

Kaka`ako became the focus of archaeological work during the 1980s as a result of construction of county, state, and federal government buildings and state planned redevelopments (Bush and Hammatt, 2002). A 1987 report titled, "Kakaako: Prediction of Sub-surface Archaeological Resources, Detailing Archival Research and Archaeological Assessment of the Kakaako Community Development District" (Griffin et al., 1987) provided background information and summarized the historical importance of the Kaka`ako area.

In the Mauka Area between Punchbowl Street and Piikoi Street, there are four large historically documented cemeteries: Kaakaukukui Cemetery (site 2918 – eight burials recorded), utilized from the 1700s to the early 1800s; the Honuakaha Smallpox Cemetery (site 3712 – 56 burials recorded), used from 1853-1854; Kawaiahao Cemetery (site 4534 – 129 burials recorded), used from 1875 to 1920; and the King Street Roman Catholic Cemetery (site 5455 – 33 burials recorded), used from the mid-1800s to the 1920s. The full extent of these cemeteries has not been excavated, and there are probably hundreds of burials still within these cemeteries or under modern structures and road alignments.

There is also a cluster of at least 28 historic coffin burials at the Kaka'ako ID 10 area (site 6658), a cluster of 16 coffin burials at the Koolani Condominium project area (site 6911), two coffin burials at the Kaka'ako ID 4 area (site 5598), and two historic burials (one coffin and one with historic grave goods) at the Kaka'ako ID 3 area (site 5280). There is no historic documentation on these small burial areas and their extent or time of use is not fully known. Thus, a total of 274 historic burials have been recorded in some way (recorded *in situ* or disinterred) in the Kaka`ako Mauka Area as of 2009.

An additional 130 burials found (including burials found at Victoria Ward Village Shops project area) were not buried in coffins, or do not have associated grave goods, or consist of partial, previously disturbed burials. Some skeletons were found in a traditional flexed position, suggesting a traditional Hawaiian burial practice. These may date to the pre-contact period or the early post-contact period before the mid 19th century when most Hawaiians adopted Western style burial practices (usually extended within a coffin). Many of these burials cannot be assigned to a specific time period.[4]

Also found within the Mauka Area are wetland/fishpond deposits (sites 6636 and 6856) and historic deposits/trash pits (sites 1973, 3984, 6637, 6639, 6641, 6660, 6766, 9917, and 9991), which usually date around the last decade of the 19th century to the early decades of the 20th century.

Continuing development in the KCDD will occur on a property-by-property basis. As each landowner determines the redevelopment potential of their respective property, they will need to conduct an archaeological inventory survey in the form of sub-surface testing to determine the presence of archaeological, historic, and/or cultural features below the surface.

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[4] Author's Note: out of respect for lineal descendants, no maps of burials or cemeteries are provided.

Table 4-1 presents existing structures in the district identified in the 2009 Final Supplemental EIS for the Mauka Area Plan that are either registered or eligible for registration on the National Register of Historic Places. The State Legislature has declared that these sites of historical or cultural significance be preserved.

With respect to the privately owned historic and cultural sites and buildings on HCDA's list, additional assistance to the owners shall be considered. HCDA shall review and consider the possibility of providing tax incentives, governmental grant-in-aid, and other financial and technical assistance to such owners. HCDA may propose amendments to existing laws and rules to implement these concerns. In addition, other sites of historic and cultural significance within the KCDD may be identified and subsequently added to the HCDA's preservation list.

Properties listed in the National or State Register are afforded the same protection by HCDA as those sites included in the Mauka Area Plan. HCDA requires property owners to obtain a certificate of appropriateness from HCDA before demolishing, altering, or improving any of the abovementioned historic properties. HCDA must grant an application for a certificate of appropriateness if: (1) the proposed action will not hinder the protection and use of the historic property; (2) the property as it exists is totally inadequate for the owner and/or lessee's legitimate needs; or (3) the owner or lessee is unable to earn a reasonable return unless the proposed project is undertaken. The Mauka Area Plan also recommends that HCDA provide grants-in-aid and/or suggest alternatives to proposed projects to encourage property owners to project historic properties. HCDA may also acquire property by eminent domain.

Table 4-1: Sites of Historic or Cultural Significance

Historic Resource	Recommendation	National Register	Hawaii Register	SHIP*
Mission Houses (c. 1821-1830)	Preservation	Yes	Yes	50-80-14-9991
Kawaiahao Church and grounds (c. 1842)	Preservation	Yes	Yes	50-80-14-9991
McKinley High School (c. 1923-1928)	Rehabilitation	Yes	No	50-80-14-9926
Old Kaka`ako Fire Station (c. 1929)	Rehabilitation	Yes	Yes	50-80-14-1346
Mother Waldron Neighborhood Park (c. 1936)	Preservation	No	Yes	50-80-14-1388
Makiki Christian Church (c. 1933)	Preservation	No	Yes	50-80-14-9719
Yee/Kobayashi Store	Restoration	No	Yes	50-80-14-9739
Royal Brewery Building	Preservation	Yes	No	50-80-14-9917

Note: "Preservation" means keeping a property in its present condition. "Rehabilitation" means returning a property to a useful state while preserving significant features.

* State Inventory of Historic Places – site designation number (50 – Hawaii, 80 – O`ahu, 14 – Honolulu Quad)
Source: 2009 Final Supplemental EIS for the Draft Mauka Area Plan, Kaka`ako Community District Development Plan and Rules 1982

In situations where a federal action may impact a historic site listed or eligible for listing on the National Register, a Determination of Effect must be made. The regulations of the Advisory Council on Historic Preservation (ACHP – Code 36 of the Federal Regulations [CFR] Part 800) indicate the procedures that federal agencies must follow to comply with the National Historic Preservation Act (NHPA) of 1966. No federal agency can undertake, fund, issue permits for, or provide loan guarantees to any project that will adversely affect a property eligible for the NRHP without consent of the ACHP in a Memorandum of Agreement.

Section 4.6 below addresses the presence of cultural resources in the district.

4.5.2 Potential Impacts and Recommended Measures to Mitigate Them

Ongoing and future development/redevelopment efforts resulting in excavation may result in the destruction or permanent burial of essentially all of the cultural remains encountered. For at least two thousand years, native Hawaiians have placed the earthly remains and spirits of their *Kupuna* within the landscapes of Hawaii. When a departing *Kupuna* was laid to rest, it was the belief that the remains would empower the descendants until they themselves were buried. The State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources (DLNR) has specific procedures and protocol that must be followed in the event that *iwi* and/or artifacts are uncovered during property excavation or ground disturbance.

To address the potential for impact to archaeological sites, HCDA has implemented a requirement that all developers and applicants consult with SHPD prior to submission of any plans for project eligibility. Developers must comply with the requirements of Chapter 6E-8, 42 and 43 of Hawai`i Revised Statutes, as amended, as well as SHPD Administrative rules. A written letter of concurrence from the SHPD will be required prior to acceptance of an application for project eligibility review. This policy has already been implemented for projects within the KCDD and will continue to be implemented with regard to the Proposed Action.

If any archaeological features are found during construction activities, all work must cease immediately and await SHPD's determination on how to proceed. Additional site-specific archaeological surveys may be required for any improvements that may be undertaken outside the vicinity of a project area. The proper treatment of disinterred *iwi* and artifacts is vital to ensure research and studies related to the site are not inhibited by development activities. In all cases, treatments of any remains or artifacts would be in accordance with procedures required by the Oahu Island Burial Council (OIBC) and the SHPD.

Historic sites listed in the Mauka Area Plan are already listed on either the National Register or the Hawaii Register, and in some cases, both, and are protected by the HCDA permit requirements. Provisions in the Mauka Area and Makai Area Plans supplement, but do not replace other Federal and State programs, procedures, and requirements of historic preservation. Therefore, no adverse impacts are anticipated as a result of implementing the Proposed Action, and consequently, no further mitigation measures beyond those already in place are proposed.

4.6 Cultural Resources, Practices, and Traditions

4.6.1 Methodology

Act 50 (2000) of the Hawai`i State Legislature (ACT 50, SLH 2000) requires that a Cultural Impact Assessment (CIA) be included as part of a Chapter 343 environmental assessment. For the purposes of the current EIS, the cultural resource management firm, Pacific Legacy Inc., was retained to 1) review the scope of previous CIA's conducted for the KCDD or projects therein and determine if they were sufficient for the Proposed Action; and 2) conduct additional cultural impact assessment as needed. Pacific Legacy subsequently conducted a document search to identify any existing CIA performed in or around the Kakaʻako TOD Overlay project area. To do so, the Office of Environmental Quality Control (OEQC) and State Historic Preservation Division (SHPD) Library were researched to find any CIAs conducted for the project area. All archaeological reports, Environmental Impact Statements (EIS), and Environmental Assessments (EA) pertaining to the general area of Kakaʻako were reviewed to determine if any CIA were conducted concordantly. A total of 5 CIAs previously conducted for the project area were identified and are as follows:

- Wilson Okamoto and Associates, Inc., 2002, Cultural Impact Assessment in the Final Environmental Assessment University of Hawaii Health and Wellness Center. Prepared for the University of Hawaii, John A. Burns School of Medicine. Prepared by Wilson Okamoto and Associates, Inc., Honolulu.
- Spearing, Mishalla, Constance O'Hare, and Hallett H. Hammatt, 2008, Cultural Impact Assessment for the Kakaʻako Community Development District Mauka Area Plan, Waikīkī Ahupuaʻa, Honolulu (Kona) District, Oʻahu Island. TMK: [1] 2-1-29-32, 44, 46-56 and 2-3-01-11. Prepared by Cultural Surveys Hawaiʻi, Inc., Kailua
- Vogeler, Kuhio, Lehua Kauhane, and Hallet H. Hammatt, 2010, Cultural Impact Assessment for the Proposed McKinley High School Athletic Complex Master Plan Project, Honolulu (Kewalo) Ahupuaʻa, Honolulu District (Kona Moku), Island of Oʻahu. TMK: [1] 2-3-009:001 por. Prepared by Cultural Surveys Hawaiʻi, Inc., Kailua.
- Genz, Joseph H. and Hallett H. Hammatt, 2010, Cultural Impact Assessment for the Kewalo Basin Repairs Project, Kakaʻako Ahupuaʻa, Honolulu (Kona District), Oʻahu. TMK: [1] 2-1-058. Prepared by Cultural Surveys Hawaiʻi, Inc., Kailua.
- Elison, Mina and Windy K. McElroy, 2011, Final – Cultural Impact Assessment for Kakaʻako, Ahupuaʻa of Waikīkī, Kona District, Island of Oʻahu, Hawaiʻi. TMK: [1] 2-3-006:017. Prepared by Keala Pono Archaeological Consulting, LLC, Hauʻula.

In addition, three ethno-historical investigations and one Traditional Cultural Property (TCP) Study (with its Oral History – Consultation Interview Program component report) performed for areas that occur within or partially within the Kakaʻako TOD Overlay project area were reviewed, including:

- University of Hawaiʻi (UH) 1978, *Remembering Kakaʻako: 1910-1950.* Ethnic Studies Oral History Project, Ethnic Studies Program, University of Hawaiʻi at Mānoa, Honolulu.
- McElroy, W.K., A. Sims, and M. Desilets 2008, *Ethno-Historical Inventory Study of Kakaʻako*. Performed for Kamehameha Schools. Garcia and Associates, Kailua.
- Maly, Kepā, Onaona Pomroy Maly and Kawena Maly. 2013, Draft He Moʻolelo ʻĀina - Traditions and Storied Places in the District Of Kona – Honolulu Region (Lands of Kalihi to Waikīkī), Island of Oʻahu. A Traditional Cultural Properties Study – Technical Report. Prepared for SRI Foundation, New Mexico.
- Elison, Mina 2013, Oral History – Consultation Interview Program – Ahupuaʻa of Kalihi to Waikīkī, District of Kona, Island of Oʻahu. Component to Maly et al. 2013, Appendix D. A Traditional Cultural Properties Study Technical Report. Prepared by Kahiwa Cultural Heritage Consulting with Kumu Pono Associates LLC, Lanai City.

After reviewing and compiling all findings, it was determined that for the purposes of the Proposed Action, additional data collection and assessment was appropriate. Subsequently, Pacific Legacy was directed to prepare a Supplemental CIA (SCIA). The analysis was completed in January 2014 and is presented as Appendix C to this EIS. A summary of its findings is presented in the following sections.

The purpose of the current SCIA is to identify cultural resources and practices, in the broader sense, for areas in and around the Kakaʻako TOD Overlay project area that have not been identified by previously conducted CIAs as determined from the lists above.

Due to its vast area, complex history, population density, as well as rapid land-use changes, Kakaʻako currently has many cultures and sub-cultures that co-exist. There have been a series of demographic changes as well as land use changes in Kakaʻako since its initial pre-Contact settlement that have ushered in new groups and forced out others. In the last fifty years, cultural diversity in Kakaʻako has increased dramatically and is comprised of an array of ethnic groups as well as cultural groups bound by a common custom, belief, or "any other capabilities and habits," (Tylor 1871:1).

Native Hawaiians were the first to settle the area and, therefore, have the longest cultural history in the area. The primary focus of all previous cultural studies for Kakaʻako has been on Native Hawaiians. These assessments have provided a wealth of knowledge about past and present Native Hawaiian land-use of Kakaʻako. However, little attention was paid to other ethnic groups or other cultural groups. Further, no non-ethnic based cultural groups have been represented in previous studies. Many of the cultural resources identified in the SCIA are of significant only to non-Hawaiian cultural groups and are contemporary in nature. It is important to note that cultural resources are no less important for cultural groups that exist today than those utilized by cultural groups in previous eras. Thus, efforts were made in the SCIA to identify contemporary cultural

resources and practices and to be inclusive of all cultural groups in Kakaʻako as well as those that come from other areas to access these unique resources.

According to ACT 50, SLH 2000, an Environmental Impact Statement (EIS) "…should identify and address effects on Hawaiʻi's culture, and traditional and customary rights (ACT 50, SLH 2000: Section 1)." Essentially, a CIA, as a supporting document of the EIS, has the goal of promoting and protecting cultural beliefs, practices, and resources of "Native Hawaiians, other ethnic groups, and groups" (OEQC 1997:1). To date, the term "groups" has been left undefined by the 1997 Office of Environmental Quality Control (OEQC) Guidelines and ACT 50, SLH 2000. However, ACT 50, SLH 2000 goes to some length to stress the importance of this act in promoting and preserving cultural practices and resources of Native Hawaiians and other ethnic groups, stating:

> The legislature also finds that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the "aloha spirit" in Hawaii. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups (ACT 50, SLH 2000: Section 1).

Yet, as declared in Act 50, SLH 2000, the legislation has the stated purpose to:

1) Require that environmental impact statements include the disclosure of the effects of a proposed action on the <u>cultural practices of the community and State</u>; and

2) Amend the definition of "significant effect" to include adverse effects on cultural practices. [emphasis added]

The law remains unclear what defines "community and State" in terms of demographics and cultural groups or its sub-sets. "Hawaiʻi's culture"(ACT 50, SLH 2000: Section 1) and the community of Kakaʻako consists of many cultural groups, centered on common cultural values, beliefs, and interests, including (but not limited to) Native Hawaiian and other ethnic groups. Other cultural groups in the area (e.g. religious, arts, sports, political, commercial, etc.) are united as cultural groups by the special interest that they share, but rarely represent or consist of a single ethnic group. Additionally, these groups regularly commune and organize ceremonial and secular events; exhibiting various hallmarks of a distinct culture. Thus, a CIA should make every effort to include these groups and transcend the constraints of ethnicity. The current SCIA assumes that "groups" include those bound by a common cultural interest, concentrating on those that are recognized as a distinct cultural group by the community. It is intended to supplement the previous CIAs conducted for the area.

4.6.2 Affected Environment

The land to which we now refer to as Kakaʻako has a long and rich cultural history. From traditional Hawaiian accounts, *moʻolelo*, historical documents, and the archaeological record it is evident that this locale has been the backdrop to many significant acts in the long drama of Oʻahu's pre- and post-Contact history. Thorough archival research was

performed by Spearing et al. (2008), Vogeler et al. (2010), Hammatt and Shideler (2010), Elison and McElroy (2011), and Maly et al. (2013), to describe the cultural landscape of pre-Contact to present day Kakaʻako.

The KCDD's current boundaries are a modern construct with no evidence of distinct Traditional or Historic boundaries to affirm them (Spearing et al. 2008; Vogeler et al. 2010; Elison and McElroy 2011). Rather, Kakaʻako is composed of several *inoa ʻāina* (traditional Hawaiian localities), including Kakaʻako, Honokaʻupu, Kaʻākaukukui, Kukuluāeʻo, Kālia, Kewalo, Kou, Kuloloia, Māmala, and Pākākā, that were situated between the two major population centers, Kou (now Honolulu) and Waikīkī.

The original configuration of Kakaʻako's traditional boundaries is unclear, though the area that is widely held as Kakaʻako appears to have grown and morphed significantly since the early European Contact period. Spearing et al. (2008:12) cite the ethnographer and long-time resident of Oʻahu, Henry Kekahuna (1958:4), who placed the western boundary for Kakaʻako "on the Ewa side of Kuloloia Stream where the Honolulu Iron Works and Fort Armstrong are now," an area now covered by One Waterfront Plaza (between South and Punchbowl Streets). Further, Historic maps (Bishop 1884; Monsarrat 1897; Lyons 1872) show Kakaʻako in a variety of configurations if they show the locality at all. Mid 19th century documents and maps describe Kakaʻako as a small *ʻili* located in the *ahupuaʻa* of Honolulu (Spearing et al 2008:12).

4.6.2.1 Traditional Place Names

The area now referred to as Kakaʻako has a long and colorful past. Many *inoa ʻāina* within Kakaʻako were derived from legendary people and events. Some locations have been the backdrop of *moʻolelo* and are, thus, *wahi pana*. In the modern era, these *inoa ʻāina* and *wahi pana* are not always used as place names for the areas that they once described. Westervelt (1915) offers very comprehensive explanations for these ancient place names in *Legendary Places in Honolulu* as does Spearing et al. (2008) and Maly et al. (2013).

Figure 4-3 is a map of the approximate locations of *inoa ʻāina* and *wahi pana* located within the KCDD, which is based upon written descriptions and maps created by The SRI Foundation. **[Please note: an asterisk (*) follows the place-names that appear on the map in Figure 4-4.]**

> **ʻĀina Hou ***
> The land stretching from Pākākā to Kakaʻako (lower Fort Street to Kewalo Basin) on the east side of the harbor was referred to as ʻĀina Hou, according to Kamakau (1961:419).
>
> **ʻĀpua ***
> The place name translates as "woven fish basket," which is shared with its namesake who was a fisherman from the area between Richards, Queen, and Punchbowl Streets (Maly et al. 2013). This location is mentioned in Thrum's (1900) version of the legend of Kūʻula as an area that his son, Aiai stayed

while on his journey in O‘ahu and was the home of his companion Apua, who shares the name.

‘Auwaiolimu

The name ‘Auwaiolimu translates as “water channel of algae or mossy stream” and was the name of the area between the coastal lands of Waikahalulu and Honuakaha, which is now near Hale Kauwila and Queen streets (Maly et al. 2013).

Awalua

Ancient surf break, also called Kaawalua located in the Māmala Channel (Ī‘ī 1959:82).

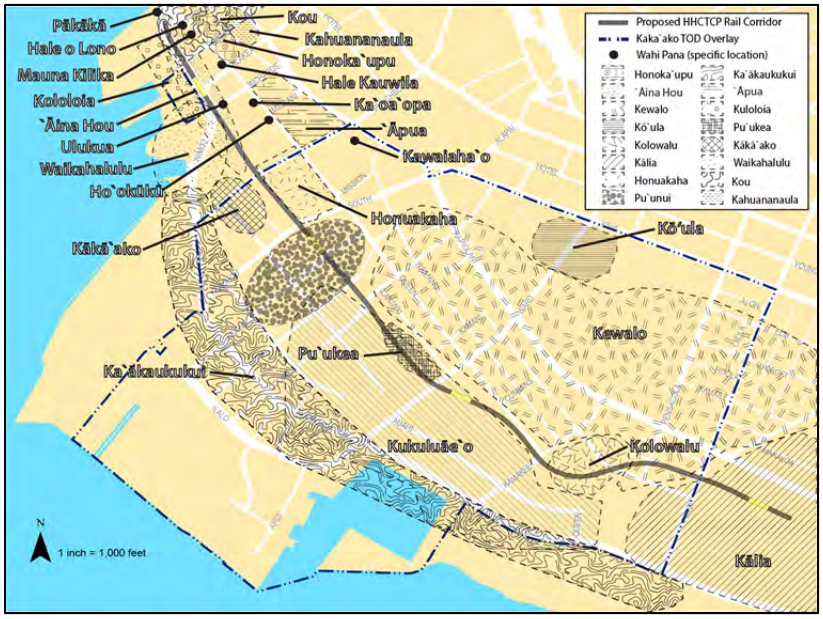
Hale Kauwila *

Hale Kauwila, which means, “house made of *kauwila* wood,” is a Historic era name of the area that connects Pākākā and the old Fort. The name actually referred to one of the large thatched structures near the shore of Kuloloia, which was built for the *ali‘*i [Maly et al. (2013)]. Hale Kauwila is the location where the King and his officials met and made decisions for the Hawaiian Government.

Hale o Lono *

According to Ī‘ī (1959), Hale o Lono was a *heiau* that at one point had been the residence of Liholiho (Kamehameha II). Maly et al. (2013:30) states that Hale o Lono once stood near the corner of Fort and Queen Streets.

Figure 4-4: *Inoa `āina* and *wahi pana* in Kaka`ako



Source: Kaka`ako TOD Overlay SCIA, Pacific Legacy, 2014.

Honokaʻupu *

The ancient locality of Honokaʻupu, which means "Albatross Bay," is named after Chief Honokaʻupu. It is mentioned in Īʻī (1959:91), where he describes it as a bathing pool or spring located "…above Queen Street, north of a pier at the corner where Queen and Alakea Streets now meet..." and states that this property, belonging to Kaiwikokoole, was located near to King Kamehameha's son, Kekuaiwa. To the east of Kou was a pond surrounded by a grove of coconut trees that was named after Chief Honokaʻupu (Westervelt 1915). Īʻī (1991:161) later writes that Honokaʻupu is Kekauluohi's coral stone house located at Pohukaina, which is said by Pukui et al. (1974:187) to have been located behind the Hawai'i State Library. The *Saturday Press Dictionary of Hawaiian Localities* (September 22, 1883:5), stating "Honokaupu Land in Honolulu on Queen Street, and between Fort and Alakea Street" (as cited by Maly et al. 2013:51). Westervelt (1915:4) holds that Honokaʻupu was noted as a court for playing *ulu maika.* Further, the *mele* for Chiefess Mamala, who was the wife of Chief Honokaʻupu, mentions Honokaʻupu as being the location of a small *kōnane* board (Westervelt 1915:52-54). Maly et al. (2013:108) describes Honokaʻupu as a being a trail junction as well.

Honolulu (aka Kou) *

Honolulu, which means "calm/peaceful cove", is the location once referred to as Kou (Maly et al. 2013) and is the name of the *ahupuaʻa* that contains much of Kakaʻako. Westervelt (1915) offers a description of the original location of Honolulu:

"Honolulu" was probably a name given to a very rich district of farm land near what is now known as the junction of Liliha and School Streets, because its chief was Honolulu one of the high chiefs of the time of Kakuhihewa according to the legends. Kamakau, the Hawaiian historian, describes this farm district thus "Honolulu was a small district, a pleasant land looking toward the west, - a fat land, with flowing streams and springs of water, abundant water for taro patches. Mists resting inland breathed softly on the flowers of the hala tree."

Kakuhihewa was a king of Oahu in the long, long ago, and was so noted that for centuries the island Oahu has been named after him "The Oahu of Kakuhihewa." He divided the island among his favorite chiefs and officers, who gave their names to the places received by them from the king. Thus what is now known as Honolulu was until the time of Kamehameha I., about the year 1800, almost always mentioned as "Kou," after the chief Kou who was an "Ilamuku," or "Marshal," under the king Kakuhihewa. "Kou" appears to have been a small district, or, rather, a chief's group of houses and grounds, loosely defined as lying between Hotel Street and the sea and between Nuuanu Avenue and Alakea Street (Westervelt 1915:1-2).

Kamakau (1961) mentions the place name of "Honolulu" as being used during the time of Alapaʻi:

Then Alapaʻi determined to sail to Oahu and take possession of that island; for he had heard that it was without a ruling chief, Pele-io-holani being at that time ruling chief of Kauai. Alapaʻi therefore sailed to Oahu with his chiefs and fighting men, accompanied by the chiefs

of Molokai. Inquiring about the harbors on Oahu, he was told by those skilled in such things that, "Waikiki has a harbor, Waiʻalae has a harbor; these are both good harbors; at Waikiki and Honolulu live most of the chiefs" (Kamakau 1961:71).

This statement of Alapaʻi also mentions that most of Oʻahu's chiefs dwelt in Honolulu. Further, Kamakau (1961:82) refers to the war between Kahekili and Kahahana in 1782 as the "battle of Honolulu." He later writes of Kou as being a harbor of Honolulu in the early Contact period, stating: "But during the early days of the war a couple of foreign ships entered the harbor of Kou at Honolulu, the first to enter that harbor" (Kamakau 1961:168).

Honuakaha *

Honuakaha, which means "marked earth or coastal land," is an area bound by Queen and Punchbowl Streets (Maly et al. 2013), although, Thrum (1922:633) translates it as "flat land." This area was the location of a royal coconut grove and the former residence of Chief Kinau, father of Miriam Kekauonohi. Spearing et al. (2008) cites a legal suit over a *lele* of the Ili of Kaalaa at Honuakaha that consisted of 1.6 acres that were formerly fishpond and dry land (Hawaii Reports 1903:321, 324 as cited by Spearing et al. 2008:40).

Hoʻokūkū *

The area referred to as Hoʻokūkū, which was between Honuakaha and Honokaʻupu, is where a healing heiau and home of Liholiho once stood. Queen Street now runs through the area (Maly et al. (2013).

Huʻehuʻe

The name translates as "overflowing" and represents an area that is bounded by Queen Street and Honokaʻupu (Maly et al. 2013).

Kaʻākaukukui *

Kaʻākaukukui was once a reef that has been covered with fill. The name translates as "the right (or north) light," referring to a navigation landmark for seafarers (Spearing et al. 2008). Kekahuna (1958:4) states that Kaʻākaukukui was "a beautiful sand beach and reef that formerly extended a quarter mile along Ala Moana Park to Kewalo Basin. Other translations of Kaʻākaukukui consist of "radiating place for lamp" (Thrum 1922:635) and "to the right of the lighthouse" (Gessler 1937:187), as the 1869 Honolulu Lighthouse, no longer standing, was east of this location. Kaʻākaukukui was a "jump land" or *lele*, which is a non-contiguous portion of land belonging to an *ʻili*. One lot of the *lele* was located on the coast and the other two were inland (Spearing et al. 2008:15-16).

Maly et al. (2013:32) translates Kaʻākaukukui as "The north/right light," and describes it as a coastal land "east of Waikahahulu, and adjoining Kukuluʻāeʻo." Further, Maly et al. (2013:32) holds that the area, once fronted

by fishponds and salt works, was cited in historical accounts, Māhele Claims 6236, 7712, 7713 and 10605, and Register Map numbers 241, 395, 611, 861, 900, 1090, and 1471.

Spearing et al. (2008) found that Kaʻākaukukui was briefly mentioned in the Hiʻiaka legends, where Hiʻiaka and her companions decided to travel from Puʻuloa (Pearl Harbor) to Waikīkī by canoe after traveling around Oʻahu by trail. While in Puʻuloa, Hiʻiaka met a party who were en route to visit the chiefess Peleʻula in Waikīkī by land trail. Hiʻiaka informed people that she would travel by sea and meet them in Kou. The chant Hiʻiaka recited is as follows:

And what of me, O Honokaʻupu, my love	*A pehea lāau, e Honokaʻupu, kuʻu aloha*
Upon the crest of the surf at Uhi and ʻOā	*I ka welelau nalu kai o Uhi, o ʻŌa*
Eyes in the living realm (night) of oblivion	*ʻO nā makai ke ao (pō) o poina*
Where am I, O my love	*Ma hea lā wau, e ke aloha lā*
Kou is the coral flat	*ʻO Kou ka papa*
Kaʻākaukukui is the pool	*ʻO Kaʼākaukukui ka loko*
Some ʻalamihi indeed	*ʻO ka ʻalamihi aʼe nō*
Wait all day until night	*ʻO ka lā pō iho*
Friends shall meet in Kou.	*Hui aku i Kou nā maka.*

(Hoʻoulumāhiehie 2006a:277; Hoʻoulumāhiehie 2006b:297)

<u>Kaheiki</u>

Kaheki, which means "little flow," is described as a *heiau* of *poʻokanaka* (human sacrifice) class, according to Maly et al. (2013:33) as well as the name of a land area and stream, however, the location is only noted as Honolulu. In "The Career of Boki," Kamakau (1961) describes a large boulder in Kaheiki Stream named Hōʻeu, which was the guardian of Keheiki:

Boki started to work at the makai road leading to Kaʻalaʻa and when he reached the stream of Kaheiki there stood a great rock over the stream blocking the way. Boki was trying to remove it when a man came forward and said, "Hear, O chief! leave that rock alone. The god made this rock a guardian for this place and his house is yonder (pointing upward to Kaheiki). It is a guardian for the house of the god and its name is Hoʻeu. The nature of this rock is that if you move it aside it will make you move to a foreign land and you will no longer live in Hawaii. Lucky for you if a year passes before you depart." Boki's pipe lighters, Hohopa and Hukiki, reproved the man, to whom he answered, "Take care lest you be thrown onto a bed of thistles!" While working on the Luakaha road Boki found a long, pointed rock in his way and was starting to remove it when a divining kahuna named Luʻau who was skilled in pointing out locations came forward and said to him, "Do not disturb this rock; it is named Ku-of-exceeding-great-mana (Ku-manamana) and Rock-of-exceeding-great-mana (Pohaku-manamana). Not even a high chief should disturb that rock, for it covers the waters of Ka-papa-i-kawa-luna which lie below it and supply the waters of Kunawai, Kahoa-kane, Koʻula, and Kewalo." Boki instantly ordered the men to remove the rock, but it extended into the soil so far that when they had dug some ten fathoms down and about the same distance either way, he gave up in despair. Luʻau also showed him Kukui-puka and other kupua objects mauka of this place (Kamakau 1961:292).

In addition, Kamakau (1961:136) tells of a battle between Kahekili and Kahahana in 1783 that was fought at Kaheiki, where the "waters of the stream of Kahe-iki ran red with blood from the heaps of broken corpses that fell into the water; the stream was dammed back with the corpses of those who died in battle."

Kaholoakeāhole

The translation of Kaholoakeāhole is "the running/schooling of the āhole fish," according to Maly et al. (2013:33) and is the "point along the shoreline below Kākāʻako, near where fishermen resided in the time of Kamehameha I."

Kahuananaula *

According to Maly et al. (2013:33), Kahuananaula is the traditional place name of the area "situated between King and Merchant Streets, and bounded between Fort and Alakea Streets."

Kaimukanaka or Umukanaka

Kaimukanaka translates as "the human oven" and is the name of an area and pond in Kaʻākaukukui (Spearing et al. 2008; Maly et al. 2013). The pond is said to be referred to as Kaimukanaka, Umukanaka, or Ka-imu-hai kanaka, all of which appear to be associated with human sacrifice.

Kakaʻako *

Kakaʻako, which means "to strike and gather," is described as a land area situated between Honuakaha and Kaholoakeāhole that contained a fishing village in the pre-Contact era (Maly et al. 2013). There is no meaning given for the place name Kakaʻako in *Place Names of Hawaiʻi* (Pukui et al. 1974). However, Pukui and Elbert (1986:110) provide a translation for the word *kākāʻāko* as "dull, slow." Alternatively, Thrum (1922:639) suggests *kākāʻāko* means to "prepare the thatching," based on the meaning of the name's first half, *kākā*, "to chop, beat, or thresh" and its last half, *ako,* which means "thatch." Spearing et al. (2008) speculate that the name could tie into the fact that tall *pili* grass, used to thatch traditional structures, thrived in salt marshes, such as those in Kakaʻako - provided that Thrum's translation is correct.

In Thrum's (1900:123-128) version of the legend of Kūʻula, Kakaʻako is mentioned as the location that Aiai, son of Kūʻula, stayed for several days and was befriended by a local named Apua.

Kālia *

The name Kālia translates as "waited for," and is a coastal *ʻili* of Waikīkī Ahupuaʻa, once famous for its salt production and fishponds (Maly et al. 2013). This location was also mentioned in Thrum's (1900) version of the

legend of Kūʻula as the location where Aiai first came to on the island of Oʻahu from Molokaʻi.

Several proverbs were found regarding Kālia:

He kai hului ko Kālia. A sea for fishing with a drawnet is the sea of Kālia. (Pukui 1983:71)

This proverb suggests, according to Pukui (1983:71) that the water at Kālia is very shallow.

Ke kai wawalo leo leʻa o Kālia. The pleasing, echoing sea of Kālia.

Pukui (1083) places the sea of Kālia as the current location of Ala Moana (Pukui 1983:186).

Kaʻoaʻopa *

According to Maly et al. (2013:36), Kaʻoaʻopa is a section of coastal land situated between Mokuʻaikaua and Honuakaha. The trail from Kou to Waikīkī ran through this location. Kaʻoaʻopa is also the location where the attendants of Kamehameha II (Liholiho) lived during the reign of Kamehameha I (Maly et al. 2013).

Kauanonoʻula

Roughly located at the intersection of Merchant and Alakea Streets, Kauanonoʻula is said to have been a regular haunt for ghosts. Westervelt (1915:4) holds that Kauanonoʻula, or "rain with the red rainbow," was a place where *wailua* (ghosts) were known to gather "for nightly games and sports." Kamakau (1961) holds that Kauanonoʻula is named for an ancient chiefess, and wife of Honokaʻupu. Kauanonoʻula, translated by Maly et al. (2013:128) as "the red glowing rain" and provides a background story for the name from an article in the *Nūpepa Kuokoa*, "*Kuu Kamaaina i ka ua Kukala Hale*" (January 24, 1919:3). The story is as follows:

It is because of a beautiful chiefess that this place is named Kauanonoʻula. It was there that she and her family resided. This is the chiefess who took Honokaʻupu as her chiefly husband, and it was at this place that they played their favorite game of kōnane. This is why the famous saying came about, "Huhuhui aku nā maka i Kou" (The eyes will meet at Kou) and "Hāhā pōele ka pāpaʻi o Honolulu" (The crabs of Honolulu grope about in the dark).

Here is the tradition: It is said that the kōnane playing area of the chiefs was there by Fort Street, close to Queen Street, where the bank of Spreckles is; and at this place many people, attractive men and women, gathered for these pleasurable kōnane games of the chiefs.

The kōnane board of this story was made from a large kou tree that was taken from a place nearby what is now Kapiolani Park in Waikīkī. And on the board, were marked lines and four corners in which the various pieces were set.

It was in those days that the name, Kou was given to that place, because of the pastime of the chiefs, and the murmuring voices of the sweethearts could be heard about, "Huhuhui aku na makai Kou," that is the saying was spoken there [sic], inviting the desire of those who were entwined in the embrace of love to meet. Auwe!

As night set out its cover, the men and women would begin to ask and seek out their companions and the saying was uttered "Hāhā pōele ka pāpaʻi o Honolulu," [sic] Thus the night was not without the groping hands - So that which was seen is finished (translated by Maly et al. 2013:128).

This story describes the general tone of this location during *kōnane* games as being a party-like atmosphere.

Kawaiahaʻo *

The area in which Kawaiahaʻo Church is located was once the location of a fresh water spring that belonged to a chief named Hao, hence the name Kawaiahaʻo, which translates to English as "The water belonging to Hao," according to Westervelt (1915:3). Pukui et al. (1974) describes Kawaiahaʻo as an *ili* land once noted for its spring and healing waters. Haʻo is mentioned as both a chief and chiefess in accounts for the area (Maly et al. 2013). Kawaiahaʻo is cited in traditional and historical accounts; Māhele Claim 10605, and Register Map No.'s 111 and 900, and 1912 map by Baldwin & Alexander (SRI Foundation 2013:B-8).

Pukui (1988) recaps a *mo olelo* of the Waters of Haʻo, which describes two springs in Kewalo. In this story, two of chief Haʻo's children ran away from their malicious stepmother and hid for a time at Kewalo Spring. This spring is thought to have been near the trail that connected Waikīkī and Kou. When the children heard that the chiefess had sent men to look for them, the children took the trail across the plain to Kou that night, but succumbed to exhaustion and dehydration. At the western end of the trail, near Kawaiahaʻo Church in Kakaʻako is where the children stopped to rest. One of the children had a dream while he slept, where the boy's mother told him to pull up a plant near his feet. After pulling up the plant, a spring was found. This spring came to be known as the Water of Haʻo, or Kawaiahaʻo, after the childrenʻs father (Pukui 1988:87-89).

Ke-kai-o-Mamala

Ke-kai-o-Mamala was the name of a surf break at the outer entrance of the harbor of Kou, which was named after the chiefess Mamala. Westervelt (1915:2) describes the chiefess as a remarkable woman "who loved to play konane Hawaiian checkers drink awa and ride the surf."

Kekaukukui *

Several Historic maps exhibit a location referred to as Kekaukukui, which is said to have been close to Ulakua (Westervelt 1915:4). Kekaukukui was

reportedly a hub for *kōnane* (a type of pebble board game). Westervelt (1915:4) states:

> Kekaukukui was the place where small konane (checker) boards were laid. These were flat stones with rows of little holes in which a game was played with black and white stones. Here Mamala and Ouha drank awa and played konane (Westervelt 1915:4).

Westervelt (1915:4) also holds that Kamehameha V's father, Kekuanaoa, built his home at Kekaukukui.

Kewalo *

Kewalo, which is translated as "the calling," represented a vast *kula* and coastal region, but is now a name that refers to a manmade basin on the coastline of Kakaʻako. Westervelt (1915) provides a glimpse of ancient Hawaiian practices that took place in this area, stating:

> Kewalo was the place where the Kauwa, a very low class of servants, were drowned by holding their heads under water, according to the law known as "Ke-kai-he-hee." "Kai" means "sea" and "hee" means "surf-riding" or "sliding along." The law meant the sliding of the servants under the waves of the sea (Westervelt 1915:3).

He also holds that Kewalo is the nesting place of the owl responsible for initiating the great battle between the legendary owls who gathered from Hawaiʻi to Kauaʻi and chief Kakuhihewa's army. In this story, the protagonist, Kapoʻi, came across pueo eggs as he was gathering pili grass on the slopes of Punchbowl. Kapoʻi collected the eggs for his dinner, but the owl pleaded for Kapoʻi to return the eggs. After the pueo shamed the protagonist and correctly answered the correct number of eggs he found, Kapoʻi gave in to the pueo and returned the eggs. His acquiescence and return of the eggs reflects his acceptance of the owl as his *ʻaumākua*." As Kapoʻi was beholden to the owl, he was commanded to erect a *heiau*, make it *kapu* (sacred), and perform rites there. These actions were strictly prohibited by the ruling chief of Oʻahu, Kekuhihewa. Upon hearing the actions that Kapoʻi took, Kekuhihewa ordered the lawbreaker to be captured and killed upon Kūpalaha Heiau. However, the pueo then amassed an army of owls who successfully freed Kapoʻi from his gruesome fate at Kūpalaha Heiau (Westervelt 1915: 135-137). Kukaeunahiokapueo, which means "the confused noise of owls rising in masses," is the traditional place name of the great battle of the owls (Spearing et al. 2008).

In the legend of Pumaia, Kewalo was the location of a battle in which Pumaia killed all of Kualii's warriors and officers (Fornander 1917:492).

Hua-nui-ka-lā-laʻilaʻi, one of Oʻahu's distinguished chiefs, was born at Kewalo. The following *mele* recorded by Kamakau (1991) describes this event:

ʻO Hua-a-Kamapau ke ʻliʻi	Hua-a-Kamapau the chief
O Honolulu o Waikīkī	O Honolulu, of Waikīkī
I hanau no la i kahua la i Kewalo,	Was born at Kewalo,
ʻO Kālia la kahua	Kālia was the place [the site]
O Makiki la ke ēwe,	At Makiki the placenta,
I Kānelāʻau i Kahehuna ke piko,	At Kānelāʻau at Kahehuna the navel cord,
I Kalo i Pauoa ka ʻaʻa;	At Kalo at Pauoa the caul;
I uka i Kahoʻiwai i	Upland at Kahoʻiwai, at
Kanaloahoʻokau . . .	Kanaloahoʻokau. . .
(Kamakau 1991:24)	

Kolowalu *

Kolowalu, which encompassed a large fishpond, is located within Kukuluāeʻo and abutted the lands of Kālia and Kewalo. Kolowalu is an ancient benevolent law that existed during the reign of Kualii, which is explained by Fornander (1917) as:

> It was strict, unvarying and always just. It was for the care and presentation of life; it was for the aged men and women to lie down in the road with safety; it was to help the husbandmen and the fishermen; to entertain (morally) strangers, and feed the hungry with food. If a man says, "I am hungry for food," feed [him] with food, lest he hungers and claims his rights by swearing the kolowalu law by his mouth, whereby that food becomes free, so that the owner thereof cannot withhold it; it is forfeited by law. It is better to compensate. He who swears must observe the law faithfully, lest he be accountable to the law of the king which he has sworn to observe, and the punishment be upon him. If it is simple robbery of others' food, or of others' property, then severe punishment shall be meted out to the person who violated the law. A transgressor, or one who is about to die, is, under the application of this law exonerated of his death or other penalty. Through the uprightness of his [Kualii's] law, and the honesty with which he administered the government, God preserved him, so that he lived a long life, and his is that notable life spoken of in the annals of the ancient people, of the king of Oahu, who lived four times forty and fifteen years. In the last stage of life he was bent with age and withered, with the eyes reddened and bedimmed; and was carried about in a netting. He died at Kailua, in Koolaupoko, in A.D. 1730, in the one hundred and seventy-fifth year of his life (Fornander 1917:432).

Kou *

The area now referred to as Honolulu (lit. Sheltered or Protected Cove) was traditionally referred to as Kou, due to the fact that *kou* tree groves were prominent features in its landscape. According to Kamakau (1976), Honolulu as the name of a locality originally referred to a *loʻi kalo* (taro patch) located at what is now the intersection of Liliha and School Streets, which bore the name of its caretaker, Honolulu. Because Honolulu was so well loved, Kamakau states "his descendents gave this name to the whole ahupuaʻa" (1976:7). Westervelt (1915:1) holds that there are various translations for the place name of Honolulu, including "Sheltered Hollow" and "abundance of peace." He further states:

> "Honolulu" was probably a name given to a very rich district of farm land near what is now known as the junction of Liliha and School Streets, because its chief was Honolulu, one of the high chiefs of the time of Kakuhihewa, according to the legends. Kamakau, the Hawaiian historian, describes this farm district thus: "Honolulu was a small district, a pleasant land

looking toward the west, — a fat land, with flowing streams and springs of water, abundant water for taro patches. Mists resting inland breathed softly on the flowers of the hala- tree."

Kakuhihewa was a king of Oahu in the long, long ago, and was so noted that for centuries the island Oahu has been named after him "The Oahu of Kakuhihewa." He divided the island among his favorite chiefs and officers, who gave their names to the places received by them from the king. Thus what is now known as Honolulu was until the time of Kamehameha I., about the year 1800, almost always mentioned as "Kou," after the chief Kou, who was an "Ilamuku," or "Marshal," under the king Kakuhihewa. "Kou" appears to have been a small district, or, rather, a chief's group of houses and grounds, loosely denned as lying between Hotel Street and the sea and between Nuuanu Avenue and Alakea Street (Westervelt 1915:1-2).

Westervelt (1915:8) also states that Kou was likely the most prominent place on Oʻahu to play *kōnane,* which is an ancient board game played with pebbles. He describes the *kōnane* hub as being located near to the temple; likely Pākākā Heiau. This is upheld in a proverb from Pukui's *ʻŌlelo Noʻeau*:

Hāhā pōʻele ka pāpaʻi o Kou. The crabs of Kou are groped for in the dark.
(Pukui 1983:50-51)

This proverb refers to one who "goes groping in the dark," but alludes to the days in which the chiefs of Kou held *kōnane* games at the shoreline of Kou, which often lasted into the night, causing the spectators to "grope for their companions" (Pukui 1983:51). The *kōnane* games also drew spectators from all over the island, as is suggested in the next proverb:

Hui aku na maka i Kou. The faces will meet in Kou.
(Pukui 1983:120)

She explains, "We will all meet there, Kou (now central Honolulu) was the place where the chiefs played games and people came from everywhere to watch" (Pukui 1983:120).

<u>Kukuluāeʻo *</u>

Kukuluāeʻo means "to walk on stilts" and shares the name with the Hawaiian Stilt (*Himantopus himantopus*), which would have frequented the marsh area. Pukui et al. (1974) holds that Kukuluāeʻo once fronted Kewalo Basin and described it as being marsh lands with salt ponds and fishponds. Kamakau (1865) states that Kukuluāeʻo was a well-known area in the pre-Contact era with a *heiau* called Puʻukea. Maly et al. (2013) describes the area as near shore.

<u>Kulaokahuʻa</u>

Kulaokahuʻa translates "the plain of the boundary" in Pukui et al. (1974:123). Alternatively, it may be translated as "plain of Kahuʻa," Kahuʻa being the name of a star; or if the *okina* is left out, *kahua* is generally a site for habitation or sports, such as *ʻulu maika* (Pukui and Ebert 1986:113,178). This

area consists of the plain that abuts the northern boundary of the project area, defined in the story of Peapea, famed warrior during the time of Kahahana, in Fornander (1819:458) as "the level section between Waikīkī and Punchbowl." Kulaokahuʻa has been described as barren and dry in several accounts (Gilman 1909:9-91; Fornander 1819:458; Pukui 1983:84-85).

Emerson mentions Kulaokahuʻa in the legend of Hiʻiaka, the goddess Pele's sister as she passed through the area:

> ... Their route lay eastward across the dusty, wind-swept plain of Kula-o-kahu'a - destined in the coming years to be the field of many a daring feat of arms; - then through the wild regions of Ka-imu-ki, thickset with bowlders [sic] - a region at one time chosen by the dwarf Menehune as a sort of stronghold where they could safely plant their famous ti ovens and be unmolested by the nocturnal depredations of the swinish Kama-pua'a. Hi'iaka saw nothing or took no notice of these little rock-dwellers. Her gaze was fixed upon the ocean beyond, whose waves and tides they must stem before they reached and passed Moloka'i and Maui, shadowy forms that loomed in the horizon between her and her goal (Emerson 1915:185-186).

The area has been the backdrop of several pre-Contact *moʻolelo*, such as the stories of Pikoi, the rat hunter, Hanaaumoe, the trickster hero, and the story of the famed runner, Kaohele. Kulaokahuʻa was also the setting of several pre- and early Contact battles (Fornander 1819:474; 496; O'Hare and Hammatt 2004:8-9). Kulaokahuʻa has also been referred to as a sports and game playing field. In *The Islander* (Thrum 1875), Kulaokahuʻa is described as a fair ground in which games are played as well as celebratory events in a proposed exposition for the discovery of Hawaiʻi by Captain Cook in 1778:

> Probably the most practical way for to celebrate the occasion, will be to hold a national fair at Kulaokahua grounds in Honolulu, which exhibit all possible Hawaiian resources; which exhibition may be supplemented with sports, match games of ball, boat and canoe racing, &c., &c., [sic] military and other parades, and exercises of a more literary and artistic character, -addresses and music. There is little doubt but that the whole population, natives and foreigners, would enter into such celebration with enthusiasm… (Thrum 1875: Vol. 1; No. 25, p.1).

Thus, the vast plain of Kulaokahuʻa has been well documented in accounts from the pre-Contact era to well into the Historic era.

<u>Kuloloia *</u>

The shore of Kuloloia is mentioned by Thrum in the story of *Aiʻai, Son of Ku-Ula* (Thrum 1900:123-128). In the passage, Aiai walked along the shore of Kulolia to Pākākā and Kapapoko. Maly et al. (2013:42) describes Kuloloia as having been a beautiful sandy beach as well as some of the figures associated with it. Also, a number of *aliʻi* dwelt there and there were *heiau* spread across its shoreline, between Pākākā and Honuakaha. Ī`ī (1959) states that the chiefess Nāmahana lived at the shore of Kuloloia and died in her home.

He adds that one of her nephews present during her death was named Kuloloia in afterwards. A single proverb was found referring to Kuloloia in Pukui (1983):

Ka iʻa maunu lima o Kuloloia. (Pukui 1983:149)	The hand-baited fish of Kuloloia.

As Pukui explains, "Small eels (*pūhi ʻōilo*) that were caught by placing bait on the open palm of one hand with the fingers held wide apart. When the eels came up to take the bait, the fingers were clenched into a tight fist, grabbing the eels tightly by the heads" (Pukui 1983:149). This provides some information on what marine resources were available as well as what fishing methods were used.

Kōʻula *

Kōʻula, which translates as "red sugar cane," was a locality in or adjacent to Kewalo (to the north). Maly et al. (2013:41) cite Kamakau (1865) who stated that these lands were cultivated under the orders of the chief, Hua, who is said to have taken care of his people. This land is located partially within the Catholic Cemetery and the Ward property.

Māmala

Māmala, or Kekaiomamala, is the Traditional name for Honolulu Harbor and translates as "fragmented or broken." This bay was the most prominent waterway and boat landing for Kou. As a result, Māmala was the backdrop of many key events and legends of pre-Contact Hawaiʻi. Māmala Bay was named after the famed chiefess who was known to be an ardent surfer. According to Westervelt (1915),

> Ke-kai-o-Mamala was the name of the surf which came in the outer entrance of the harbor of Kou. It was named after Mamala, a chiefess who loved to play konane (Hawaiian checkers), drink awa, and ride the surf. Her first husband was the shark-man Ouha, who later became a shark-god, living as a great shark outside the reefs of Waikiki and Koko Head. Her second husband was the chief Hono-kau-pu, to whom the king gave the land east of the land of Kou. This land afterward bore the name of its chief, Hono-kau-pu. In this section of what is now called Honolulu were several very interesting places (Westervelt 1915:2).

Several proverbs referring to Māmala were found in Pukui (1983):

He *kai hele kohana ko Māmala*. (Pukui 1983:71)	A sea for going naked is at Māmala.
Ka nuku o Mālama. (Pukui 1983:163)	The mouth of Mālama.
Ke kai ʻau umauma o Māmala. (Pukui 1983:184)	The sea of Māmala, where one swims at the surface.

Ka'ale kuehu o Māmala. The billows of Māmala with wind-blown sprays. (Pukui 1983:235)

To elucidate the first proverb, Pukui (1983:71) holds that "The entrance to Honolulu Harbor was known as Māmala. In time of war the people took off their clothes and traveled along the reef to avoid meeting the enemy on land." The second proverb refers to a shark goddess who once lived in Honolulu Harbor and is who the entrance is named after. The last two proverbs provide some visuals of what the conditions could be at Māmala and what activities occurred there.

Mauna Kilika *

Mauna Kilika, is translated by Maly et al. (2013:44) as "Silk Mountain," which is named for the mounds of silk cloth brought in by foreigners in the Historic era that were often traded for Hawaiian products. Mauna Kilika is also the location of the former residence of Judge Mataio Kekuana'oa on the shore of Kuloloia. Mauna Kilika was later named Hale Kauwila. According to Goodale (1897:5), Mauna Kilika was also referred to as the Armory. It was built in 1840 and was one of the first Government buildings in Honolulu. The building is where the Parliament and Land Commission met and is the location of several historical events, including writing of the first constitution.

Pākākā *

Pākākā, which means "to glide as on the surf," (Andrews 1922:664) is the Traditional name for the coastal lands at the south end of what is now Fort Street (Ī'ī1959). Although the most prominent structure of Pākākā was its *heiau*, several historic accounts speak of houses, likely those of the *ali'i*, being located in the area (Ī`ī 1959:82). In fact, Pākākā was the location in which Ka'ahumanu and Kaumuali'i lived together from 1822-25, before Kaumuali'i died in 1825 (Kamakau 1992:265). The article, "Famous Men of Early Days," in *Fornander's Collection of Hawaiian Antiquities and Folk-lore*, Pākākā is mentioned:

> KEKUAWAHINE was a master hand at deceiving and falsifying; he could turn an untruth into a reality; from correct to incorrect, and so forth. When Kamehameha was residing at Pakaka, Kona, Oahu (that is the place where "White man Jim" lives), at the time that the islands from Hawaii to Niihau were subjugated by him, he was living with his wife, Kaahumanu (Fornander 1917:421).

According to Ī'ī (1959:82) the wharf at Pākākā was where people crowded to greet the canoes and boats of Kaumuali'i upon his arrival to meet with Kamehameha.

Pu'uiki

Pu'uiki translates to "little hill or mound" and is a surf break in Māmala (Maly et al. 2013).

Puʻukea *
Puʻukea, which literally means "white hill," is a *heiau* in Kukuluāeʻo, east of Kaʻākaukukui. This *heiau* is said to have been built for Hua-nui-ka-lā-laʻilaʻi, who was born Hua-a-Kamapau at Kewalo (Kamakau 1991: 24-25). In "A Chant for Kualii," Puʻukea is where *mahiki* grass danced (Fornander 1917:396). Pukui and Ebert (1986) maintain that *mahiki* grass is used to exorcise evil spirits.

Puʻunui *
Puʻunui translates as "large hill or mound" and is a land division in Nuʻuanu that has several coastal *lele* located from Queen Street past Hale Kauwila Street into Kaʻākaukukui and bounded by South and Coral Streets. These *lele* were known to have salt making ponds.

ʻUlakōheo
According to Maly et al. (2013:48), ʻUlakōheo translates as "Red penis head" and is the name for an area located near the shore between situated near the shore and Queen, Maunakea, Nuʻuanu, and Marine Streets.

Ulukua *
Westervelt (1915:3) holds that Ulukua, which was located "near the lumber-yards at the foot of the present Richards Street," was once "the place where idols were made." The waters off of Ulukua is where Kamehameha's single canoe greeted the fleet carrying Kauaʻi's regent, Kaumualiʻi (Īʻī 1959:82). Maly et al. (2013:49) states that Ulukua is the site of the Honolulu Lighthouse, which is no longer standing.

Waikahalulu *
Translated as "roaring water," Waikahalulu is an ʻili between lower Nuʻuanu and Pauoa Streams as well as below Hale Kauwila Street where it meets ʻĀina Hou, Kuloloia, and Kaʻākaukukui (Maly et al. 2013:49). This area is mentioned in the canoe story where Kakae, a descendant of Menehune, needed a canoe to search for her brother. Thus, the Menehune built a canoe for her overnight to help Kakae, but did not get it into the water by daylight and left the canoe in a ditch near Waikahahulu (Beckwith 1970:333). Figure 3 illustrates the approximate locations of the *inoa ʻāina* and *wahi pana* in what is now referred to as Kakaʻako.

4.6.2.2 Traditional *Heiau*

Several *heiau*, varying in scale, antiquity, and purpose, once stood in the area now referred to as Kakaʻako.

Pākākā Heiau
Pākākā Heiau was located west of the south end of Fort Street and was built sometime prior to the reign of Chief Kakuhihewa (Westervelt 1915:8). Kuhoʻoneʻenuʻu, the

principal god of Oahu ruling chiefs, was the god of Pākākā Heiau (Beckwith 1970:29). This *heiau* was also the headquarters for all of Oʻahu's priests and that its walls were "adorned all around with heads of men offered in sacrifice" (Westervelt 1915:8). Thrum (1905:45, 57) also holds that Pākākā Heiau was of the *poʻokanaka* (human head) class and located in Honolulu but the actual site was not found. However, he later states:

> Search for the Pakaka and Kaheiki heiaus mentioned by Kamakau, and classed as pookanaka, has not given satisfactory results, though in a native description of early Honolulu, following the Okuu pestilence of 1804, there was located at Pakaka (known later as Robinson's point), heiaus of a medical class under one Papa, termed "na heiau kahuna lapaau." Kamakau having classed his of this name or location as a sacrificial heiau relieves it from confusion with this medical kahuna school (Thrum 1905:60).

In the "Myth of Haumea as Kamehaikana," (Beckwith 1970:281-282) Kou's ruling chief at the time of Papa and Wākea was Leleho'omao, who attempted to sacrifice Wākea at Pākākā Heiau for his crime of trespassing.

A prominent *kōnane* playing area and famous boulder was located on one side of the *heiau* (Westervelt 1915:8). In the Historic period, Pākākā Heiau came under the ownership of Kinau, mother of Kamehameha V (Westervelt 1915:8).

<u>Kaheiki Heiau</u>

According to Beckwith (1970:332) Kaheiki Heiau "built by the Menehune and presided over by the kahuna who founded the priesthood called Moʻo-kahuna." A foreigner called, Kahanai-o-ke-akua (Adopted by the gods), was raised by Kane and Kanaloa at Waolani heiau before residing at Kaheiki (Beckwith 1970:332). Kamakau (1961:292) reiterates a story where Boki is warned against disturbing a large boulder in the stream that is the guardian of Kaheiki, lest bad luck befall him and to the surrounding areas.

Beckwith (1970:345) summarizes as story told by Westervelt (1915) about a cannibal "dog-man," named Kaupe, who lived at Lihue on Oʻahu. The story of Kaupe involves a great *kahuna* from Kaheiki Heiau. The story is as follows:

> Among dog-men represented as overthrowing the chief of a district and terrorizing the country, the most famous is the cannibal dog-man Kaupe who overthrew the government of Ka-hanai-a-ke-akua (Reared by the gods) and ruled the land from Nuʻuanu to the sea.
>
> Kaupe lives at Lihue on Oahu. He never attacks a high chief but eats some of the people both of Oahu and Maui. At last he crosses over to Hawaii and brings back a chief's son to sacrifice in the heiau at Lihue. The father follows to Oahu and consults Kahilona, the great kahuna at the heiau of Kaheiki just below the hill called today Pacific Heights, which was built by the Menehune and which becomes under Kahilona the center for the moʻo-kahuna class of priests; that is, for kilokilo who read the signs of earth and sky and sea. This kahuna teaches the chief from Hawaii the prayer to recover his son, which runs
>
> "O Ku, O Lono! O Kanaloa! By the power of the gods, by the strength of this prayer, Save us two, save us two!"

> The prayer unfastens the boy's fetters and father and son flee and hide under a rock at Moanalua while Kaupe goes on to look for them on Hawaii. The father learns the prayer for killing an enemy, and overcomes Kaupe on Hawaii (Beckwith 1970:345).

Puʻukea Heiau

The name Puʻukea literally means "white hill" and is said to be a *heiau* built under the management of a chief named, Hua-nui-ka-lā-laʻilaʻi, who hailed from Kewalo. This chief was born under the name Hua-a-Kamapau, but received the name from his subjects for his benevolent rulership (Spearing et al. 2008; Maly et al. 2013).

4.6.2.3 Post-Contact History

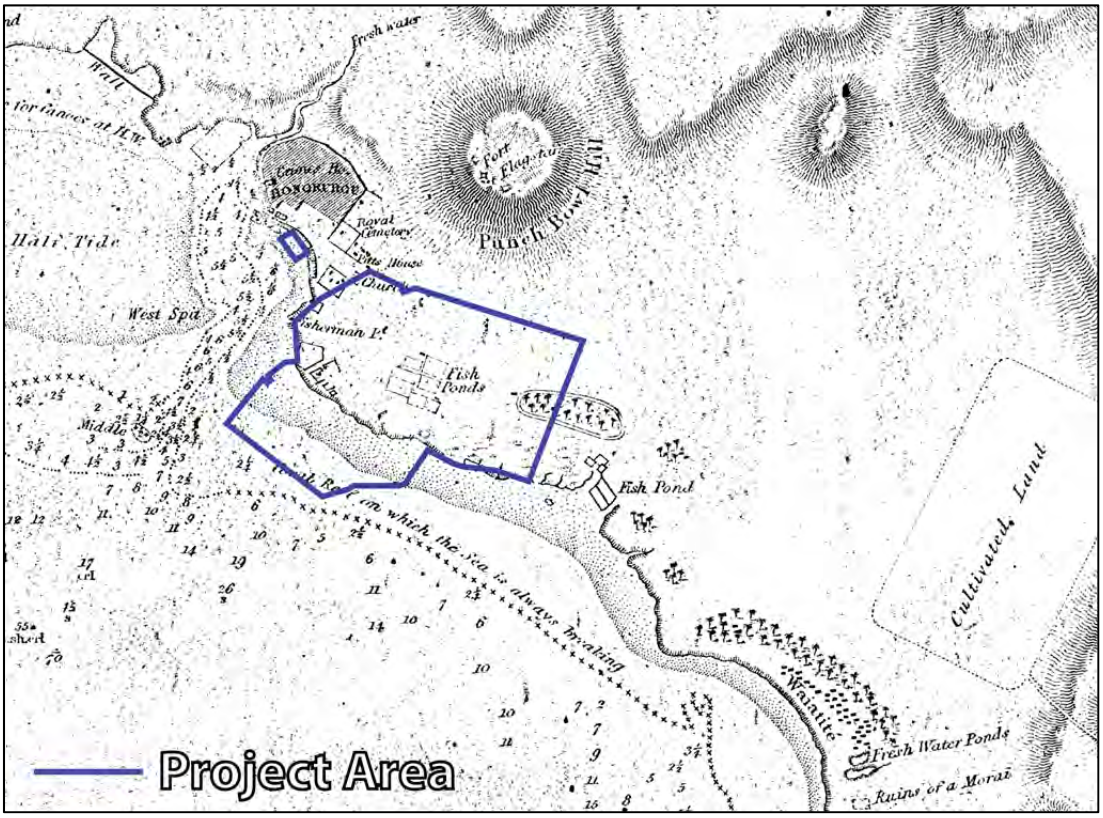
As discussed extensively in the SCIA (see Appendix C), the islands of Hawaiʻi have undergone dramatic changes since their discovery by Native Hawaiians, which is now debated to be no earlier than 1200 years before present (Kirch and McCoy 2007). The arrival of Europeans in the late 1700s sets the scene for a different drama to unfold. After European contact until the present, Kakaʻako has gone through even more radical changes in the physical and cultural landscape due to the decline of the Native Hawaiian population and the increasing influence of Western and Asian immigrants. In this period, Kakaʻako has gone from a hinterland between the two major localities, Kou and Waikīkī, to the governmental seat and recreational area of Oʻahu's royalty and *aliʻi*, subsequently, the urban and industrial heart of the island.

The 19th Century proved to be a time of total transformation for the area now referred to as Kakaʻako. Traditional Hawaiian dwellings, transportation, and cultural practices quickly succumbed to Western customs – forever changing the people and their landscape from Kou to Waikīkī and *mauka* to *makai.*

Figure 4-5 provides a glimpse of what the early 19th Century Kakaʻako vicinity landscape was like. The upper map is a portion of an 1817 map drawn by a European named Kotzebue. The lower map is a portion of a map drawn in 1825 by a European named Malden. Note that both maps depict the coastline at that time to be located in the general vicinity of what is now Ala Moana Boulevard; all of the land makai of today's boulevard appears to have been reef flats that were partially or fully submerged. The 1825 map also shows several fishponds in the central area of what is today the Mauka Area of the KCDD.

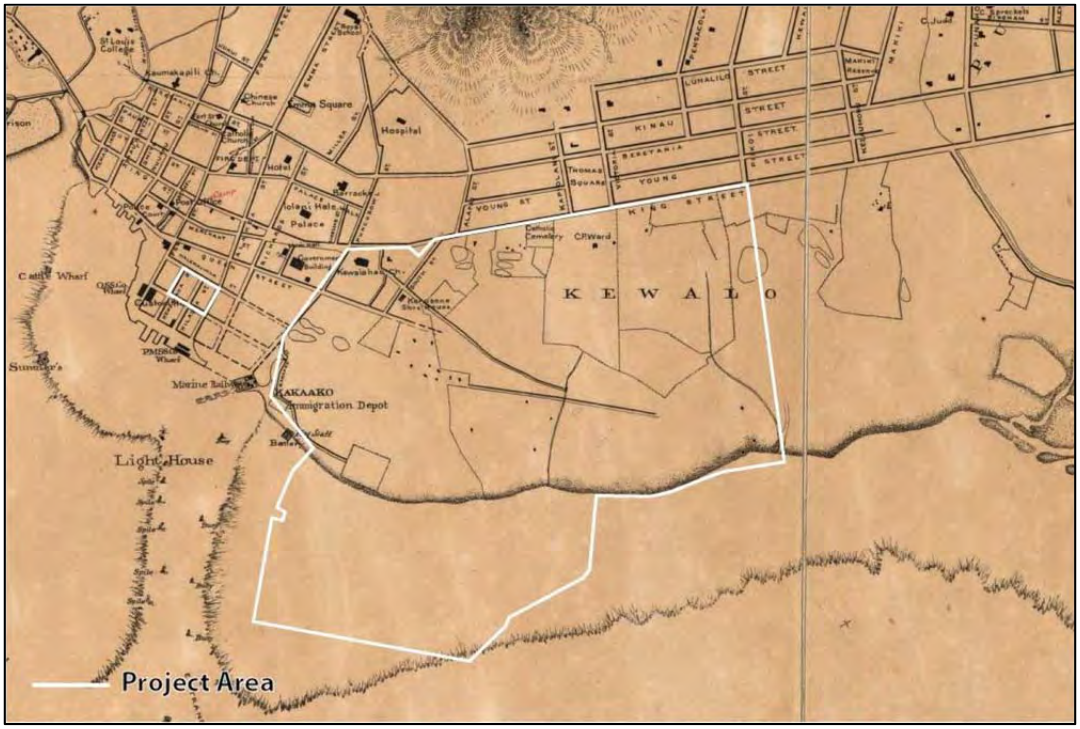
A map produced in 1887 (see Figure 4-6) depicts a dramatic change to the rapidly expanding seaport of Honolulu to the immediate west of Kaka`ako. Yet, with the exception of Kawaiahao Church in the northwest corner, and the extension of Queen Street, the area of Kaka`ako appears to be relatively unchanged from 60 years earlier.

Figure 4-5: Maps of Kaka`ako Area Approximately 100 Years Ago (1817 & 1825)



Source: SCIA 2014 (see Appendix C)

Figure 4-6: Kaka`ako in 1887



Source: SCIA 2014 (see Appendix C)

The distinctive street-grid of downtown Honolulu, as well as the King/Beretania Street corridor is clearly evident in the map above.

Kakaʻako continued to change drastically following the annexation of the islands in 1899 by the United States. Changes in Kakaʻako and surrounding areas were marked by the spread of tenement housing, industry, and infrastructure as well as development on "reclaimed lands" along the coast.

As Honolulu expanded, demand for affordable housing increased, which was partially driven by the exodus of people fleeing the bubonic plague that broke out in Chinatown. Chinatown tenements were destroyed by "controlled burning" to control the outbreak of bubonic plague. After several successful controlled burns, the burn of 20 January 1900 was blown off the prescribe burn area, unintentionally destroying 38 acres of homes and businesses and displacing nearly 6,000 Hawaiian, Japanese, and Chinese. Many of the displaced rebuilt in Chinatown, but the majority settled in tenements built by Bishop, Magoon, and Ward Estates. Joining those relocating from Chinatown were Hawaiians from rural areas and families leaving the plantations for work in Kakaʻako's industrial district, coastal fishing industries, and civic or business jobs in Honolulu. Typically, these new Kakaʻako neighborhoods were ethnically segregated out of convenience and comfort, yet socializing and commerce continued between the ethnic communities (McGregor 1989). By 1940, over 5,000 people of Hawaiian, Portuguese, Chinese, Japanese, and Filipino descent were living in Kakaʻako (Spearing et al. 2008).

However, because these tenements were built with such haste, the communities were not well planned, in terms of health and safety, and structures were substandard. As a result, a cholera outbreak occurred in 1911 as well as a trend of physical and mental deficiencies in Kakaʻako's children. Further, structures quickly became dilapidated and unfit for habitation (McGregor 1989). For a short period, many Hawaiians from Kakaʻako resettled in coastal "squatter" camps; living off the land and ocean much as their ancestors did.

Small industry was also on the rise in early 20th Century Kakaʻako, including fish processing and canning iron works, *poi* processing, flour milling, beer brewing, and brick production. According to McGreggor (1989), the population of Kakaʻako's 600 acres was over 2,500. Small businesses, such as grocery stores, restaurants, meat markets, barbershops, theatres, and specialty shops were established as the neighborhoods grew. Schools, public parks, fire and police stations, municipal buildings, a public landfill and incinerator, animal quarantine and shelter, and improved roadways also followed. In addition to commercial developments, the U.S. military installation, Fort Armstrong, was constructed on the reef of Kaʻākaukukui as part of the Coastal Defense System after the annexation of the islands by the United States in 1899 (Spearing et al. 2008: 52).

The coast and wetlands of Kakaʻako and Waikīkī underwent dramatic changes as well. The "Reclamation" Project was, perhaps, the most transformative event in the area's history. On the face of it, the project was an undertaking to fill in mostly agricultural ponds and wetlands that were supposedly compromising public health by acting as a breeding ground for disease bearing mosquitoes. However, according to Nakamura (1979), this project served to generate capital for Hawaiian construction companies while increasing residential land and land value as well as gentrifying the area by forcing out farmers and underprivileged families. This decade-long project not only transformed the coastlines of Kakaʻako and Waikīkī, but altered the ecology and cultural landscape forever. While most of the coast was extended makai, Kewalo Basin was dredged to expand the small harbor for the lumber industry, which soon gave way for the fishing industry (Spearing et al. 2008).

4.6.3 Relationship of the SCIA to Previous Cultural Studies

Section 4.2 of the SCIA (see Appendix C) presents extensive detail about five previous Cultural Impact Assessments that were reviewed by Pacific Legacy (and were briefly mentioned above).

- Wilson Okamoto and Associates, Inc. 2002, Cultural Impact Assessment in the Final Environmental Assessment University of Hawaii Health and Wellness Center. Prepared for the University of Hawaii, John A. Burns School of Medicine. Prepared by Wilson Okamoto and Associates, Inc.

- Spearing, Mishalla, Constance O'Hare, and Hallett H. Hammatt 2008, Cultural Impact Assessment for the Kakaʻako Community Development District Mauka Area Plan, Waikīkī Ahupuaʻa, Honolulu (Kona) District, Oʻahu Island. TMK: [1] 2-1-29-32, 44, 46-56 and 2-3-01-11. Prepared by Cultural Surveys Hawaiʻi, Inc.

- Vogeler, Kuhio, Lehua Kauhane, and Hallet H. Hammatt 2010, Cultural Impact Assessment for the Proposed McKinley High School Athletic Complex Master Plan Project, Honolulu (Kewalo) Ahupuaʻa, Honolulu District (Kona Moku), Island of Oʻahu. TMK: [1] 2-3-009:001 por. Prepared by Cultural Surveys Hawaiʻi, Inc.

- Genz, Joseph H. and Hallett H. Hammatt 2010, Cultural Impact Assessment for the Kewalo Basin Repairs Project, Kakaʻako Ahupuaʻa, Honolulu (Kona District), Oʻahu. TMK: [1] 2-1-058. Prepared by Cultural Surveys Hawaiʻi, Inc.

- Elison, Mina and Windy K. McElroy 2011, Final – Cultural Impact Assessment for Kakaʻako, Ahupuaʻa of Waikīkī, Kona District, Island of Oʻahu, Hawaiʻi. TMK: [1] 2-3-006:017. Prepared by Keala Pono Archaeological Consulting, LLC.

The project area covered by Wilson Okamoto and Associates, Inc. (2002) is on two parcels, totaling 9.9 acres, bound by Kakaʻako Waterfront Park to the south, Ilalo Street to the north, Fort Armstrong Street to the west, and Cooke Street and Kakaʻako Makai Gateway Park to the east (Figure 11 of Appendix C). Spearing et al. (2008) covers The Kakaʻako Community Development District Mauka Area, which is bound by King Street to the north, Piʻikoi Street to the east, Ala Moana Boulevard to the South, and Punchbowl Street to the south (Figure 12 of Appendix C). The project area covered by Vogeler et al. (2010:17) "…is a portion of the present McKinley High School campus, located north-east of Kapiʻolani Boulevard and between the Neal Blaisdell Exhibition Center on the west and Pensacola Street on the east" (Figure 13 of Appendix C). While the CIA prepared for McKinley High School (Vogeler et al. 2010) was focused on a property within the Kakaʻako Community Development District Mauka Area, which is the subject location for the CIA prepared by Spearing et al. (2008), additional cultural resources were identified by Spearing et al. (2008), as it was conducted more recently. Thus, both were included in the SCIA review. The Genz and Hammatt (2010) CIA focuses on the Kewalo Basin, which is comprised of 22 marine acres of the mixed-use harbor, including the immediately adjacent "reclaimed " lands (Figure 14 of Appendix C). Elison and McElroy (2011) covers the 1.73 acre parcel bound by Waimanu Street to the north, Piʻikoi Street to the east, Ala Moana Boulevard to the south, and Kamakeʻe Street to the west (Figure 15 of Appendix C).

The SCIA presents a composite list of cultural practices and resources identified through the extensive community consultation that occurred during these previous studies (see Table 4-2). The background and community consultations sections of Spearing et al. (2008), Vogeler et al. (2010), and Genz & Hammatt (2010) revealed a number of cultural practices that have occurred and/or are currently occurring in the Kakaʻako TOD Overlay area. As with other sections of these CIAs, a very comprehensive attempt at identifying past and present cultural practices and resources of Native Hawaiian groups was made. However, those of other ethnic groups and groups united by non-traditional Hawaiian cultural practices were scarcely covered. Further, the scope of each report was limited to the project area's boundaries. The following list represents the baseline of cultural resources identified within the KCDD. The following section presents newly identified cultural resources.

Table 4-2: Cultural Practices & Resources Identified in Previous Cultural Impact Assessments

Practice/Resource	Practice/Resource Area	Time Period	Cultural Group	CIA Identifying Cultural Practice
Agriculture (*lo'i kalo, niu,* & non-traditional; animal husbandry)	Various locations within project area	Pre-Contact to Historic	Hawaiians (no longer practiced in area); Ward Family (no longer practiced); Kaka'ako residents (small scale subsistence & supplemental agriculture); Hālau Kū Māna (diverse array of native Hawaiian plants for education & traditional use)	Wilson Okamoto and Associates, Inc. (2002); Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010); Elison and McElroy (2011)
Aquaculture, fishponds (*loko i'a*)	Makai areas of Kaka'ako & Kewalo	Pre-Contact to Historic	Hawaiians (no longer practiced in area)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Archaeological Sites	Various locations within project area (in marked & unmarked locations)	Pre-Contact to Present	Hawaiians, other ethnic groups, & Community members (no specific ethnic group)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Cemeteries & burials (*iwi kūpuna*), traditional Hawaiian & post-Contact	Various locations within project area (in marked & unmarked locations)	Pre-Contact to Historic	Pre-Contact & early Contact Hawaiians (no longer practiced); Historic era no specific ethnic group	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Canoe landing & boat moorage	Kewalo Basin	Pre-Contact to Historic (canoe); Historic to present (boat)	Hawaiians (canoe landing no longer practiced in area); boat moorage practiced by various commercial, cultural, & ethnic groups	Genz & Hammatt (2010)
Ceremony & Religious Congregation	Various locations within project area	Pre-Contact to Present	Hawaiians (no longer practicing at *heiau;* human sacrifice abandoned; Catholic Church groups (Annual Holy Ghost Ceremony)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Feasting (*lū'au*) & traditional food preparation (*aku* drying)	Kewalo Basin area	Undeter-mined to Present	Hawaiians & other ethnic groups	Vogeler et al. (2010); Genz & Hammatt (2010)
Fishing (net & pole)	Kewalo Basin & Ala Moana areas (shoreline & from boats)	Pre-Contact to Present	Fishermen (no specific ethnic group)	Vogeler et al. (2010); Genz & Hammatt (2010)
Fishing, *aku sampan*	Kewalo Basin area	Historic to Present	Fishermen of the *Kula Kai*, last remaining *aku sampan* at Kewalo Basin	Genz & Hammatt (2010)
Fish processing & canning	Kewalo Basin area	Historic	Local, mostly Japanese, Korean, & Filipino	Genz & Hammatt (2010)
Fisherman's Wharf	Bounded by Ala Moana Blvd., Ward Ave., & Kewalo Basin	Historic to Recent years	Community members (no specific ethnic group); tourist & local patrons	Spearing et al. (2008)

Habitation	Various locations within project area	Pre-Contact to Present	Hawaiians & other ethnic groups; modern era no specific ethnic group	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Historic Buildings	Various locations within project area	Historic to present	Community members (no specific ethnic group); commercial groups & individuals	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Memorial statue of Mother Marianne Cope	Kakaʻako Waterfront Park	Modern/ Present	Community members (no specific ethnic group)	Genz & Hammatt (2010)
Memorial statue of the *Pueo ʻAumākua*	Kakaʻako Waterfront Park	Modern/ Present	Community members (no specific ethnic group)	Genz & Hammatt (2010)
McKinley High School & Memorial statue of President William McKinley	Bound by King St., Pensacola St., Kapiolani St., & Neal S. Blaisdell Center	Historic to present	Community members (no specific ethnic group); current students & alumni	Vogeler et al. (2010)
Mother Waldron Neighborhood Park	Bounded by Halekauwila St., Coral St., Pohukaina St., & Cook St.	Historic to present	Community members (no specific ethnic group)	Spearing et al. (2008); Vogeler et al. (2010);
Plant & *limu* gathering for traditional purposes	Various locations within project area; McKinley High School campus	Pre-Contact to Present	Practitioners of *lāʻau lapaʻau;* gatherers of *pili* & *mahiki* grass (no longer practiced in area)*; limu* for traditional dishes	Spearing et al. (2008); Genz & Hammatt (2010)
Quarantine, human & animal	Kakaʻako Makai	Historic	Past smallpox, cholera, bubonic plague, & leprosy victims (no specific ethnic group); domesticated animals (pets & livestock)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Arms storage, & practice; coastal defense	Kakaʻako Makai	Historic	U.S. Army & Honolulu Rifle Association	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Salt (*paʻakai*) gathering & production (*kai hoʻolulu*)	Much of Kakaʻako & Kewalo	Pre-Contact to Historic	Hawaiians, other ethnic groups, & commercial groups	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Surfing/Body Surfing & Swimming	*Makai* of Kewalo Basin and Kakaʻako Waterfront Park	Pre-Contact to Present	Surfers/Body Surfers, (no specific ethnic group)	Spearing et al. (2008); Genz & Hammatt (2010)
Trails (*ala hele*)	Leading from Waikīkī to Honolulu (Kou) & connecting various communities to each other & resources	Pre-Contact to Present	Hawaiians, other ethnic groups, & Community members (no specific ethnic group)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Storied Places (*wahi pana*) & spiritual land associations	Various locations within project area	Pre-Contact to Present	Hawaiians, other ethnic groups, & Community members (no specific ethnic group)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Ward Farmer's Market	Bound by Auahi St., Ward Ave., Queen St.,	Historic to present	Community members (no specific ethnic group)	Spearing et al. (2008)

	& Kamakee St.			
Waste Management, Historic era	*Makai* areas of Kakaʻako & Kewalo	Historic	Public & municipal	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)

4.6.4 Newly Identified Cultural Resources

Due to the fact that the project area of the Proposed Action is spatially larger than the project areas of the previously conducted Cultural Impact Assessments (CIAs), there were several areas not covered by these assessments (see Figure 17 in Appendix C). It is also noted that cultural resources were not identified for areas adjacent to the previous CIA project areas, which are required to be included in these assessments according to the official CIA guidelines (OEQC 1997).

A number of cultural practices and resources that occur in or adjacent to the project area of the Proposed Action were either overlooked or outside of the scope of previous CIAs, but were identified in the course of the current SCIA. Further, cultural resources valued by non-Traditional and non-ethnic based cultural groups were considered in the current supplemental assessment, as contemporary Kakaʻako is a community of multiple cultures and a hub for cultural activities for the entire island community.

Table 4-3 summarizes the findings of the SCIA. Extensive descriptions and discussion of each individual resource are presented in Section 5 of the SCIA (Appendix C). Figure 4-6 maps the location of the cultural resources identified in the SCIA. (Note: the numbers in the left column of the table correspond to the numbers on the map.) Section 5 of the SCIA also includes summaries of community consultations that were conducted.

Within Table 4-3, cultural resources have been grouped as: Historic Places and Landmarks, Cultural Learning Facilities, Public Parks and Grounds, Memorials and Commemorations, Religious and Spiritual Gathering Places, and Public Art Installation and Entertainment Centers. Collectively and individually, these locations function as cultural resources in a sense that community members frequent them to tap into the institutional knowledge held by members of the same cultural group or sub-group who also frequent the location in addition to the resource (i.e. memorials, art, music, and food) that they identify with. Further, regular and intermittent gatherings by those united by a common tradition, practice, ideal, identity, belief, and/or memory generates an institutional knowledge within the group and serves to perpetuate their cultural practices and values. In some cases, cultural resources are not necessarily tangible in nature, but are locations that serve as repositories for various shared traditions, practices, ideals, identities, beliefs, and memories.

Figure 4-7: Map of Newly Identified Cultural Resources

Newly Identified Cultural Resources:

1 Hawai`i Capitol Historic District
2 HECO Downtown Plant
3 Aloha Tower Complex
4 Falls of Clyde
5 Mabel Smyth Memorial Building
6 Post Office, Customhouse, & Courthouse Building
7 Dillingham Transportation Building
8 U.S. Immigration Office
9 African American Diversity Cultural Center of Hawai'i
10 Diverse Art Center
11 Hawai'i Children's Discovery Center
12 Maritime Museum
13 Nā Mea/Native Books Hawai'i
14 The Refuge (808 Urban)
15 Home of the Brave Tour
16 Kaka'ako Waterfront Park
17 Kewalo Basin Park
18 Kaka'ako Makai Gateway Park
19 Mother Waldron Neighborhood Park
20 Ala Moana Beach Park
21 Irwin Park
22 Thomas Square
23 Ehime Maru Memorial
24 MADD Memorial
25 Nagasaki Peace Bell
26 Florentino Das Plaque
27 First Chinese Church of Christ
28 Kawaiaha'o Church
29 Ke Alaula Oka Malamalama
30 Makiki Christian Church
31 POW! WOW!
32 Neal S. Blaisdell Complex
33 FreshCafe & Loft in Space
34 Vacant Lots & Thoroughfares

(Adapted from Google Earth Map)

Table 4-3: Newly Identified Cultural Resources

Map Location	Resource	Resource Area	Period & Frequency	Comments
Historic Places & Landmarks				
1	Hawai'i Capitol Historic District	57 acre area includes: 20 Historic Structures	1794 - present	Located partially within and adjacent to project area. Includes: Kawaiaha'o Church, Hawaiian Mission Houses, Kapuāiwa Building, Hawai'i State Library, Honolulu Hale, Honolulu Hale Annex (Mission Memorial Building Complex), and State (Territorial) Office Building. These structures are in or adjacent to the project area.
2	Hawaiian Electric Company (HECO) Downtown Plant	222 Ala Moana Boulevard	1929 - present	Architectural resource; in project area
3	Aloha Tower (State Site No. 80-14-9929), Aloha Tower Marketplace & Entertainment Complex	Pier 9, Honolulu Harbor	1926 - present	Architectural resource and Historic events relating to Hawaiian history; adjacent to project area
4	The *Falls of Clyde*	Pier 7, Honolulu Harbor	Ship 1878-present, (in repair)	Maritime and Historical resource; adjacent to project area; No estimated date of reopening
5	Mabel Smyth Memorial Building	corner of Punchbowl St.& Ala Moana Blvd.	1941 - present	Architectural resource and Historic events relating to Hawaiian medical history; in project area
6	Post Office, Customhouse, and Courthouse Building (King David Kalākaua Building)	335 Merchant Street across Punchbowl Street from the project area's western boundary	1922 - present	Architectural resource and Historic events relating to Hawaiian history; adjacent to project area
7	Dillingham Transportation Building	*makai* end of Bishop Street, across from the HECO Downtown	1929 – present	Architectural resource and Historic events relating to Hawaiian history; adjacent to project area
8	U.S. Immigration Office	595 Ala Moana Boulevard	mid-1930s - present	Architectural resource and Historic events relating to Hawaiian history; adjacent to project area

Cultural Learning Facilities				
9	African American Diversity Cultural Center of Hawaiʻi (AADCCH)	1311 Kapiolani Blvd Suite 203	Modern/ present	In project area
10	Diverse Art Center	1034 Queen Street	Modern/ present	In project area
11	Hawaiʻi Children's Discovery Center	111 Ohe Street	Modern/ present	In project area
12	Maritime Museum	Pier 7, Honolulu Harbor	1988-2009	No estimated date of reopening; adjacent to project area
13	Nā Mea/Native Books Hawaiʻi	1050 Ala Moana Blvd, Suite #1000	Modern/ present	In project area
14	The Refuge (808 Urban)	683 Auahi Street	Modern/ present	In project area
15	Home of the Brave Tour	Waimanu Street	Modern/ present	In project area
Public Parks and Grounds				
16	Kakaʻako Waterfront Park (major venue for various cultural activities & events)	Bound by Pier 1 complex; John Burns School of Medicine Campus; Kelikoi St., & Kewalo Basin	Intermittent use	In project area; includes the surf breaks Point Panic, Flies, & Incinerators; fishing and diving, takes place along entire coastline (various fish species)
17	Kewalo Basin Park (significant venue for various cultural activities & events)	End of Kewalo Basin access road, between sea wall & harbor	Intermittent use	In project area; various marine activities associated with coastline of park, including fishing and surfing; harbor is moorage for dinner cruises, parasailing, commercial fishing, glass bottom boats, and jet-ski rentals
18	Kakaʻako Makai Gateway Park (significant venue for various cultural activities & events)	Bound by Cooke St., Ala Moana Boulevard, & Ohe St	Intermittent use	In project area; various activities, from organized events to random usage
19	Mother Waldron Neighborhood Park (significant venue for various cultural activities	525 Coral St.	1937-present; Intermittent use	Site#80-14-1388; a "C & C of Honolulu Art Deco Park"; Within project area; from numerous regularly occurring activities, to major annual events, to random usage of park

	& events)			
20	Ala Moana Beach Park (major venue for various cultural activities & events)	Bound by Kewalo Basin, Ala Moana Boulevard, Ala Wai Harbor, & ocean.	Historic-present; Intermittent use	Adjacent to project area; from numerous regularly occurring activities, to major annual events, to random usage of park
21	Irwin Park (minor venue for various cultural activities & events)	Bound by Aloha Tower Dr., Bishop St., Ala Moana Boulevard, & Fort St.	1930-present; Intermittent use	Adjacent to project area; random usage of park, possible small scale regular usage
22	Thomas Square (minor venue for various cultural activities & events)	925 S Beretania St.	Intermittent use	Adjacent to project area; from numerous regularly occurring activities, to major annual events, to random usage of park
Memorials and Commemorations				
23	Ehime Maru Memorial	Kakaʻako Waterfront Park	2002-present	Tragic sinking of a Japanese educational fishing vessel in 2001; in project area
24	MADD Memorial	Kakaʻako Waterfront Park	Modern / present	Multiple services, random visits; in project area
25	Nagasaki Peace Bell (MLK Day & Anniversary of bombing Aug. 9th)	F. F. Fasi Civic Grounds (South Beretania parking entrance)	1990-present, Annual, 2 ceremonies	Adjacent to project area
26	Florentino Das Commemorative Plaque	Kewalo Basin Park	2011-present	1955 solo 1 year voyage from Kewalo to Philippines; in project area
Religious and Spiritual Gathering Places				
27	First Chinese Church of Christ	1054 South King Street	1929 – present	Regular Sunday service, additional religious and cultural activities held on grounds; Historic structure, likely eligible for NRHP; adjacent to project area
28	Kawaiahaʻo Church	Corner of Punchbowl * King Streets	1840s - present	Regular Sunday service, additional religious and cultural activities held on grounds; Historic structure with NRHP status; in project area
29	Ke Alaula Oka Malamalama (The Bright Morning Rays of the Church of Reasonable Service)	910 Cooke Street	1880s – present	Regular Sunday service in Hawaiian language; hymns in Hawaiian; Historic religious organization

30	Makiki Christian Church (Site No. 80-14-9719)	829 Pensacola Street	1904 – present	Regular Sunday service; service in Japanese language; Historic structure, Historic structure with NRHP status; adjacent to project area
Public Art Installation & Entertainment Centers				
31	POW! WOW!	Between Queen Street and Ala Moana Boulevard	2010 - present	Various locations of murals featuring local and international artists; week long annual festival
32	Neal S. Blaisdell Concert & Exhibition Complex	Bound by S. King Street, Ward Avenue, & Kapiolani Boulevard	1964-present, used intermittently	Three major venues; multiple points of interest; in project area
33	Fresh Café & Loft in Space	831 Queen Street	2009-present, intermittent & regular events	Hosts regular community events; cultural resource for arts community; in project area
34	Vacant Lots & Thoroughfares	Various locations in Kakaʻako	Modern / present	Events include: Art & Flea; Eat the Street; Honolulu Night Market; Honolulu 5K and 1 Mile Keiki Run/Walk; King Kamehameha Floral Parade; Pow!Wow! Hawaiʻi; Three Walls Music Festival

For the current SCIA, numerous community consultations were performed, which focused on several different types of cultural groups representing the cultural landscape of the area that is now considered Kakaʻako (see Section 5 of the SCIA). Cultural groups identified for the SCIA consisted of groups united by ethnicity, religion and spirituality, memorials, arts and entertainment, as well as sports and recreation. A total of 78 cultural groups and cultural informants were contacted for consultation, 29 of which agreed to participate. Participation consisted of 5 referrals to other informants, 7 email communications providing information on cultural resources, 2 informants granting permission to use prior interview data for Kakaʻako, 9 online questionnaire submittals, and 6 interviews. However, one interview was not included as the cultural resource was to be discontinued and one online questionnaire was retracted.

In addition to documentation research and community consultations, five site inspections were performed on the 27th July as well as the 2nd, 10th, 15th, and 22nd of August 2013 by Kimberly M. Mooney of Pacific Legacy, Inc. to determine the extent of cultural usage of the property. These inspections consisted of largely of pedestrian survey and photographic documentation of portions of the project area. The area designated as Kakaʻako Makai and the HECO Downtown Power Plant portion of the Proposed Action's project area were

investigated on 27 July and 15 August 2013. Portions of the area designated as Kakaʻako Mauka was investigated on the 2nd, 10th, 15th, and 22nd of August 2013, sweeping streets generally from *mauka* to *makai* and ʻEwa to Diamond Head.

A total of 34 cultural resources consisting of Historic Places and Landmarks (n=8), Cultural Learning Facilities (n=7), Public Parks and Grounds (n=7), Memorials and Commemorations (n=4), Religious and Spiritual Gathering Places (n=4), and Public Art Installation and Entertainment Centers (n=4) were identified in this assessment. A significant number of cultural resources (n=21) were identified as occurring within the project area and numerous resources occurring in areas adjacent to project area (n=13). Many of these cultural resources are unique locations where events and activities that are vital to various cultural groups are held. While some groups (e.g. contemporary and urban arts groups and the LGBT community) are often discounted by cultural studies due to their contemporary and/or "sub-culture" nature, they exhibit all of the hallmarks or a distinct cultural group. Thus, it was deemed necessary to fully assess what cultural impacts may be caused by the Proposed Action, if implemented.

Taken together, Tables 4-2 and 4-3 present the total number of cultural resources identified that may be impacted by the Proposed Action.

4.6.3 Potential Impacts and Recommended Measures to Mitigate Them

To be inclusive of all cultural groups, including "Native Hawaiians, other ethnic groups, and other groups" (OEQC 1997: 3-4), and to address areas not previously assessed, the SCIA has added over thirty new cultural resources to the existing record of cultural resources for Kakaʻako. The existing record of cultural resources is based upon five Cultural Impact Assessments (CIA), two Ethno-Historical Inventory studies, and a Traditional Cultural Property (TCP) study that have been performed in the Kakaʻako area (UH 1978; Wilson Okamoto and Associates, Inc. 2002; McElroy et al. 2008; Spearing et al. 2008; Vogeler et al. 2010; Genz & Hammatt 2010; Elison and McElroy 2011; Maly et al. 2013).

A total of 34 cultural resources consisting of Historic Places and Landmarks (n=8), Cultural Learning Facilities (n=7), Public Parks and Grounds (n=7), Memorials and Commemorations (n=4), Religious and Spiritual Gathering Places (n=4), and Public Art Installation and Entertainment Centers (n=4) were identified in the SCIA. A significant number of cultural resources (n=21) were identified as occurring within the project area and numerous resources occurring in areas adjacent to project area (n=13).

4.6.3.1 Historic Places and Landmarks

A total of eight Historic Places and Landmarks have been identified that were not previously identified in CIAs performed in the area, consisting of the following seven Historic properties located within or adjacent to the project area: Kawaiahaʻo Church, Hawaiian Mission Houses, Kapuāiwa Building, Hawaiʻi State Library, Honolulu Hale, Honolulu Hale Annex, State (Territorial) Office, Hawaiian Electric Company (HECO)

Downtown Plant, Aloha Tower, *Falls of Clyde*, Mabel Smyth Memorial Building, Post Office, Customhouse, and Courthouse Building (King David Kalākaua Building), Dillingham Transportation Building, and U.S. Immigration Office.

The Hawaiian Capitol Historic District, which contains Kawaiahaʻo Church, Hawaiian Mission Houses, Kapuāiwa Building, Hawaiʻi State Library, Honolulu Hale, Honolulu Hale Annex, State (Territorial) Office, is currently active on the NRHP and State Register of Historic Places (NRHP Reference No. 78001020; State Site No. 80-14-1321); thus, protected by state and federal laws. Located within the project area are Kawaiahaʻo Church and Hawaiian Mission Houses, both of which have historic and contemporary cultural significance. In the case of Kawaiahaʻo Church, cultural practices, such as regular church service, visitation of the cemetery, and ceremonial events continue to be important to the Island-wide community. The Hawaiian Mission Houses are repositories and active interpretive centers that continue to serve the community as well. While the Hawaiʻi State Library, Honolulu Hale, and Honolulu Hale Annex are located outside of the project area, they are important institutions that have been serving the community for over a century. The Kapuāiwa Building and State (Territorial) Office are less important in terms of significant cultural usage in the modern era. As state and federal law already protect these properties, no impact is expected from the Proposed Action. However, visual impacts from encroaching skyscrapers may occur if a sensible distance is not kept from these properties. In addition, access and parking is still an important necessity for the properties that carry contemporary cultural significance, such as Kawaiahaʻo Church, Hawaiian Mission Houses, Hawaiʻi State Library, Honolulu Hale, and Honolulu Hale Annex. Reduction of public parking may be a resultant impact from Kakaʻako TOD Overlay developments. It is recommended in the SCIA that parking and accessibility to these properties is not reduced in project related developments.

The 1929 Hawaiian Electric Company (HECO) Downtown Plant is located in the project area and is not yet recognized by the State of Hawaiʻi or NRHP as a Historic site although it likely is eligible based on its antiquity, architecture, and historic significance. However, there were no signs of contemporary cultural utilization of the property and, therefore, no foreseen impacts as a result of the Proposed Action. It is recommended that the building be protected until the proper authorities evaluate its significance and submit a nomination form to NRHP and/or State Register of Historic Places.

The Aloha Tower, which continues to be an icon for the State of Hawaiʻi, is adjacent to the HECO Downtown Plant portion of the project area. Due to its cultural and historic significance, it has been recognized by its NRHP and State Register of Historic Places status (State Site No. 80-14-9929 and NRHP Reference No. 76000660) for over thirty years. Potential impacts to this property may come in the form of visual impacts from increasing building heights for properties located adjacent or near to the Aloha Tower. Current cultural usage consists of visitation of the interpretive displays within the structure, use of the observation deck located at the top floor of the structure, as well as a variety of commercial activities that occur in the surrounding Aloha Tower Market Place. Parking and access is also important to maintain. It is recommended that parking and accessibility to these properties is not reduced in future developments.

The *Falls of Clyde* is currently moored in waters adjacent to the HECO Downtown Plant portion of the project area as well. The vessel is also registered under the NRHP (Reference No. 73000659) and State Register of Historic Places (Site No. 80-14-9700). While the vessel is under major repairs, thus not accessible to the public, it remains a significant nautical attraction on the coastal landscape. No impacts to the *Falls of Clyde* by the Proposed Action are foreseen. In the event that the vessel is deemed fit for boarding by the public in an interpretive context, access and public parking should fit the demand of visitors.

Located in the southwest corner of the project area is the Mabel Smyth Memorial Building, which is currently registered with NRHP and State Register of Historic Places (Reference No. 93001558; State Site No. 80-14-9765). This structure has not been identified as a cultural resource in previous CIAs. As state and federal law already recognized the building, no project related impacts are foreseen for the structure.
The Post Office, Customhouse, and Courthouse Building (King David Kalākaua Building), Dillingham Transportation Building, and U.S. Immigration Office are properties with NRHP and State Register of Historic Places status and are adjacent to the project area. These properties have not been identified in previous CIA. However, no potential impacts caused by the project are foreseen.

4.6.3.2 Cultural Learning Facilities

A total of seven cultural learning facilities were identified within the Kakaʻako project area of the Proposed Action, consisting of the African American Diversity Cultural Center of Hawaiʻi (AADCCH), Diverse Art Center, Hawaiʻi Children's Center, Maritime Museum, and Nā Mea/Native Books Hawaiʻi. Each learning facility is a unique cultural resource for the community of Kakaʻako and the island-wide community.

The AADCCH is a one-of-a-kind repository of archival documents, researched data, and artifacts pertaining to Africans and African Americans in Hawaiʻi's History. In addition, the facility is a location in which knowledgeable individuals can be accessed for guidance on the subject. The AADCCH is a Non-Profit that currently rents a humble office space for its growing collection, which leaves little room for visitors. While the AADCCH hopes to expand, the rising cost of rent in Kakaʻako may be a huge obstacle in meeting their goal. Therefore, potential impacts from the Proposed Action are increased lease fees. It is recommended in the SCIA that the topic of impacts to contemporary cultural resources, such as AADCCH, be addressed in upcoming discussions regarding the Kakaʻako TOD Overlay project rulemaking. One mitigation measure may be to encourage lessors to offer adjusted rent spaces for this and comparable institutions.

Similarly, the Home of the Brave Tour and museum is an irreplaceable cultural learning facility. This World War II repository has an extensive collection of artifacts and replicas as well as oral histories of the amazing personal experiences relayed to the tour operators by the WWII veterans themselves. As we are losing our WWII veterans at an increasing rate due to "old age," Home of the Brave Tour and museum is a vital cultural resource. Unlike other cultural learning facilities, this facility is dependent on the

structure that it is currently housed, due to twenty years of painstaking modifications to create and incorporate interpretive displays in to the structure. Impacts to the cultural resource would be loss of the current space it is housed in. Community discussions for the Kakaʻako TOD Overlay should involve the topic of impacts to contemporary cultural resources, such as the Home of the Brave Tour and museum, which could bolster support for this valuable institution. It is recommended that project related developments work around the structure and lessors be encouraged to offer adjusted rent spaces for this and comparable institutions.

The Diverse Art Center and The Refuge, run by 808 Urban, are unique urban and street art cultural learning facilities that service the youth and young adults of Kakaʻako and surrounding areas. These organizations are also Non-Profits that provide a safe space for creating art and access to artists for mentorship. The major foreseeable impact to these institutions is loss of leased space in Kakaʻako due to increased rent from project related developments. The SCIA recommendation is to address the topic of impacts to cultural resources during Kakaʻako TOD Overlay community discussions on rulemaking to increase awareness of resources of this nature as important features of Kakaʻako's cultural landscape. One mitigation measure may be to encourage lessors to offer adjusted rent spaces for these and similar institutions.

The Hawaiʻi Children's Center is also an important cultural resource that helps inner city children and children island-wide to interact with other children while interfacing with educational exhibits. Unlike school, this resource is not regimented and allows the parents to participate in the child's experience. One impact would be loss of leased space due to increased rents. Again, the recommended action in the SCIA is to incorporate the subject of contemporary cultural resources in upcoming Kakaʻako TOD Overlay rulemaking discussions, which could bolster support for this valuable institution.

The Maritime Museum was an operable museum until recent years, closing in 2009. As the former museum is not planned to be re-opened in the near future, it is not possible to determine if it will be impacted by the proposed development.

Nā Mea/Native Books Hawaiʻi is another unique cultural resource in Kakaʻako that retails an array of Hawaiiana books and music, arts and crafts, and raw materials to create Traditional Hawaiian crafts. It also hosts free workshops and lectures almost daily in Hawaiian traditions, such as storytelling, music making, *hula*, *lei* making, quilting, etc. Access to *kūpuna* such as those who specialize in various traditional crafts and knowledge is rarely available otherwise. Thus, Nā Mea/Native Books Hawaiʻi should be recognized as a contemporary cultural resource. Potential impacts include increased rents that could force the institution out of Kakaʻako. However, population increases due to project related development might increase store visitation and revenue. One mitigative measure may be to encourage lessors to offer adjusted rent spaces for this and comparable institutions during Kakaʻako TOD Overlay rulemaking discussions.

4.6.3.3 Public Parks and Grounds

Seven public parks and grounds have been identified in or adjacent to the project area, including Kakaʻako Waterfront Park, Kewalo Basin Park, Kakaʻako Makai Gateway Park, Mother Waldron Neighborhood Park/Playground, Ala Moana Beach Park, Irwin Park, and Thomas Square. Kakaʻako Waterfront Park, Kewalo Basin Park, Kakaʻako Makai Gateway Park, and Mother Waldron Neighborhood Park are located in the Kakaʻako project area of the Proposed Action. Ala Moana Beach Park, Irwin Park, and Thomas Square are adjacent to the project area. By design, public open space parks and grounds are cultural resources and vital elements to the community, especially in urban settings.

All identified parks have individual characteristics, providing a particular physical attribute suitable for various specialized activities. A host of activities and events occur at these parks randomly, daily, weekly, monthly, and annually, and range from casual, random visitations to grand events attracting participants from all corners of the island. The general consensus from community consultations is that these spaces are irreplaceable and dear to the community.

As mentioned by CPAC Secretary and Archivist, Michelle Matson, in an email communication,

> "…community leaders and development planners should be mindful that the community deserves the following:
> - maintaining and increasing open park space;
> - maintaining open public access to our established ocean recreational areas;
> - mitigating problems from adverse overcrowding and over-development impacts on cultural and recreational shoreline park uses;
> - addressing ocean water quality concerns from storm water runoffs, as such may adversely impact and endanger shoreline recreation uses; and
> - establishing a critical ocean safety and lifeguard facility to ensure effective first-responder and emergency treatment of shoreline park water users."

She maintains, "…with all of the above being needed and necessary to support the present public recreational population of Kakaʻako Makai, as well as recreational needs of the anticipated population increase of 45,000 additional residents in the Kakaʻako area. Notably, our existing parks are at capacity on weekends and during events, and the National Standard for urban recreational open space to ensure the public health and welfare is 2 to 21/2 acres per 1000 capita (45,000 = 90 acres minimum)…" (Matson 2013)

Therefore, it is recommended in the SCIA that any impacts, such as project related development of park space to accommodate any activity other than public recreation be avoided. Access must remain open to the public and parking should be permanent elements of these parks, especially during large-scale events, to ensure accessibility to those coming from outer communities.

4.6.3.4 Memorials and Commemorations

A total of four memorials and commemorations have been identified for the project area. These include the Ehime Maru Memorial, MADD Victims' Memorial, Nagasaki Peace Bell, and Florentino Das Commemorative Plaque. Each of these cultural resources provides a unique space to remember and honor cherished individuals, victims of tragic events, and/or history makers. All memorials and commemorations are located in the project area, save for the Nagasaki Peace Bell.

Each memorial and commemoration appears actively used or visited by the community and should therefore be preserved in place. Potential impacts would be the removal of these cultural resources or encroachment of objects or structures in the dedicated space around the memorial or commemoration feature. It is recommended in the SCIA that development avoid these spaces.

4.6.3.5 Religious and Spiritual Gathering Places

In total, four long-standing churches in or adjacent to the project area have been identified, including the First Chinese Church of Christ, Kawaiahaʻo Church, Ke Alaula Oka Malamalama (The Bright Morning Rays of the Church of Reasonable Service), and Makiki Christian Church. Each church actively serves the community by providing a distinctive type of ceremonial and religious service, such as sermons in languages spoke in the respective community it represents. In addition, these intuitions are largely housed in Historic era structures that are eligible if not already listed in the NRHP and State Register of Historic Places. Impacts could be decreased access due to lack of parking. It is recommended in the SCIA that these properties be avoided in project related development.

4.6.3.6 Public Art Installation & Entertainment Centers

A total of four public art installation and entertainment centers were identified in this study, including POW! WOW!, Neal S. Blaisdell Concert and Exhibition Complex, FreshCafe & Loft in Space, and various vacant lots & thoroughfares. All of these cultural resources are located within the project area.

POW!WOW! is an annual weeklong event that showcases an array of large urban or street art murals installed throughout Kakaʻako. These murals are significant resources for the arts community as well as the general public who view these murals. The event also provides the opportunity for artists to interact and learn from other artists from around the globe. Potential impacts to this newer institution could be the loss of space for murals due to project related development. It is recommended in the SCIA that the topic of sanctioned public art, such as the art installed during the POW!WOW! events be addressed in upcoming Kakaʻako TOD Overlay rulemaking discussions to ascertain the importance of these cultural resources to the community.

The Neal S. Blaisdell Concert and Exhibition Complex is the main venue on Oʻahu for large-scale performances and exhibitions. This irreplaceable resource has been the home of numerous cultural events throughout its history and will be eligible for NRHP and State Register of Historic Places status in the near future. Impacts may include reduced access due to project related development. It is advised that this important cultural resource be avoided by development that is not supportive of arts and entertainment.

The Fresh Cafe & Loft in Space has become an important venue for up-and-coming artists and aspiring artists of all genres. This space allows artists to collaborate, present art, sell arts and crafts, lecture, learn, and debate all aspects of contemporary art. This creative space/artist think tank could be impacted by raised rent and reduced parking availability due to project related developments. Introducing the topic of project related impacts to contemporary cultural resources is recommended during upcoming Kakaʻako TOD Overlay rulemaking discussions. One mitigation measure may be to encourage lessors to offer adjusted rent spaces for these and similar institutions.

In addition to formal or dedicated areas for cultural activities, there are several vacant lots and thoroughfares that are venues for regular cultural events, perhaps unique to Kakaʻako, such as Art & Flea, Eat the Street, Honolulu Night Market, Honolulu 5K and 1 Mile Keiki Run/Walk, King Kamehameha Floral Parade, Pow!Wow! Hawaiʻi, and Three Walls Music Festival. These events are not dependent on the particular space that they occur on – they simply need open venues. However, these events have become part of the charm and attraction to the area. The main impact to these activities would be loss of space. Addressing the topic of contemporary cultural practices, such as the afore mentioned, as important facets of Kakaʻako's cultural landscape and how they might be impacted by the proposed action during upcoming rulemaking discussions is recommended.

4.7 Traffic

Following is a summary of the analysis of existing conditions and traffic related impacts that was conducted for the purposes of this EIS. The full traffic study is presented in Appendix D. However, the vast majority of the study is presented below.

4.7.1 Methodology of the Traffic Study

The transportation analysis provides an assessment of potential impacts to the following modes of transportation that would result from implementing the Proposed Action:

- Bicycle circulation
- Motor vehicle circulation
- Pedestrian circulation
- Public transit

As discussed in Section 1.6, the planning horizon for the TOD Overlay Plan is 2035. The transportation analysis is based on a comparison of transportation conditions under each of the following three scenarios:

- **Existing Conditions** –A review of existing multi-modal transportation conditions within the study area based on observations and data collected in 2013.
- **Year 2035 Conditions with No Action (Future Baseline Condition)** – An assessment of future multi-modal transportation conditions in the 2035 horizon year, based on planned transportation network changes and anticipated future allowable development under the current adopted land use plan for the area. The Future Baseline Condition constitutes "no action" because it represents what will happen in the district under the existing Rules (without implementation of the TOD Overlay Plan).
- **Year 2035 Conditions with TOD Overlay (Proposed Action)** – An assessment of future multi-modal transportation conditions in the 2035 horizon year, based on proposed transportation network changes and anticipated development under the Proposed Action.

The Oahu Metropolitan Planning Organization (OMPO) travel demand model was utilized to develop 2035 travel demand forecasts for purposes of comparing the Future Baseline Condition and Proposed Action. Forecasts of total daily travel to, from and within the KCDD were derived from the model based on the anticipated land use and transportation network changes. Future-year changes to AM and PM peak hour turning movements at key intersections were also derived from the OMPO model, for purposes of comparing AM and PM Peak Hour traffic operations at key intersections selected for analysis.

A detailed breakdown of existing and future land uses, under the Future Baseline Condition and Proposed Action, was provided to the traffic consultant, Nelson Nygaard, for each transportation analysis zone (TAZ) in the project area. Based on that land use data, the OMPO model was updated for purposes of forecasting travel demand based under both the Future Baseline Condition and Proposed Action.

The Future Baseline Condition was used to provide a point of departure from which to measure the impacts of the Proposed Action. The Future Baseline Condition represents how the KCDD would appear if it were developed in accordance with the prevailing rules by the target year 2035. In other words, it considers the following question: if no action were taken other than the continued implementation of the Mauka Area and Makai Area Rules, what would be the result?

Under the Future Baseline Condition, the KCDD would be built out to the density envisioned by the Mauka Area Plan (2011) and the Conceptual Makai Area Plan (2011). Both the Proposed Action and the Future Baseline Condition investigate the capacity of the KCDD at full build out under existing and proposed regulatory environments. The resulting analysis of traffic conditions will guide actions to mitigate impacts associated with the implementing ordinance for the Draft TOD Overlay Plan (the Proposed Action).

The following principles are presented in the Urban Design element of the Mauka Area Plan. They describe the vision for the KCDD in 2035 under the prevailing rules:

- Create an outstanding pedestrian environment.
- Create a network of green streets.
- Provide a maximum of road connections.
- Connect pedestrian paths across major thoroughfare.
- Strong Mauka-Makai linkage.
- Support the small-lot, mixed-use pattern of Central Kaka`ako.
- Support TOD.

Future Baseline Condition: The Future Baseline Condition assumes that the project site will retain its current development parameters and land uses as allowed under the Mauka Area Rules (2011), Makai Area Rules (2005) and adopted Master Plans for Kamehameha Schools and Ward Center. All existing planning and implementation policies and existing development regulations would continue to guide development decisions for properties within the project area. This scenario would extend negotiated agreements in each of the Master Planned Areas and assumes that no new changes would occur to land use or transportation in the KCDD other than those already programmed as part of existing City or HCDA plan or proposed by other agencies. The Future Baseline Condition does not include direct coordination with the ~~HART~~ ***light metro rail*** alignment or mitigations that will capture the value of this public investment. The Future Baseline Condition does not include Complete Streets planning policies.

Proposed Action: As discussed in Chapter Two, the Proposed Action consists of two alternatives: TOD Alternative A and TOD Alternative B. However, for the purposes of the following traffic impact analysis, TOD Alternative A has been used to compare traffic impacts with the Future Baseline Condition because it represents the "worst-case" scenario, as summarized in Table 3-4 in the previous Chapter. TOD Alternative B is essentially a modification of TOD Alternative A; it provides a similar development pattern as envisioned in TOD Alternative A but with a height limit of 418 feet that precludes the construction of "iconic" towers, resulting in a decrease in population as well as overall density. Because traffic impacts are derived from population plus the square footage of new non-residential development, utilizing the TOD alternative with the greatest potential impacts, that is to say, the highest population and the greatest amount of non-residential development represented in square feet, constitutes a reasonable basis for analysis. For the remainder of the traffic discussion and analysis, the term "Proposed Action" implies the worst-case scenario (TOD Alternative A) but is equally applicable to TOD Alternative B.

The primary purpose of the Proposed Action is to coordinate future urban redevelopment with the provision of ~~HART rapid transit~~ ***light metro rail*** so that residents, employees and visitors can take advantage of improved mobility choices. Land use policies in the Plan focus intensive mixed-use redevelopment into identified areas near to proposed ~~HART~~ ***light metro rail*** ~~transit~~ stations.

The Proposed Action also provides a comprehensive set of policies that aim to create a network of safe and comfortable streets with convenient access to ~~HART~~ ***light metro rail*** stations. Both TOD Alternatives A and B provide tools to introduce integrated transportation management, requirements for improved street connectivity, trip reduction (transportation demand management) measures, transit enhancements (feeder service, connectors and local bus enhancements), pedestrian and bike improvements, shared parking, and parking pricing. Neither TOD Alternative A or B proposes new development in the Makai District related to the proposed transit stations; however, either alternative envisions the integration of the Complete Streets concept throughout the Mauka and Makai Districts.

The Proposed Action responds to the development of the ~~HART~~ elevated ***light metro*** rail system and the designation of three transit station locations within the KCDD. The coming introduction of rail transit - in parallel with community-driven interest in creating a city that is highly walkable, friendly and safe for cyclists – is an important reason for adopting the Proposed Action. However the rail system is only one outcome of a much broader movement to bring vitality to urban Honolulu, reflecting the values of the native Hawai`ian culture, particularly stewardship of the land and environment, preservation of the native culture, openness to the visiting world, and responsibility to local people and their prosperity.

The analysis of TOD Alternative A tests the policy measures included in the Proposed Action. This analysis includes a likely "best guess" scenario for the maximum development envelope, given location and general economic factors. It explores the potential for proposed high-rise building types and more intensive density allocations. A primary consideration of the Proposed Action is how land use change might both respond to and support the ~~HART rapid transit~~ ***light metro rail*** system as well as supplementary improvements for walking and cycling to create a pedestrian and transit friendly environment.

4.7.2 Significance Criteria

For purposes of the EIS, transportation impacts are considered significant if the Proposed Action results in unacceptable conditions based on local significance criteria. This analysis applies the multi-modal significance criteria that were identified in the *2009 Kaka`ako Mauka Area Plan Supplemental EIS* (2009 SEIS). The criteria are as follows:

Motor Vehicle Traffic Impact Criteria

- *The operational impacts on intersections are considered significant if plan-related traffic causes the level of service to deteriorate from LOS E or better under the Future Baseline Condition to LOS F under the Proposed Action.*
- *The operational impacts on signalized intersections operating at LOS F under both the Future Baseline Condition and Proposed Action are considered significant if the volume-to-capacity (v/c) ratio under the Proposed Action exceeds that of the Future Baseline Condition.*

Transit Impact Criteria

- *The operational impacts on transit facilities are considered significant if the plan causes a substantial increase in transit demand that could not easily be accommodated by available transit capacity, resulting in unacceptable levels of transit service. A capacity utilization above 80 to 90 percent is generally considered unacceptable for urban transit services.*
- *The operational impacts on transit facilities are considered significant if the plan causes a substantial increase in operational delay or costs that could result in adverse impacts to transit service.*

Bicycle Impact Criteria

- *The operational impacts on bicycle facilities are considered significant if the plan would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.*

Pedestrian Impact Criteria

- *The operational impacts on pedestrian facilities are considered significant if the plan would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.*

4.7.3 Affected Environment (Existing Conditions)

Following is a description of the existing traffic-related conditions in the KCDD.

4.7.3.1 Street Network in the KCDD

The KCDD is bisected by two major Ewa-Diamond Head (east-west) connections: Ala Moana Boulevard, and Kapiolani Boulevard. Queen Street, although not a regional connector, is considered to be a secondary collector street:

- **Ala Moana Boulevard** (State Route 92) is a 6-lane east-west arterial street through the southern portion of the KCCD that connects to the west with Nimitz Highway to the west, and connects Downtown Honolulu, Kaka`ako, Ala Moana Center and areas to the east near Waikiki. Pedestrian crossing distances are over 70 feet at most locations. No bicycle lanes are provided.
- **Kapiolani Boulevard** is a 6-lane east-west arterial street through the northern portion of the KCCD that connects areas to the east near Waikiki with Kaka`ako, and Downtown Honolulu via King Street. Pedestrian crossing distances are approximately 64 feet at most locations. No bicycle lanes are provided.
- **Queen Street** is a 2-lane collector street between Kamakee and Cooke Streets, widening to 4 lanes west of Cooke Street to downtown. Pedestrian crossing

distances are generally 44 feet or less. Sidewalks are missing on some segments. No bicycle lanes are provided.

The major Mauka - Makai (north-south) connections providing access to the KCDD are: Ward Avenue, Piikoi Street, and Punchbowl Street. Secondary connections are South Street, Cooke Street, and Kamakee Street.

- **South Street** and **Punchbowl Street** are north-south collector streets at the western edge of the study area that connect Ala Moana Boulevard and King Street. Crossing distances vary, generally between 54 to 64 feet. No bicycle lanes are provided.
- **Cooke Street** is a 4-lane street that extends from south of Ala Moana Boulevard to King Street. Crossing distances are approximately 44 feet at most locations. No bicycle lanes are provided.
- **Ward Avenue** is a 4-lane north-south collector that extends from the south of Ala Moana Boulevard to the north of King Street. Crossing distances are approximately 64 feet at most locations. No bicycle lanes are provided.
- **Kamakee Street** is a 4-lane north-south street that connects Ala Moana Boulevard and Kapiolani Boulevard, to the east of Ward Avenue. Crossing distances vary between approximately 44 to 58 feet. No bicycle lanes are provided.
- **Piikoi Street** is a north-south arterial street at the eastern edge of the study area that connects with Ala Moana Boulevard to the east of the KCCD, adjacent to the Ala Moana Center. North of Kapiolani Street: Piikoi serves one-way northbound motor vehicle traffic, while southbound traffic travels one block west on Pensacola Street. Crossing distances vary, generally between 60 to 64 feet. No bicycle lanes are provided.

A map of the roadway network serving the KCDD is depicted in Figure 4-8. Estimated daily traffic volumes on key corridors are presented in Figure 4-9. It should be noted that in August 2014, the City and County of Honolulu announced that it intends to convert the section of Waimanu Street between Piikoi and the Queen Street extension to two-way traffic.

Figure 4-8: Existing Street Network

Figure 4-9: Traffic Corridors with KCDD

A description of right-of-way widths within the study area is provided in Table 4-4.

Table 4-4: Street Types and Roadway Widths

Street Name	Road Type	Right-of-Way Width (feet)
King	Avenue	90’
Kapiolani	Boulevard	100’
Queen	Street	Varies, 50’-60’
Queen Extension/ Waimanu	Street	100’
Halekauwila	Street	60’
Pohukaina	Promenade Street	60’
Auahi (Ward to Queen Lane)	Promenade Street	60’
Auahi (Ahui Ext. to South)	Promenade Street	60’
Ala Moana Boulevard	Promenade Boulevard	100’
Waimanu (Dreier to Kamakee)	Service Street	40’
Kawaiahao	Street	50’
Ilaniwai	Service Street	40’
Kona	Service Street	40’
Hopaka	Alley	19’
Punchbowl	Promenade Avenue	70’
South	Avenue	Varies, 66’-80’
Cooke	Promenade Street	60’
Ward Avenue	Promenade Avenue	80’
Kamakee	Promenade Street	76’
Piikoi	Avenue	80’
Pensacola	Avenue	76’
Keawe	Street	50’
Coral	Service Street	40’
Emily	Service Street	40’
Curtis	Service Street	40’
Dreier	Service Street	40’
Koula (Ala Moana to Halekauwila)	Service Street	40’
Ahui & Ahui, Extension to Ala Moana	Street	50’
Cummins Extension (Queen to Ala Moana)	Street	50’

Cross-section drawings showing existing lane allocations and travel-way widths are presented for each of the primary streets serving the KCDD in Figure 4-10.

Figure 4-10: Cross-Sections of Existing Streets

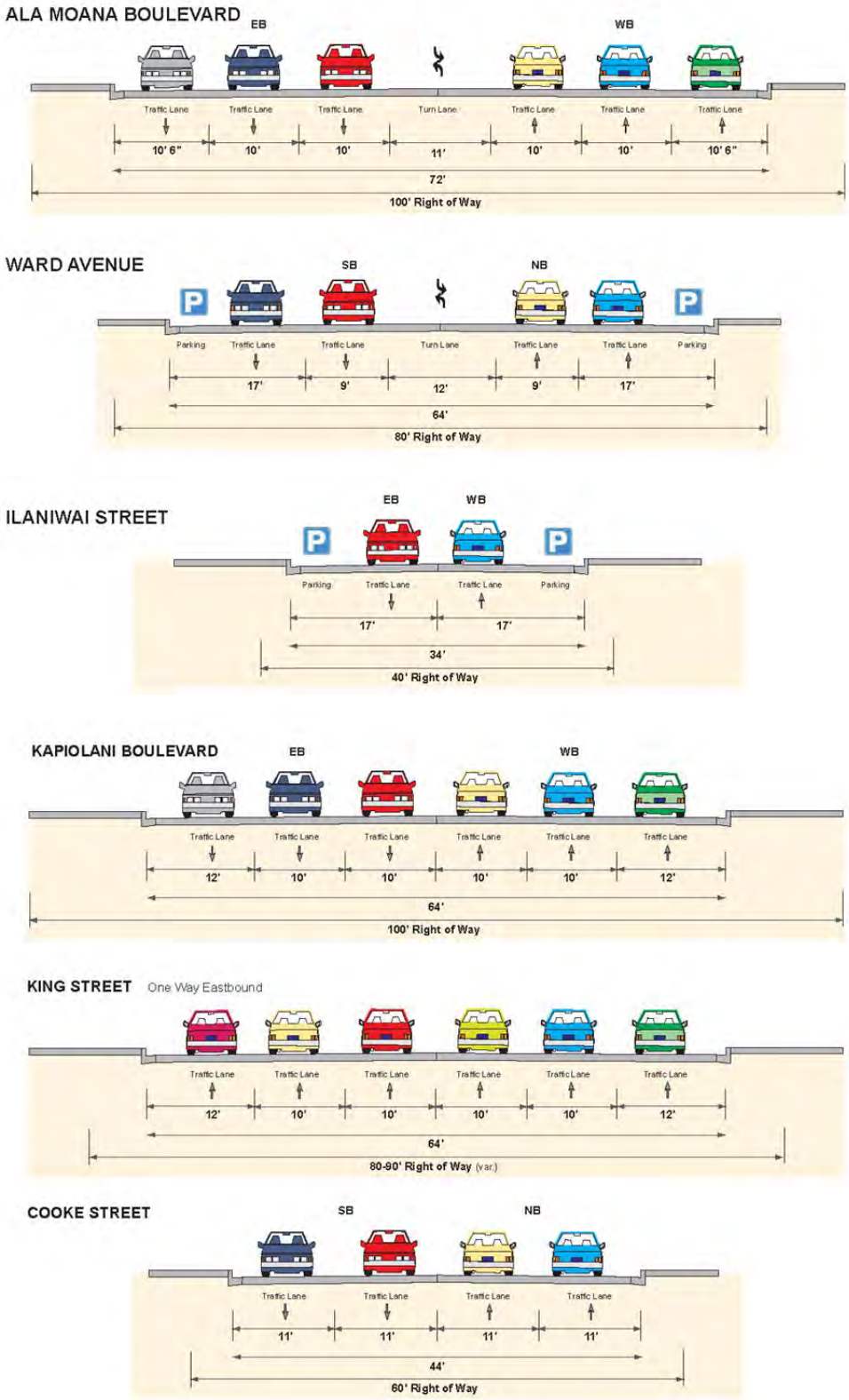


Figure 4-10 (continued)

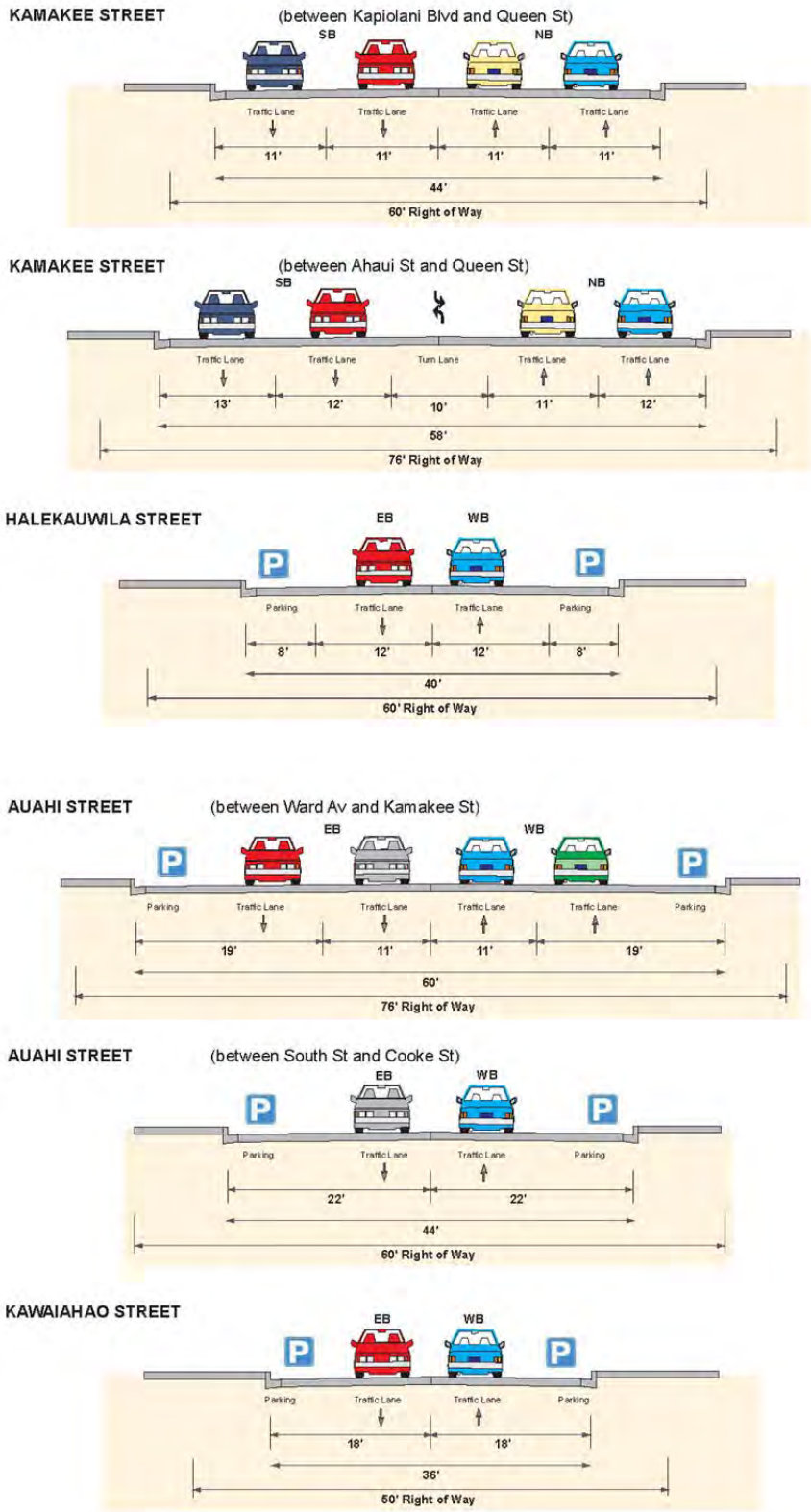
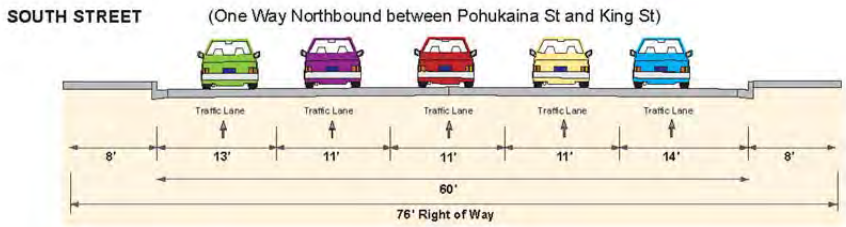
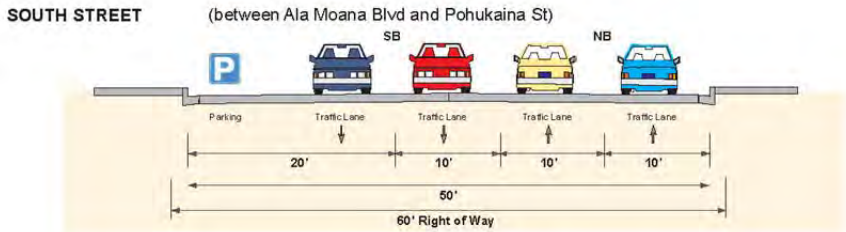
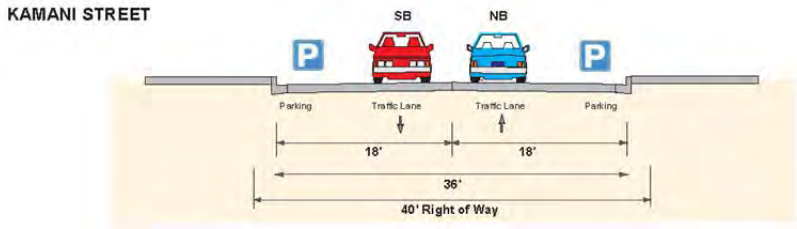


Figure 4-10 (continued)







On-street parking restrictions by street frontage are presented in Figure 4-11.

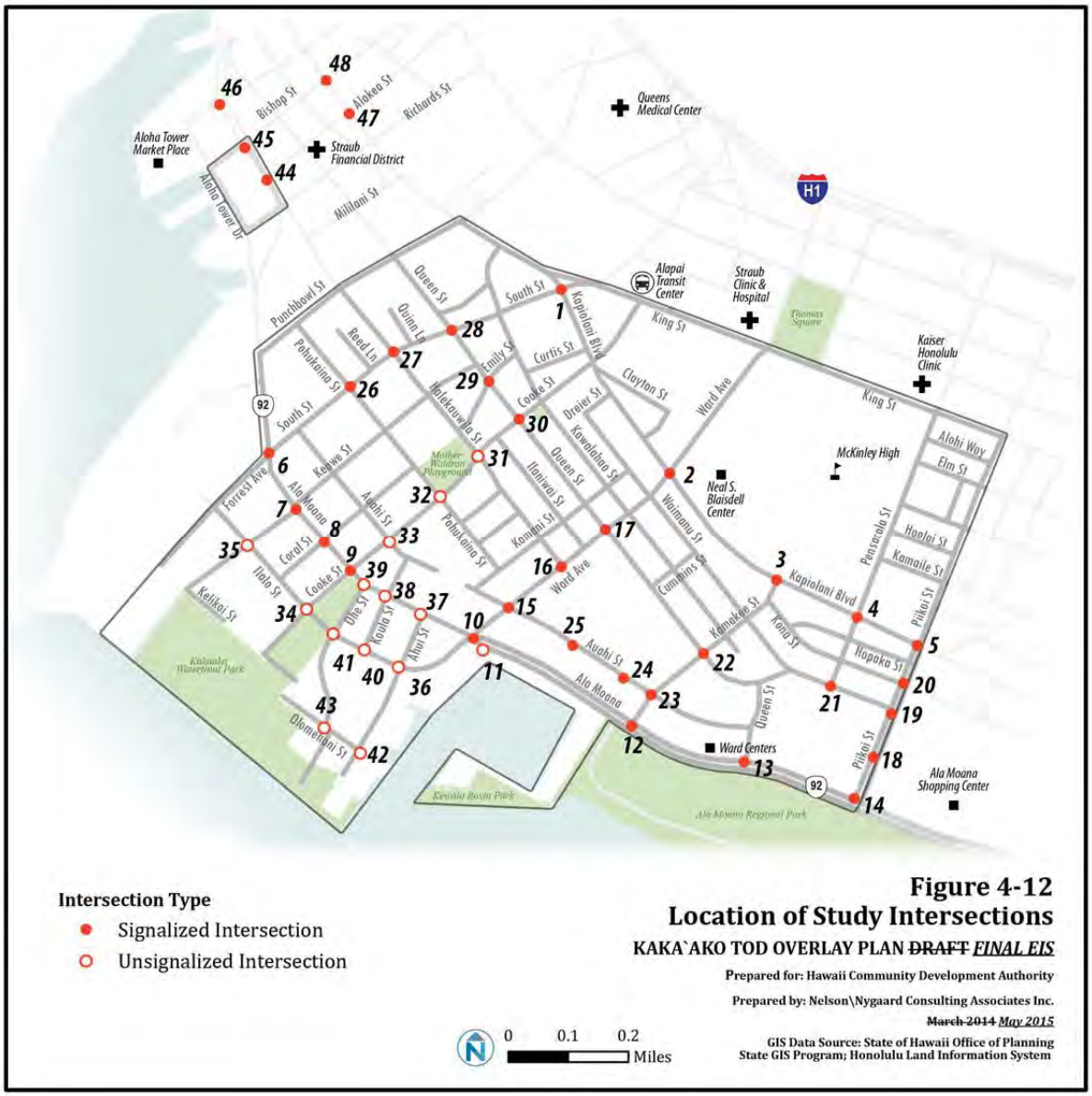
Figure 4-11: Motor Vehicle Parking Restrictions

Based on the criteria discussed above, the significance of impacts resulting from the Proposed Action is based on the effect that implementation will have on key intersections. The majority of study intersections are located on the key east/west and north/south transportation corridors that provide access to KCDD, downtown, and Ala Moana Center. Figure 4-12 shows the location of the 48 intersections that HCDA selected for the analysis:

1. Kapiolani Boulevard/South Street/King Street
2. Kapiolani Boulevard/Ward Avenue

3. Kapiolani Boulevard/Kamakee Street
4. Kapiolani Boulevard/Pensacola Street
5. Kapiolani Boulevard/Piikoi Street
6. Ala Moana Boulevard/South Street
7. Ala Moana Boulevard/Keawe Street
8. Ala Moana Boulevard/Coral Street
9. Ala Moana Boulevard/Cooke Street
10. Ala Moana Boulevard/Ward Avenue
11. Ala Moana Boulevard/Kewalo Basin
12. Ala Moana Boulevard/Kamakee Street
13. Ala Moana Boulevard/Queen Street
14. Ala Moana Boulevard/Piikoi Street
15. Ward Avenue/Auahi Street
16. Ward Avenue/Halekauwila Street
17. Ward Avenue/Queen Street
18. Piikoi Street/Ala Moana Shopping Center/Hawaiki Tower
19. Piikoi Street/Waimanu Street
20. Piikoi Street/Kona Street
21. Pensacola Street/Waimanu Street
22. Kamakee Street/Queen Street
23. Kamakee Street/Auahi Street
24. Auahi Street/Pedestrian Crossing (Ward Entertainment Center)
25. Auahi Street/Pedestrian Crossing (Ward Warehouse/Farmers Market)
26. South Street/Pohukaina Street
27. South Street/Halekauwila Street
28. South Street/Queen Street
29. Queen Street/Emily Street
30. Queen Street/Cooke Street
31. Halekauwila Street/Cooke Street
32. Pohukaina Street/Cooke Street
33. Auahi Street/Cooke Street
34. Ilalo Street/Cooke Street
35. Ilalo Street/Keawe Street
36. Ilalo Street/Ahui Street
37. Ala Moana Boulevard/Ahui Street
38. Ala Moana Boulevard/Koula Street
39. Ala Moana Boulevard/Ohe Street
40. Ilalo Street/Koula Street
41. Ilalo Street/Ohe Street
42. Ahui Street/Olomehani Street
43. Ohe Street/Olomehani Street
44. Ala Moana Boulevard/Alakea Street
45. Ala Moana Boulevard/Bishop Street
46. Ala Moana Boulevard/Fort Street
47. King Street/Alakea Street
48. King Street / Bishop Street

Figure 4-12: Location of Study Intersections



4.7.3.2 Trip Generation and Travel Modes

The regional trip generation model utilized by the Oahu Metropolitan Planning Organization (OMPO) accounts for a range of factors affecting transportation demand including land uses, number of households, and employment. Based on the regional distribution of land uses and transportation facilities, the model estimates the number of trips between origins (e.g. residences) and destinations (e.g. retail, employment). The model further estimates the portion of trips that occur via motor vehicle, transit, bicycling and walking.

Volume of daily trips (by all modes) is estimated by the OMPO model based on the existing mix of land uses within the TAZs that include the KCDD.

- The TAZs in the KCDD are currently developed with an estimated 11,887 residential units
- Non-residential uses within the TAZs provide an estimated 36,219 jobs (7,916 retail jobs and 28,303 non-retail jobs).

Based on the existing mix of land uses, the OMPO model estimates that 286,000 daily trips are made to, from, and within the study area:

- **Approximately 77 percent of daily trips are made via automobile** – including carpool trips. Based on estimated vehicle occupancy, the OMPO model estimates that existing land uses generate 184,797 daily vehicle trips. Since traffic studies frequently focus on traffic operations during the "peak hours" that coincide with morning and afternoon work-commute periods, the OMPO model also provides an estimate of peak-hour motor vehicle trip generation. It forecasts 13,822 vehicle trips generated during the AM Peak Hour and 9,249 vehicle trips generated during the PM Peak Hour.
- **Approximately seven percent of daily trips are made by transit** – an estimated 20,655 daily transit riders. The OMPO model does not provide an estimate of peak-hour transit ridership (instead, the peak-period transit ridership forecast is based on multi-hour morning and afternoon peaks).
- **Approximately 16 percent of daily trips are pedestrian or bicycle trips** – an estimated 44,466 daily pedestrian or bicycle trips.
- **Approximately 37 percent of daily trips are internal to the study area.** The portion of "internal trips" is a function of the mix of land uses.

Table 4-5 summarizes the estimate of existing daily trip generation derived from the OMPO Model.

Table 4-5: Trip Generation by Existing Land Uses (OMPO Model Estimate)

	Vehicle Trips			Transit Trips	Walk/Bike Trips
	AM Peak Hour	PM Peak Hour	Daily	Daily	Daily
Existing Conditions (2015 Base Year)	13,822	9,249	**184,797**	**20,655**	**44,466**

An addition source of information is derived from Census-based data. Table 4-6 summarizes the mode of travel to work for existing Kaka`ako residents over the age of 16, based on this Census data.

Table 4-6: Existing Travel Modes: Work Trips by Existing Residents

Workers 16 years and over	Census Commute Mode Share
Car, truck, or van	70.6%
Drove alone	58.1%
Carpooled	12.5%
In 2-person carpool	10.4%
In 3-person carpool	0.0%
In 4-or-more person carpool	2.0%
Public transportation (excluding taxicab)	3.8%
Walked	16.2%
Bicycle	3.6%
Taxicab, motorcycle, or other means	2.4%
Worked at home	3.4%

Table 4-7 provides a comparison of travel mode shares for total daily trips, based on the OMPO model, and work trips for Kaka`ako area residents, based on the US Census data summarized above.

- Rates of walking and bicycling to work are high for work trips by Kaka`ako residents – nearly 20 percent walk or bicycle to work – reflecting the proximity of Kaka`ako residences with nearby jobs, within KCDD and in adjacent employment and commercial areas including downtown and the Ala Moana Center.
- The overall rate of walking and bicycling to and from Kaka`ako (Total Daily Trips based on the OMPO model), which includes non-work trips by residents and non-residents, is estimated at under 15.5 percent.
- The rate of transit use is over 7 percent for all trips to and from Kaka`ako, compared to less than 4 percent for Kaka`ako residents. This difference reflects residents' greater propensity for walking and bicycling to nearby jobs as noted above.
- Note that the data comparison shown on the above table is not strictly an "apples to apples" comparison, since the percentage of workers that "work at home" is also included in the U.S. Census data.

Table 4-7: Existing Travel Mode Comparison

	Total Daily Trips to/from Kaka'ako (Base Year 2015 OMPO Model)	Work Trips Only – Kaka`ako Residents (US Census Journey-to-Work Data)
Motor Vehicle (including motorcycle & taxi)	**77.3%**	**73.0%**
Walk + Bicycle	**15.5%**	**19.8%**
Public Transit	**7.2%**	**3.8%**
Work at Home	**N/A**	**3.4%**

4.7.3.3 Existing Vehicular Traffic Volumes and Operations

Peak-period intersection volume counts were conducted during the week of January 15, 2013 at each study intersection:

- Travel counts included motor vehicle movements and pedestrian crossings at each study intersection. Count sheets from each location are provided in Appendix A of the Traffic Study (Appendix D) of this EIS.
- Morning counts were conducted from 7:00 AM to 9:00 AM. Afternoon counts were conducted from 4:00 to 6:00 PM. Using on those 2-hour counts, the "peak hour" was determined at each study intersection based on the highest consecutive 60-minute volume.

Peak-hour motor vehicle volumes at each study intersection are shown on Figures 11 to 13 of the Traffic Study (Appendix D).

Traffic operations are typically evaluated based on Level of Service (LOS) standards described in the U.S. Department of Transportation's 2010 Highway Capacity Manual (HCM). LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, which represents free flowing operating conditions, to LOS F, which represents the most congested conditions. LOS E represents "at-capacity" operations. When traffic volumes exceed the capacity, stop-and-go conditions result, and operations are designated as LOS F. Table 4-8 summarizes the LOS definitions for each rating (A though F) for both signalized and stop-sign controlled intersections.

Table 4-9 summarizes Existing AM & PM Peak Hour LOS at each study intersection, based on the Existing Conditions analysis steps described above.

Table 4-8: Intersection Level of Service (LOS) Definitions

LOS	Flow Type	Operational Characteristics	Intersection Control Delay (seconds/vehicle)	
			Signal Control	2-Way-Stop or All-Way Stop Control
A	Stable Flow	Free-flow conditions with negligible to minimal delays. Excellent progression with most vehicles arriving during the green phase and not having to stop at all. Nearly all drivers find freedom of operation.	< 10	0 – 10
B	Stable Flow	Good progression with slight delays. Short cycle-lengths typical. Relatively more vehicles stop than under LOS A. Vehicle platoons are formed. Drivers begin to feel somewhat restricted within groups of vehicles.	> 10 – 20	> 10 – 15
C	Stable Flow	Relatively higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant, although many still pass through without stopping. Most drivers feel somewhat restricted.	> 20 – 35	> 15 – 25
D	Approaching Unstable Flow	Somewhat congested conditions. Longer but tolerable delays may result from unfavorable progression, long cycle lengths, and/or high volume-to-capacity ratios. Many vehicles are stopped. Individual cycle failures may be noticeable. Drivers feel restricted during short periods due to temporary back-ups.	> 35 – 55	> 25 – 35
E	Unstable Flow	Congested conditions. Significant delays result from poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures occur frequently. There are typically long queues of vehicles waiting upstream of the intersection. Driver maneuverability is very restricted.	> 55 – 80	> 35 – 50
F	Forced Flow	Jammed or gridlock type operating conditions. Generally considered to be unacceptable for most drivers. Zero or very poor progression, with over-saturation or high volume-to-capacity ratios. Several individual cycle failures occur. Queue spillovers from other locations restrict or prevent movement.	> 80	> 50

Table 4-9: Peak Hour Level of Service at Study Intersections (Existing)

Intersection Number	Street Names	Control Type	AM LOS (Delay)	PM LOS (Delay)
1a	South at Kapiolani	Signalized	B (19)	C (24)
1b	King at Alapai	Signalized	C (24)	C (21)
2	Ward at Kapiolani	Signalized	D (46)	D (39)
3	Kamakee at Kapiolani	Signalized	A (<10)	C (24)
4	Pensacola at Kapiolani	Signalized	B (19)	C (20)
5	Piikoi at Kapiolani	Signalized	B (18)	C (26)
6	South/Forest at Ala Moana	Signalized	E (58)	E (71)
7	Keawe at Ala Moana	Signalized	*D (<55)	*C (<35)
8	Coral at Ala Moana	Signalized	*C (<35)	*C (<35)
9	Cooke at Ala Moana	Signalized	D (41)	*D (<55)
10	Ward at Ala Moana	Signalized	E (59)	E (57)
11	Kewalo Basin at Ala Moana	TWSC	B (11)	A (<10)
12	Kamakee at Ala Moana	Signalized	A (<10)	B (13)
13	Queen at Ala Moana	Signalized	B (15)	B (14)
14	Piikoi at Ala Moana	Signalized	C (26)	C (23)
15	Ward at Auahi	Signalized	B (12)	B (13)
16	Ward at Halakauwila	Signalized	A (<10)	B (15)
17	Ward at Queen	Signalized	B (19)	C (31)
18	Piikoi at Shopping Center	Signalized	A (<10)	B (15)
19	Piikoi at Waimanu	Signalized	B (17)	B (18)
20	Piikoi at Kona	Signalized	A (<10)	B (12)
21	Pensacola at Waimanu	Signalized	D (43)	C (34)
22	Queen at Kamakee	Signalized	C (30)	C (34)
23	Kamakee at Auahi	Signalized	B (17)	C (31)
24	Ward Entertainment Center driveway at Auahi	Signalized	A (<10)	A (<10)
25	Ward Warehouse driveway at Auahi	Signalized	A (<10)	A (<10)
26	South at Pohukaina	Signalized	B (19)	C (20)
27	South at Halakauwila	Signalized	B (16)	C (21)
28	Queen at South	Signalized	B (16)	B (20)
29	Coral/Emily at Queen	Signalized	B (11)	A (<10)
30	Cooke at Queen	Signalized	B (19)	C (22)
31	Cooke at Halakauwila	AWSC**	B (11)	B (16)
32	Cooke at Pohukaina	AWSC	A (<10)	C (14)
33	Auahi at Cooke	TWSC***	B (11)	B (13)
34	Cooke at Ilalo	TWSC	B (11)	A (<10)
35	Keawe at Ilalo	TWSC	A (<10)	B (14)
36	Ahui at Ilalo/Ward	AWSC	A (<10)	A (<10)
37	Ahui at Ala Moana	TWSC	A (<10)	A (<10)
38	Koula at Ala Moana	Signalized	*C (<35)	*D (<55)
39	Ohe at Ala Moana	TWSC	B (15)	C (17)
40	Ilaho at Koula	TWSC	A (<10)	A (<10)
41	Ohe at Ilalo	TWSC	B (11)	B (11)
42	Ahui at Olomehani	TWSC	A (<10)	A (<10)

Intersection Number	Street Names	Control Type	AM LOS (Delay)	PM LOS (Delay)
43	Driveway/Ohe at Olomehani	TWSC	A (<10)	A (<10)
44	Ala Moana at Alakea	Signalized	B (16)	B (15)
45	Bishop at Ala Moana	Signalized	C (21)	C (33)
46	Fort at Ala Moana	Signalized	A (<10)	A (<10)
47	Alakea at King	Signalized	C (24)	B (19)
48	Bishop at King	Signalized	C (30)	***D*** (58)
* Reflects estimate of additional delay due to downstream capacity constraints.				
**All Way Stop Controlled				
***Two Way Stop Controlled				

As shown above:

- The following intersections operate at LOS E during the AM or PM Peak Hour, indicating congested conditions:
  - Ala Moana & South/Forest
  - Ala Moana & Ward
  - Bishop & King
- During the peak periods, the peak-direction traffic flow in the "peak direction" (westbound AM, eastbound PM) results in queues that affect downstream intersections. Lengthy signal cycle lengths on the major east/west arterial corridors contribute added delay to motorists, pedestrians and cyclists, during peak as well as off-peak hours. The east/west cycles vary from 100 to 140 seconds. Such cycles are much longer in duration than found in most central-city or downtown areas, and may conflict with goals aiming at creating a walkable, multi-modal environment

A key distinction when determining LOS pertains to the assessment of side street stop-signed controlled intersections:

- At signalized intersections, and at "all-way stop-sign controlled intersections", the methodology for calculating LOS is based on average motor vehicle delay for all approaches.

The LOS methodology differs slightly for side-street stop sign controlled intersections. For these intersections, LOS is based on average delay to the side-street (approaching the stop-sign). This study includes several side-street stop-sign controlled intersections, including the stop-sign controlled to Ala Moana Boulevard at Ahui Street and Kaula Street.

4.7.3.4 Existing Transit Service

The City and County of Honolulu is served by The Bus, one of the most highly used public bus systems of any city in the nation on a per capita basis. TheBus is operated by Oahu

Transit Services (OTS) and provides fixed-route public transit and paratransit service in the KCDD Mauka Area, Honolulu, and throughout the island of O`ahu. TheBus operates a "hub-and-spoke" network, with the majority of services centralized along major corridors and serving major destinations. Within the Mauka Area, most lines run along major corridors such as King Street, Kapiolani Boulevard, and Ala Moana Boulevard.

Major trunk lines such as the 1/1L and 2/13 provide high-frequency service all day, with the remainder operating at lower and sometimes irregular frequencies. Feeder lines connect various neighborhoods within Honolulu to major destinations or transfer points. Peak express buses run a limited number of runs in the peak period in the peak direction, connecting various parts of O`ahu with Downtown Honolulu and the Mauka Area. TheBus also operates four rapid bus lines through the Mauka Area: CityExpress A, CityExpress B, CountryExpress C, and CountryExpress E. TheBus service was formerly complemented by ferry service operated as TheBoat, which ran between the Aloha Tower in Downtown and Kalaeloa on the west side of Oahu. However, the ferry service has been discontinued. Existing transit service in the Mauka Area in the AM and PM peak periods is mapped in Figure 14 of the Study presented in Appendix D.

An analysis of existing transit ridership and system capacity was conducted and produced the results presented in Table 4-10.

Table 4-10: Existing Transit Capacity Utilization

Screenline	Existing Conditions		
	Ridership	**Capacity**	**Capacity Utilization**
AM Beak Hour - Inbound			
East	4,635	10,500	44%
West	2,943	6,720	44%
North	351	480	73%
Total	**7,929**	**17,700**	**45%**
PM Peak Hour - Outbound			
East	2,915	6,300	46%
West	4,645	10,590	44%
North	440	660	67%
Total	**8,000**	**17,550**	**46%**

4.7.3.5 Existing Bicycle Circulation

Bicyclists traveling to and through the KCDD generally must share travel lanes with automobiles to access destinations because there are limited designated bicycle facilities. The Aloha Tower Special District is not served by existing bicycle facilities. The most direct routes for bicycle travel—including King Street, Kapiolani Boulevard, and Ala Moana Boulevard—are not popular or comfortable cycling routes due to heavy vehicle volumes, high off-peak travel speeds, and the absence of dedicated bicycle facilities. There are only three short bikeway segments within the project area. They include:

- **Kaka`ako Waterfront Park multi-use path:** A bicycle and pedestrian only path facility fully separated from the nearest parallel roadway (Ala Moana Boulevard). The path continues from Kaka'ako Waterfront Park in the Makai Area east through Kewalo Basin and Ala Moana Park. Travel to and from neighborhoods and destinations Diamond Head of the project area can be made by bicycle on this facility; however, a variety of gaps make this connection challenging and exposes cyclists to various conflicts with turning automobiles.
- **Keawe Street southbound bike lane:** This one-way dedicated striped and signed bicycle facility spans from Ilalo Street southbound to the Keawe Street end at Kaka`ako Waterfront Park. The bike lane is proximate, but does not connect with the Kaka`ako Waterfront Park multi-use path due to a chain link fence barrier. This is the only existing bike lane in the KCDD Mauka Area.
- **Queen Street/Waimanu Street bike route:** This unmarked partially signed bicycle route connects cyclists from Kamakee Street to Piikoi Street. This facility is overlaid on a 4-lane configuration (two lanes in each direction from Pensacola Street to Kamakee Street; four lanes in one direction from Pensacola Street to Piikoi Street). No pavement markings—like shared lane markings (also known as sharrows)—are provided for safe riding location or wayfinding. The only signage indicating the bicycle route designation is provided on the Waimanu Street segment from Pensacola Street to Piikoi Street. (It is unclear at this point in time how the City's proposed conversion of the Waimanu segment between Piikoi and the Queen Street extension will impact bicycle usage on this street.)

Other designated facilities in the vicinity of the KCDD that provide access to Kaka`ako include:

- Ala Moana Regional Park multi-use path connecting cyclists to Ala Moana Center and Waikiki.
- Young Street bike lane and bike route—a key east-west bicycle street connecting bicyclists between the Kaka`ako and McCully-Mo`ili`ili neighborhoods.
- Capital Historic District/Alapai Transit Center multi-use path linkage from Kealamakai Street to Richards Street connecting cyclists to the Alapai Transit Center, the Hawai`i Capital Historic District, and Downtown.
- Hotel Street bike route—a shared bus and bike only street from Richards Street to River Street at the edge of Downtown Honolulu.

In addition, several low-speed, low volume internal streets provide relatively comfortable and direct shared-roadway bicycle connections *within* the project area. This includes Ilalo Street, Keawe Street, Pohukaina Street, Waimanu Street, and Kawaiahao Street. Although these streets provide comfortable shared roadway operating environment for bicycles, nearly all of the connections are bookended by a major arterial crossing barrier, a street end (i.e., cul-de-sac), or off-set intersection that requires travel on a short high speed, high volume segment. It should be noted that only one viable north-south shared roadway connection is available (Cooke Street), which requires bicycles entering or exiting the district to use one of the higher speed and volume streets.

As part of the transportation analysis, bicycle counts were collected in the PM peak travel period. The most heavily travelled bicycle corridors during PM peak include Kapiolani Boulevard (up to 70 east-west crossings), Ala Moana Boulevard (up to 72 east-west crossings), Piikoi Street (up to north-south 84 crossings), Kamakee Avenue (up to 74 north-south crossings), and Ward Avenue (up to 35 north-south crossings). Because most bicyclists do not prefer bicycle travel along high traffic corridors and freeway access routes for automobiles, there are limited routing options for cyclists that seek direct travel and limited delay at unsignalized crossings.

Bicyclists observed during the bicycle count typically used the right-most travel lane adjacent to curbside parking (or adjacent to the curb where parking is not permitted), or rode on the sidewalks. A map of the existing bicycle network and a map of existing bicycle volumes at intersections are presented as Figures 17 and 18, respectively, in the Traffic Study presented in Appendix D.

4.7.3.6 Existing Pedestrian Circulation

Existing pedestrian conditions vary in quality and facility availability (sidewalks, crossings, amenities, etc.). Many streets in Central Kaka`ako, including Queen Street and Waimanu Street, exhibit curbless industrial character. These streets lack curbs and sidewalks, forcing pedestrians to walk in the street without the necessary design features to ensure pedestrian comfort and safety. Other streets, like those bounding the Ward Centers, are highly oriented towards pedestrians.

This variance is due, in part, to the diversity of land uses in the project area (particularly the industrial land use character in Central Kaka`ako) and the related level of pedestrian orientation along and across each street. Pedestrian orientation is based on a variety of factors, including, but not limited to, sidewalk coverage and width, pedestrian-supportive amenities (e.g., shade tree canopy, benches, landscaping, etc.), walk distances, availability of marked crossings and short crossing distances, pedestrian delay acceptable for urban conditions, and traffic conditions (distance from adjacent traffic, traffic speed and volumes, etc.). Only a few streets in Kaka`ako have the qualities typical of a highly pedestrian oriented environment. These pedestrian-friendly streets include portions of Ilalo Street, Kapiolani Boulevard, Ward Avenue (immediately makai of Ala Moana Boulevard), Auahi Street, Kamakee Street, and Piikoi Street.

In general, pedestrian facilities in Kaka`ako can be characterized as follows:

- **Street Frontages.** Activating street frontages with pedestrian-oriented land uses and inviting pedestrian and bicycle environments helps to encourage walking to work, retail, and other commercial destinations. These active environments can be found in small pockets of Auahi Street and Cooke Street. Without the appropriate zoning regulations to ensure active street environments, very large retail establishments (100,000 square feet or larger) like Ward Centers and Ala Moana Center are typically antithetical to this pedestrian orientation factor.

- **Sidewalk coverage and width.** For the purposes of the Traffic Study, existing sidewalk in the Mauka Area is defined as either obstructed (effective width less than 4' feet) or unobstructed (effective width greater than or equal to 4'). Sidewalk widths in the KCDD range between spacious (Kapiolani = 17') and very constrained (makai side of Ala Moana = 3-4'). Most commercial streets (e.g., Cooke, Ward, Pensacola) have 10-foot sidewalks to support pedestrian activity, while many residential serving streets offer 4-6' sidewalks. Most streets outside of Central Kaka`ako and the Makai area have sidewalks on both sides of the street. The industrial character of many internal streets requires that pedestrians share space with cars and parking storage. Some streets like Ala Moana Boulevard and King Street have obstructions like utilities, landscaping, and transit benches that may impact people using mobility devices, e.g. wheelchairs.

Some streets provide generous pedestrian amenities like shade trees, benches, landscaped buffers, and planters that enhance the pedestrian experience and attract pedestrians. Kapiolani Boulevard, Ilalo Street, and parts of Auahi Street, Waimanu Street and Piikoi Street are model examples of high amenity streets.

Block size, which defines intersection density, is an enormously important factor that influences the accessibility and walkability of an area. Smaller block sizes decrease walking distances and, coupled with good urban design, tend to increase walkability and improve the pedestrian experience. Limited mid-block crossing opportunities either require longer walking distances to destinations (depending on routing and trip origin), or could encourage risky walking behavior, such as jaywalking and ignoring traffic control devices. Providing throughways or internal accessways within a larger development site breaks up the massive scale of large blocks and improves circulation through and around the site. This feature is only available in a few locations.

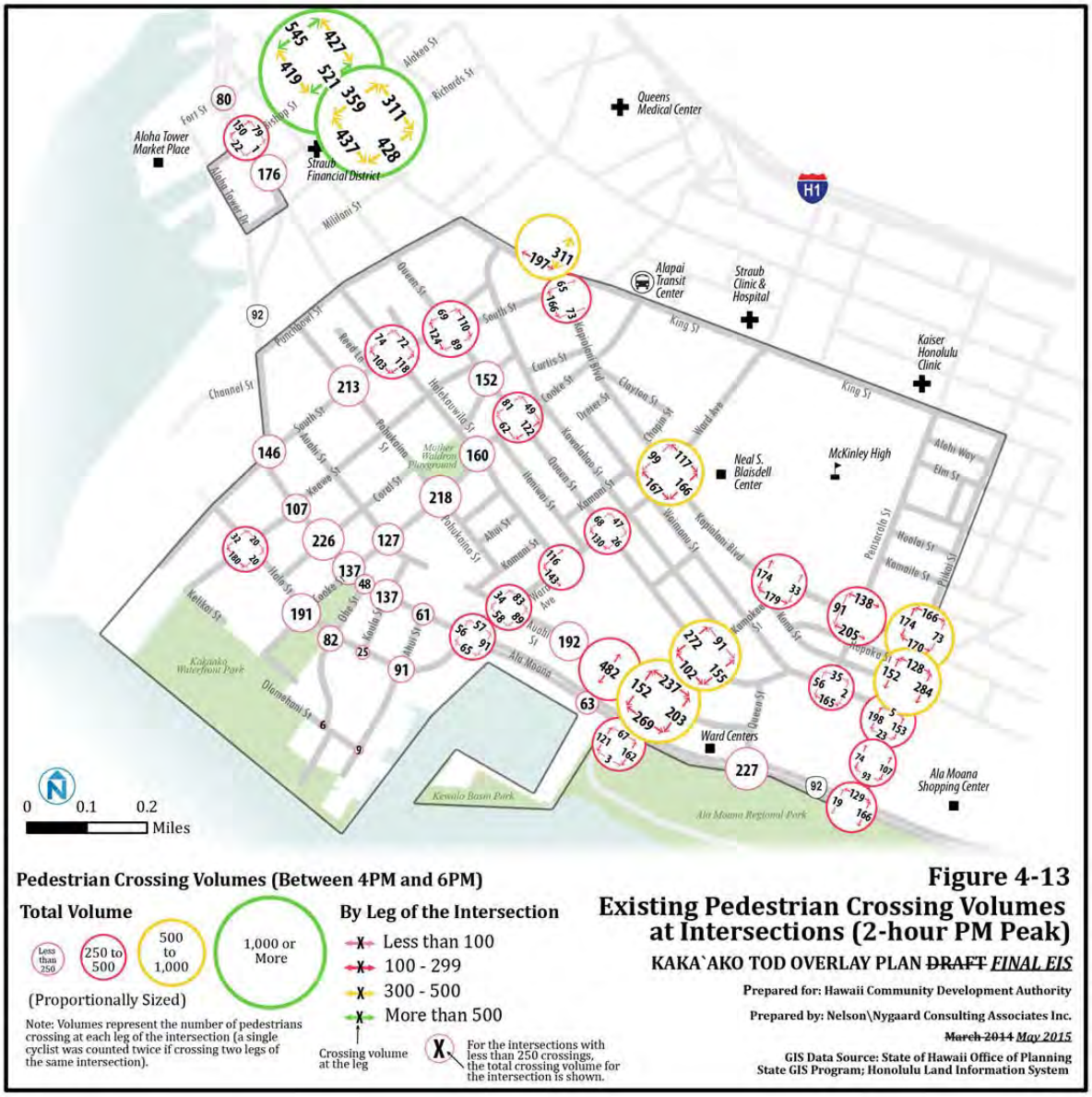
There are limited marked crossings throughout the KCDD. Most marked crossings are striped at signalized intersections, most of which are marked on all four legs. There are a variety of crossing conditions that create long crossing distances for pedestrians including wide arterial curb-to-curb widths (4 lanes and over), skewed intersections (the King/Kapiolani and Ala Moana/Ward intersections), intersection legs closed to pedestrians, large curb radii at intersection corners, and a general lack of curb extensions. Many of these conditions are prevalent throughout the project area.

Pedestrians experience long delays while crossing some arterials. In highly urbanized areas, pedestrian delay ranging from 70 to 80-second cycles is generally viewed as acceptable. Pedestrians crossing (north-south) at Ala Moana Boulevard commonly experience 140-second cycles, while street pushes through AM and PM peak auto volumes.

Figure 4-13 displays PM peak period pedestrian crossings throughout the project area. Pedestrian traffic is low in much of the project area, particularly compared to Downtown or Waikiki; many more people travel on foot on the western edge of the district adjacent to downtown and the government office areas. The highest level of pedestrian activity

occurs near major transit stops on Ward Avenue and Kapiolani Boulevard and in areas where there are higher concentrations of retail and services. Bishop Street, Richards Street, Kamakee Street, Piikoi Street, Ward Avenue, and Kapiolani Boulevard are corridors that produce the highest number of PM peak period crossings in the project area.

Figure 4-13: Existing Pedestrian Crossing Volumes at Intersections (2-hour PM Peak)



4.7.4 Comparing the Future Baseline Condition (Future Without The Proposed Action) with the Existing Conditions

4.7.4.1 Travel Mode and Trip Generation

The OMPO model was utilized to provide a forecast of trip generation based on Future Baseline Condition (Year 2035 Baseline) land uses. The net change to trip generation was derived based on existing land uses under the OMPO Model Year 2015 Baseline scenario. Table 4-11 provides a summary of the travel demand forecast.

Table 4-11: Travel Mode Comparison (Year 2035 vs. Existing)

	Existing Conditions (Model Base Year)	Future Baseline Condition (Model Year 2035 Baseline)
Households	11,867	38,221
Retail Employment	7,916	16,840
Non-Retail Employment	28,303	44,739
Daily Trips (all modes)	286,878	569,295
Transit Mode Share	7.2%	8.7%
Walk + Bike Mode Share	15.5%	20.1%
Automobile Mode Share	77.3%	71.3%
Internal Capture (portion of daily trips with origins & destinations within the study area)	36.7%	51.3%

As shown:

- Total trips by all modes to, from, and within the study area will approximately double as a result of expected development under the Future Baseline Condition.
- Rates of walking and bicycling – as a portion of total trips – will increase from 15 to 20 percent, while rates of driving – as a portion of total trips – will decrease from 77 to 71 percent.

The portion of daily trips internal to the study area (Internal Capture) will increase from approximately one-third to over one-half of daily trips.

Table 4-12 provides a comparison of motor vehicle, transit and walk/bike trips generated by land uses within the Plan Area, based on the regional model, under Existing and Year 2035 Future Baseline Conditions. As shown:

- Motor vehicle trips will increase by approximately 80 percent over existing conditions – from approximately 185,000 daily under Existing Conditions to approximately 338,000 daily in Year 2035 under the Future Baseline Condition.
- Transit trips will more than double – from approximately 20,000 daily transit trips under Existing Conditions, to nearly 50,000 daily trips to/from the study area in Year 2035.

- Bicycle and walking trips will nearly triple – from approximately 44,000 under Existing Conditions to over 114,000 in Year 2035.

Table 4-12: Trip Generation Comparison (Year 2035 vs. Existing)

	Vehicle Trips			Transit Trips	Walk/Bike Trips
	AM Peak Hour	**PM Peak Hour**	**Daily**	**Daily**	**Daily**
Existing Conditions	13,822	9,249	184,797	20,655	44,466
Year 2035 Baseline (Future Baseline Condition)	25,380	28,313	338,256	49,528	114,428
Net Trip Generation (Future Baseline Condition***)***	***11,558***	***19,064***	***153,459***	***28,873***	***69,962***

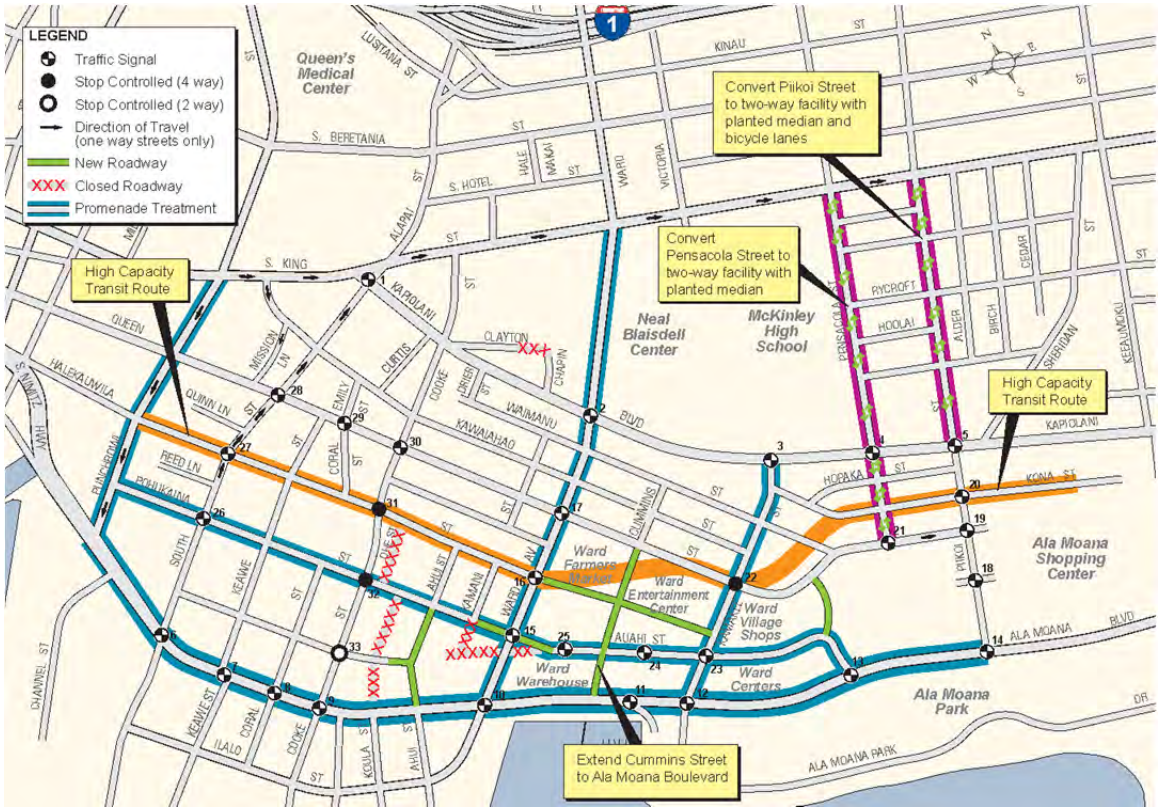
4.7.4.2 Future Baseline Roadway Network

Analysis of the Future Baseline Condition without the Proposed Action is based on an assumed future roadway network. This network includes some *but not all* of the roadway network changes that were analyzed as part of the 2009 SEIS (displayed in Figure 4-14). Changes to key roadways that are anticipated under the Future Baseline Condition without the Proposed Action include:

- Widening of Ala Moana Boulevard from 72 feet (under Existing Conditions) to 84 feet (under Year 2035 conditions), in order to provide additional left-turn capacity.
- Restriping of Ward Avenue to modify lane widths (but with no change to number of lanes or curb-to-curb width).

A proposal to implement a 2-way conversion of Piikoi and Pensacola is not included in the Future Baseline, based on the findings of the 2009 SEIS that identified a significant cumulative traffic impact resulting from the proposed conversion. As a result, the recommended mitigation, as described in the 2009 SEIS, was to maintain two-way operation on Piikoi and Pensacola.

Figure 4-14: Planned and Proposed Roadway Network Changes (Future Baseline Condition)



4.7.4.3 Year 2035 Traffic Operations Without The Proposed Action

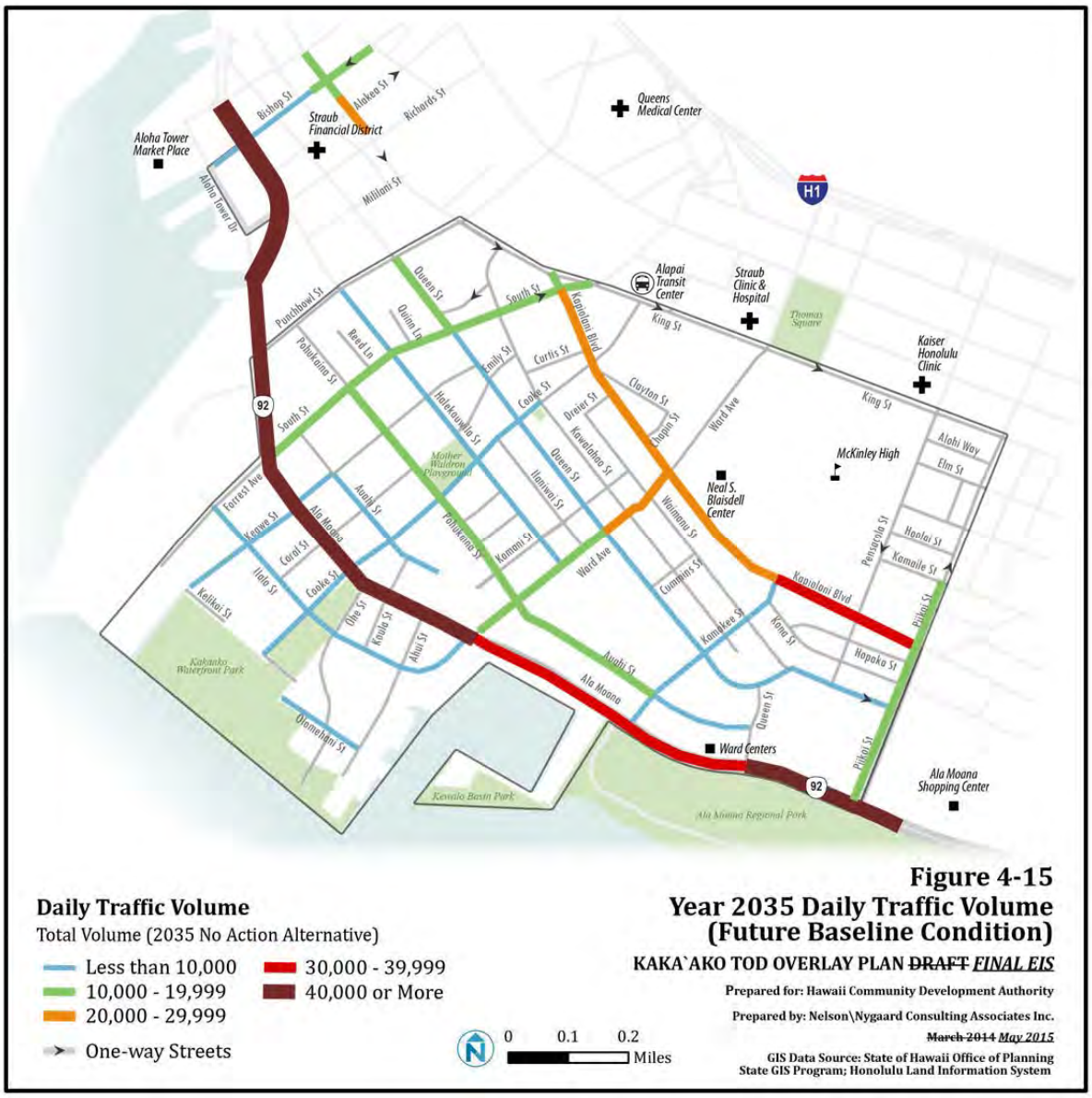
Year 2035 Baseline traffic volumes at each study intersection were estimated based on the anticipated net change in traffic volumes as determined by the OMPO model outputs. Forecast daily traffic volumes are summarized graphically in Figure 4-15. Forecast AM and PM Peak Hour volumes are presented in Figures 29 to 31 of the Traffic Study presented in Appendix D. A comparison of Existing PM peak hour traffic volumes and the forecast Future Baseline Condition PM peak hour traffic volumes yields the following findings:

- Traffic volumes at study intersections in the PM peak hour would be an average of 12 percent higher in the Future Baseline Condition alternative than under Existing Conditions.
- The largest increases in PM Peak Hour intersection volumes under the Future Baseline Condition would occur at the following five intersections, where the total 4-way approach volume is forecasted to increase by over 1,000 vehicles (representing an increase of over 30 percent at these locations):
  - Pensacola at Kapiolani
  - Ward at Kapiolani
  - Ward at Ahui

- Ward at Queen
- Cooke at Queen

- PM Peak Hour volumes at intersections on Ala Moana Boulevard are forecast to increase within a range varying from approximately 250 to 600 vehicles per intersection – representing an increase in volume at each intersection varying between approximately 7 to and approximately 14 percent as compared to Existing volumes.

Figure 4-15: Year 2035 Daily Traffic Volume (Future Baseline Condition)



4.7.4.4 Year 2035 Level of Service Without The Proposed Action

Based on the forecast peak-hour traffic volume under Year 2035 Baseline Conditions without the Proposed Action, the anticipated LOS was determined for each study intersection. Table 4-13 provides a comparison of Existing and Year 2035 Baseline (Future Baseline Condition) LOS at each study intersection during the AM and PM Peak Hours.

Table 4-13: Comparison of Peak Hour Intersection Level of Service (2035 vs. Existing Conditions)

			Existing		2035 Baseline (Future Baseline Condition)	
#	Street Names	Control Type	AM LOS (Delay)	PM LOS (Delay)	AM LOS (Delay)	PM LOS (Delay)
1a	South at Kapiolani	Signalized	B (19)	C (24)	C (21)	C (25)
1b	King at Alapai	Signalized	C (24)	C (21)	D (40)	C (22)
2	Ward at Kapiolani	Signalized	D (46)	D (39)	F (>80)	F (>80)
3	Kamakee at Kapiolani	Signalized	A (<10)	C (24)	A (<10)	D (44)
4	Pensacola at Kapiolani	Signalized	B (19)	C (20)	E (75)	E (78)
5	Piikoi at Kapiolani	Signalized	B (18)	C (26)	D (36)	C (24)
6	South/Forest at Ala Moana	Signalized	E (58)	E (71)	F (>80)	E (58)
7	Keawe at Ala Moana	Signalized	*D (<55)	*C (<35)	*E (<80)	*D (<55)
8	Coral at Ala Moana	Signalized	*C (<35)	*C (<35)	*D (<55)	*D (<55)
9	Cooke at Ala Moana	Signalized	D (41)	*D (<55)	F (>80)	*E (<80)
10	Ward at Ala Moana	Signalized	E (59)	E (57)	F (>80)	F (>80)
11	Kewalo Basin at Ala Moana	Not signalized	B (11)	A (<10)	A (<10)	A (<10)
12	Kamakee at Ala Moana	Signalized	A (<10)	B (13)	C (22)	B (12)
13	Queen at Ala Moana	Signalized	B (15)	B (14)	B (14)	B (18)
14	Piikoi at Ala Moana	Signalized	C (26)	C (23)	C (26)	B (19)
15	Ward at Auahi /Pokukaina	Signalized	B (12)	B (13)	B (17)	B (19)
16	Ward at Halakauwila	Signalized	A (<10)	B (15)	A (<10)	B (14)
17	Ward at Queen	Signalized	B (19)	C (31)	C (33)	F (>80)
18	Piikoi at Auahi	Signalized	A (<10)	B (15)	B (14)	B (14)
19	Piikoi at Waimanu	Signalized	B (17)	B (18)	C (25)	B (20)
20	Piikoi at Kona	Signalized	A (<10)	B (12)	B (12)	B (16)
21	Pensacola at Waimanu	Signalized	D (43)	C (34)	D (49)	D (51)
22	Queen at Kamakee	Signalized	C (30)	C (34)	C (21)	D (52)
23	Kamakee at Auahi	Signalized	B (17)	C (31)	C (23)	C (31)

			Existing		2035 Baseline (Future Baseline Condition)	
#	Street Names	Control Type	AM LOS (Delay)	PM LOS (Delay)	AM LOS (Delay)	PM LOS (Delay)
24	Ward Entertainment Center driveway at Auahi	Signalized	A (<10)	A (<10)	A (<10)	B (11)
25	Ward Warehouse driveway at Auahi	Signalized	A (<10)	A (<10)	A (<10)	A (<10)
26	South at Pohukaina	Signalized	B (19)	C (20)	B (19)	C (22)
27	South at Halakauwila	Signalized	B (16)	C (21)	B (23)	C (25)
28	Queen at South	Signalized	B (16)	B (20)	B (18)	C (22)
29	Coral/Emily at Queen	Signalized	B (11)	A (<10)	A (<10)	A (<10)
30	Cooke at Queen	Signalized	B (19)	C (22)	B (18)	E (78)
31	Cooke at Halakauwila	Planned signal**	B (11)	B (16)	B (19)**	B (16)**
32	Cooke at Pohukaina	Planned signal**	A (<10)	C (14)	B (14)**	B (13)**
33	Auahi at Cooke	TWSC	B (11)	B (13)	B (11)	B (13)
34	Cooke at Ilalo	TWSC	B (11)	A (<10)	A (<10)	A (<10)
35	Keawe at Ilalo	TWSC	A (<10)	B (14)	B (12)	B (14)
36	Ahui at Ilalo/Ward	AWSC	A (<10)	A (<10)	B (12)	C (15)
37	Ahui at Ala Moana	TWSC	A (<10)	A (<10)	A (<10)	A (<10)
38	Koula at Ala Moana	Signalized	*C (<35)	*D (<55)	*C (<35)	*E (<80)
39	Ohe at Ala Moana	TWSC	B (15)	C (17)	D (31)	C (17)
40	Ilaho at Koula	TWSC	A (<10)	A (<10)	B (11)	B (11)
41	Ohe at Ilalo	TWSC	B (11)	B (11)	B (13)	C (18)
42	Ahui at Olomehani	TWSC	A (<10)	A (<10)	A (<10)	A (<10)
43	Driveway/Ohe at Olomehani	TWSC	A (<10)	A (<10)	A (<10)	A (<10)
44	Ala Moana at Alakea	Signalized	B (16)	B (15)	B (14)	B (13)
45	Bishop at Ala Moana	Signalized	C (21)	C (33)	C (26)	E (57)
46	Fort at Ala Moana	Signalized	A (<10)	A (<10)	A (<10)	A (<10)
47	Alakea at King	Signalized	C (24)	B (19)	C (26)	D (50)
48	Bishop at King	Signalized	C (30)	E (58)	C (30)	E (71)

* Reflects estimate of additional delay due to downstream capacity constraints.
**Planned signalization described as mitigation in 2009 EIS.

4.7.4.5 Year 2035 Public Transit Without The Proposed Action

is building an elevated rapid transit line that will serve the City and County of Honolulu. The system will begin in East Kapolei and connect with the Honolulu International Airport and downtown Honolulu, ending at Ala Moana Center. Ridership is estimated at 116,300 weekday passenger trips by the year 2030, with trains arriving every three minutes during peak travel times, every six minutes during the day, and every ten minutes in the evenings.

The light rail system is scheduled to be in full operation by 2019 and is therefore included in the transit analysis because it will provide significant new transit capacity to the KCDD. The initial section of the rail transit system, from Kapolei to Aloha Stadium, is slated to open in 2017; the entire system, from Kapolei to Ala Moana Center, is scheduled to open in 2019.

The introduction of rapid transit to the KCDD will significantly change the dynamic for access to the district and mobility between the district and adjacent areas on the line. Much of the Mauka Area is within 5 to 10 minute walking distance (approximately .25 to .5 miles) of the three planned ~~HART rapid transit~~ ***light metro rail*** stations in the District, (see Appendix A: TOD Overlay Plan Figure 5-12). These stations will provide a previously unattainable level of connectivity and convenience in travel for those moving between KCDD and many other parts of the Honolulu metro area.

- **Civic Center Station:** Located on Halekauwila Street between South and Keawe Streets, this station site is adjacent to land that is part of Kamehameha School's *Kalaulu O Kaka`ako Master Plan* area.
- **Kaka`ako Station:** This station is planned by the City to be located on property that is part of the Ward Neighborhood Master Plan. The station site is positioned on the corner of Ward Avenue and Queen Street and will operate as the closest stop to Kewalo Basin boat harbor, the Ewa side of Ala Moana Beach Park, the Diamond Head side of Kaka`ako Waterfront Park and the Blaisdell Arena, Exhibition and Concert Halls.
- **Downtown Station (at the Aloha Tower Special District):** Located adjacent to the Aloha Tower Special District. The City intends this station to serve Honolulu's Central Business District.

Additionally, the KCDD has significant access to TheBus transit service, with major service corridors provided on King, Kapolani, and Ala Moana. Stops on Punchbowl, King, and Ala Moana are among the busiest transit boarding locations in Honolulu.
The expected transit network after implementation of the fixed guideway system is illustrated in Figure 4-16.

~~HART~~ ***Light metro rail*** is expected to substantially increase capacity in the west and east directions. ~~HART~~ ***It*** is also expected to draw new riders to transit because of planned improvements in speed, reliability, and frequency, thus causing an increase in ridership.

Table 4-14: Transit Capacity Utilization (2035 vs. Existing Condition)

Screenline	Existing Conditions			Future Baseline Condition		
	Ridership	Capacity	Capacity Utilization	Ridership	Capacity	Capacity Utilization
AM Beak Hour - Inbound						
East	2,943	6,720	44%	5,713	13,850	41%
West	4,635	10,500	44%	9,677	15,680	62%
North	351	480	73%	1,195	2,280	52%
Total	**7,929**	**17,700**	**45%**	**16,585**	**31,810**	**55%**
PM Peak Hour – Outbound						
East	2,915	6,300	46%	6,108	15,440	40%
West	4,645	10,590	44%	9,873	16,490	60%
North	440	660	67%	1,338	2,220	60%
Total	**8,000**	**17,550**	**46%**	**17,489**	**34,150**	**51%**

Figure 4-16: 2035 Planned Transit Network

As shown on Table 4-14, under the Future Baseline Condition without the Proposed Action, capacity utilization in the AM and PM peak periods is still well below the 80 to 90 percent threshold of significance for this analysis (this is the same threshold that was identified in the 2009 EIS). It should be noted that the directions presented in the table relate to the screenlines identified for purposes of analysis. A screenline is an imaginary line used to evaluate traffic flow across a boundary. The East screenline corresponds to Ward Avenue. The West screenline corresponds to Punchbowl Street. The North screenline corresponds to King Street[5].

4.7.4.6 Year 2035 Bicycle Circulation Without The Proposed Action

The Future Baseline Condition applies the proposed street network improvements from the existing Mauka and Makai Area Plans.

- No bicycle lanes are included in the Future Baseline Condition, based on the proposed street changes identified in the 2009 SEIS.

Based on the Mauka Area Plan EIS planning process in 2009, the following bikeway improvements were proposed for the Mauka Area:

- Suggested future restriping of existing four-lane roadways to accommodate bicycle lanes (but specific corridors were not identified at that time)
- Recommended change Cooke Street, Pohukaina Street, and Kamakee Street into bicycle-friendly streets that allow for safe bicycle connections to existing open space in the area (but no project extent, bikeway type, or facility recommendation was identified).

Compared to the Existing Condition, the Future Baseline Condition without the Proposed Action is expected to generate an additional 1,030 bicycle trips in the AM peak period and an additional 1,387 bicycle trips in the PM peak period. However, the projected increase in bicyclists is not yet supported by targeted safety or connectivity improvements under the Future Baseline Condition.

4.7.4.7 Year 2035 Pedestrian Circulation Without The Proposed Action

The Future Baseline Condition (existing Mauka and Makai Area Plans) proposes crosswalks at all intersections and sidewalks along all or most streets. These improvements are intended to better orient Kaka`ako's streets and buildings to pedestrians and improve pedestrian safety, particularly in Central Kaka`ako where many streets lack curbs and sidewalks.

In general, the Future Baseline Condition calls for a well-developed network of pedestrian-friendly streets with wide, landscaped sidewalks and active building frontage

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5 For purposes of consistency, screenlines correspond to those used in the 2009 Final Supplemental EIS for the Mauka Plan Rules, and do not necessarily correspond to geo-political boundaries.

that invites pedestrian traffic. Cooke Street, Pohukaina Street, and Kamakee Street are designated as "green" streets and connect pedestrians and bicyclists with park and open space facilities. Several streets (Auahi Street, Pohukaina Street, Ala Moana Boulevard, Punchbowl Street, Cooke Street, and Kamakee Street) are planned to undergo "Promenade" treatments with 15-foot sidewalks. This would be accomplished by a combination of either curb-to-curb width reduction and/or requiring redevelopment setbacks.

The Future Baseline Condition also proposes intersection improvements at:

- Cooke Street / Ala Moana Boulevard;
- Ward Avenue / Queen Street;
- Ward Avenue / Pohukaina Street;
- Ward Avenue / Ala Moana Boulevard;
- Kamakee Street / Ala Moana Boulevard; and,
- Piikoi Street / Ala Moana Boulevard.

These six intersections would be reconstructed with high visibility crosswalk design—such as ladder striping, flashing beacons, and improved signage—in order to encourage mauka-makai connectivity and improve crossing safety across major thoroughfares. The Future Baseline Condition also proposed planters, street furniture such as benches, and on-street parking to help create a buffer zone between pedestrians and street traffic. The planned widening of Ala Moana Boulevard from 72 to 84 feet (identified as a mitigation in the 2009 SEIS) would increase pedestrian crossing distances under Year 2035 conditions.

Compared to the existing condition, the Future Baseline Condition without the Proposed Action is expected to generate an additional 4,637 pedestrian crossings in the AM peak period and an additional 6,239 pedestrian crossings in the PM peak period. Given the projected increase in pedestrian crossings spread across the project area's pedestrian network, the lack of sidewalks along various industrial streets and pedestrian delay at some arterial signalized intersections could limit pedestrian circulation at some locations under the Future Baseline Condition.

4.7.5 Comparing 2035 Future Traffic Conditions With The Proposed Action To Baseline Conditions Without The Proposed Action And To Existing Conditions

This section provides a comparison of travel conditions in Year 2035 under the Proposed Action, focusing on TOD Alternative A. The travel demand forecast under Year 2035 conditions was derived from the OMPO Regional Model, based on the projected level of development under TOD Alternative A. It is important to remember the following when viewing these findings:

- Because the Proposed Action is an "overlay" on the current development rules for the Mauka Area and the Makai Area, future conditions forecast for 2035 are equivalent to the Future Baseline Condition PLUS the Proposed Action. In 2035,

the Proposed Action does not replace the Baseline Condition, it adds an optional development program to it, whether it be Alternative A or B.

4.7.5.1 Travel Mode and Trip Generation

The OMPO Regional Model was utilized to provide a forecast of trip generation based on Future Baseline Condition and Proposed Action land uses. The net change to trip generation was derived based on existing land uses under the OMPO Model Year 2015 Baseline scenario. Table 4-15 provides a summary of the travel demand forecast.

Based on the travel demand model forecast:

- **Total volume of travel:** Total daily person trips by all modes traveling to, from, or within the KCDD, would essentially double under the Future Baseline Condition, with a 98 percent increase over the Existing Condition. Under TOD Alternative A, total daily person trips by all modes would increase by 136 percent over the Existing Condition. The impact would be slightly less under TOD Alternative B.
- **Trips internal to the KCDD:** The portion of trips internal to the KCDD would increase from 36 percent under Existing Conditions to 51 percent under the Future Baseline Condition, with a further increase to 53 percent under TOD Alternative A, with a lesser impact under TOD Alternative B.

Table 4-15: Travel Demand Comparison

	Existing Condition (2015 Model Base Year)	Future Baseline Condition (2035 Model Baseline)	Future Baseline + Proposed Action (2035 TOD Alt. A)
Households	11,867	38,221	51,393
Net Change from Existing		26,354	39,526
Percent Increase over Existing		222%	333%
Retail Employment	7,916	16,840	15,706
Non-Retail Employment	28,303	44,739	39,923
Total Daily Person Trips	286,878	569,295	679,059
Net Change from Existing		282,417	392,181
Percent Increase over Existing		98%	136%
Internal Capture	36.7%	51.3%	53.2%
External Person Trips (daily)	181,594	277,247	317,800
Net Change from Existing		95,653	136,206
Percent Increase over Existing		53%	75%

Table 4-16 provides a comparison of travel mode choice predicted by the OMPO Regional Model forecast, which indicates that:

- Walk and bike trips would increase from 15.5 percent of total daily trips under Existing Conditions to:
  - 20.1 percent under the Future Baseline Condition

    - up to 21.7 percent of daily trips under the Proposed Action
- Motor vehicle trips would decrease from 77.3 percent of total daily trips under Existing Conditions to:
    - 71.3 percent of under the Future Baseline Condition
    - up to 69.6 percent under the Proposed Action
- Transit trips would increase from 7.2 percent of total daily trips under Existing Conditions to 8.7 percent under both the No Action and Proposed Action.

Table 4-16: Travel Mode Comparison

	Existing Conditions (2015 Model Base Year)	Future Baseline Condition (2035 Model Baseline)	Future Baseline + Proposed Action (2035 TOD Alt. A)
Public Transit	7.2%	8.7%	8.7%
Walk + Bike	15.5%	20.1%	21.7%
Motor Vehicles	77.3%	71.3%	69.6%

The OMPO Regional Model forecast of daily motor vehicle, transit and bike/walk trips under Existing and Year 2035 conditions, under both the Future Baseline Condition and Proposed Action, is shown in Table 4-17.

Table 4-17: Trip Generation Forecast – Proposed Action (TOD Alternative A)

	Motor Vehicle Trips			Transit Trips	Walk/ Bike Trips
	AM Peak Hour	**PM Peak Hour**	**Daily**	**Daily**	**Daily**
Total Trip Generation					
Existing Land Uses	13,822	9,249	184,797	20,655	44,466
Future Baseline Condition	25,380	28,313	338,256	49,528	114,428
Future Baseline + Proposed Action	27,191	30,783	393,854	59,078	147,356
Pct Increase over Existing	***97%***	***233%***	***113%***	***186%***	***231%***
Pct Change over Future Baseline Condition	***7%***	***9%***	***16%***	***19%***	***29%***
Net Trip Generation Comparison					
Future Baseline Condition	11,558	19,064	153,459	28,873	69,962
Future Baseline + Proposed Action	13,369	21,534	209,057	38,423	102,890
Proposed Action : Net Change over Future Baseline	***1,811***	***2,470***	***55,598***	***9,550***	***32,928***

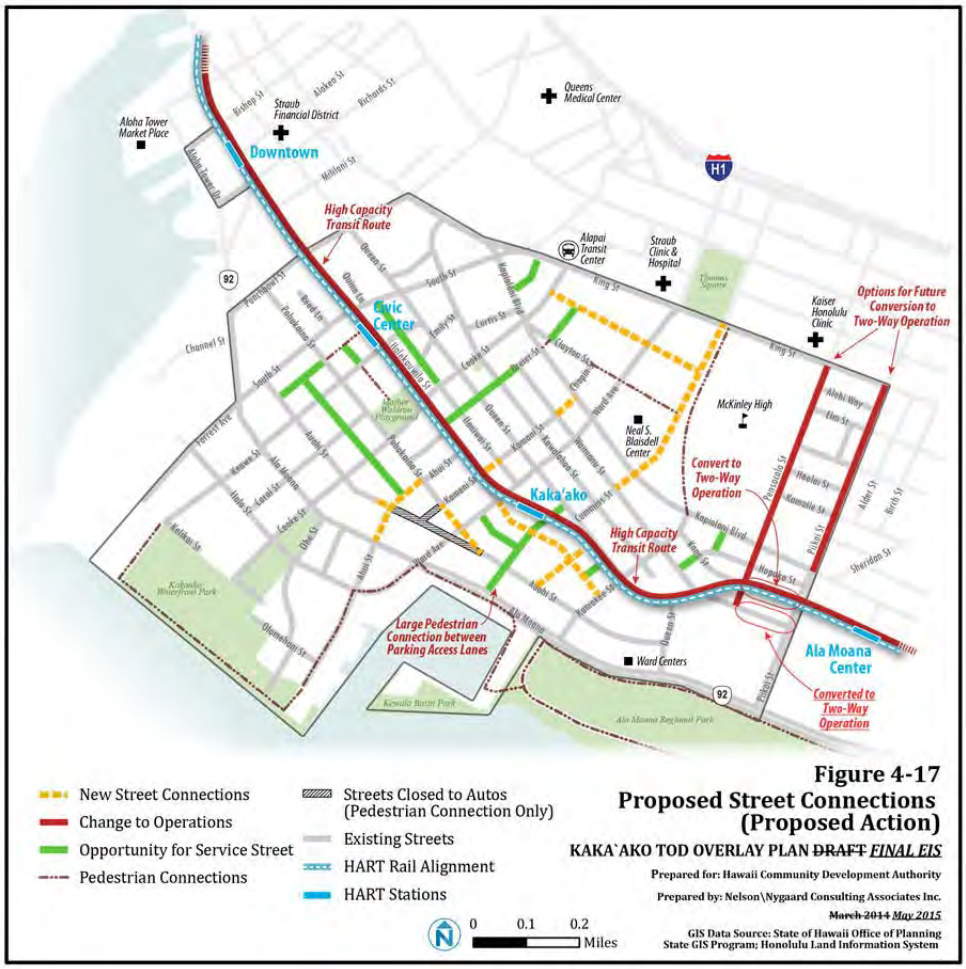
Based on this forecast, the Proposed Action will generate the following net increases in trips in comparison to the Future Baseline Condition:

- Walk/bike trips: up to 29 percent increase over the Future Baseline Condition
- Transit trips: up to 19 percent increase over the Future Baseline Condition
- Motor vehicle trips: up to 16 percent increase over the Future Baseline Condition based on daily trips, while the increase in peak-hour motor vehicle trips would be smaller:
    - up to 7 percent increase over the Future Baseline Condition during the AM Peak Hour
    - up to 9 percent increase over the Future Baseline Condition during the PM Peak Hour

4.7.5.2 Year 2035 Roadway Conditions With The Proposed Action

Potential changes to the roadway network under the Proposed Action described in TOD Alternative A include proposed roadway network connections to facilitate internal circulation within the KCDD as shown in Figure 4-17 ***(and discussed on page 5-15 of Appendix A)*** and the designation of priority streets for Motor Vehicles, Bicycles, and Pedestrians as shown on Figures 4-18 to 4-21.

Figure 4-17: Proposed Street Connections – Proposed Action



Analysis of the potential restoration of two-way operation on Piikoi and Pensacola Street was excluded from the analysis because the regional-serving character of the roadways, with their direct connections to the H-1 freeway, is beyond the scope of the present analysis.

Figure 4-18: Proposed Motor Vehicle Priority Streets – Proposed Action

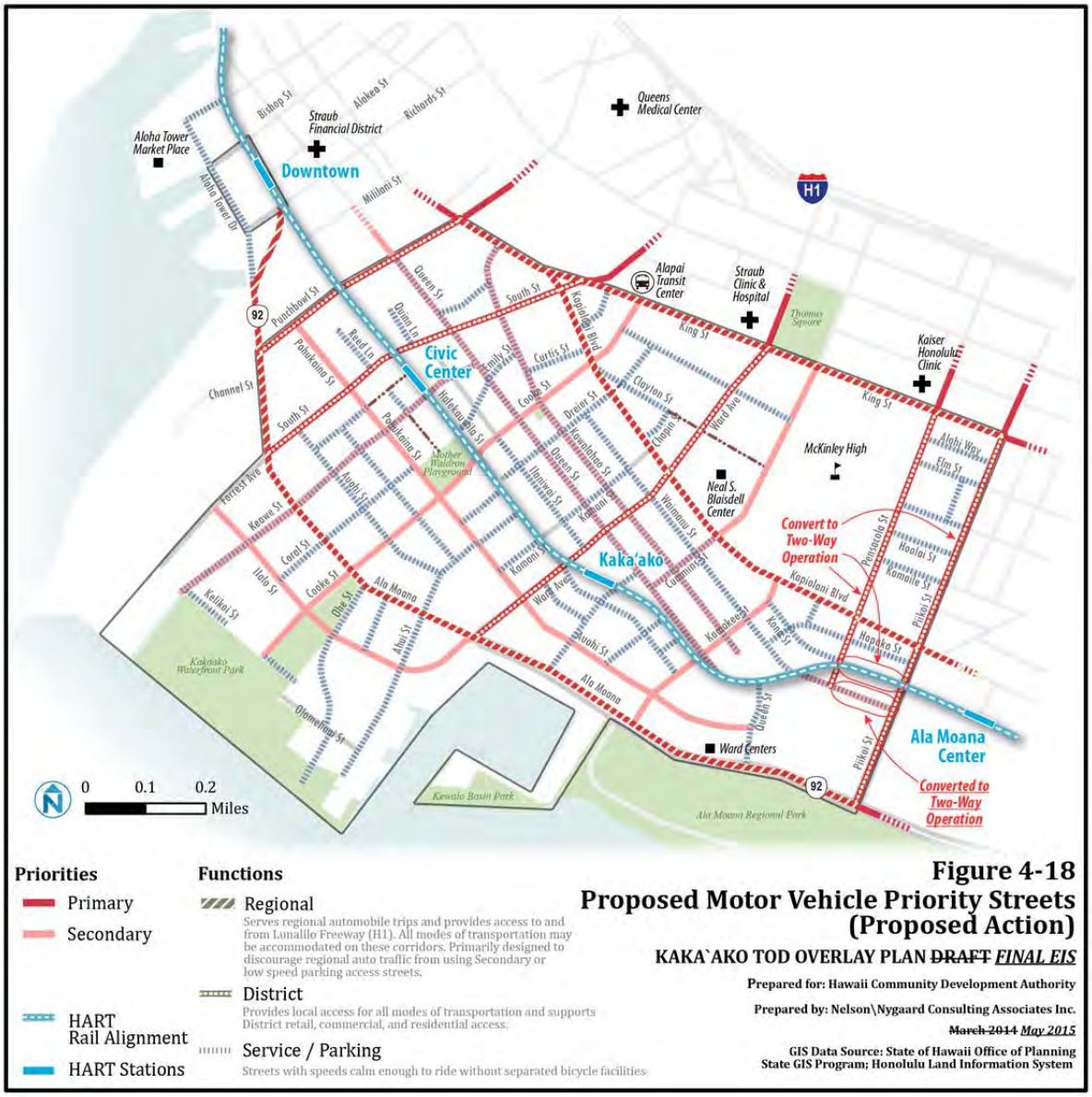


Figure 4-19: Proposed Bicycle Priority Streets – Proposed Action

Figure 4-20: Proposed Pedestrian Priority Streets

Figure 4-21: Year 2035 Traffic Volumes on Key Corridors – Proposed Action

4.7.5.3 Traffic Operations With The Proposed Action

Based on the anticipated change in traffic volumes comparing the Proposed Action model (TOD Alternative A) results to the Future Baseline Condition, the anticipated distribution of daily traffic volumes are shown on Figure 4-19. Detailed intersection volumes for each of the key study area intersections are shown in Figures 40 through 42 of the Traffic Study presented as Appendix D of this EIS.

4.7.5.4 Year 2035 Level of Service With The Proposed Action

Based on the forecasted peak hour traffic volume, Table 4-18 compares the Year 2035 projected Level of Service for key study area locations under both the Future Baseline Condition and the worst-case scenario under the Proposed Action (TOD Alternative A).

4.7.6 Traffic Impacts of the Proposed Action

Traffic impacts are considered significant if the worst-case scenario under the Proposed Action (TOD Alternative A) causes the level of service to deteriorate from LOS E or better under the Future Baseline Condition to LOS F under the Proposed Action. There are no intersections in the study area that deteriorate from LOS E or better under the Future Baseline Condition to LOS F under the Proposed Action.

Traffic impacts are also considered significant if the operational impacts on signalized intersections operating at LOS F under both the Future Baseline Condition and worst-case scenario under the Proposed Action if the volume to-capacity (v/c) ratio under the Proposed Action exceeds that of the Future Baseline Condition. The following study intersections would operate at LOS F under both the Future Baseline Condition and Proposed Action:

- Ala Moana & South (study intersection #6)
- Ala Moana & Cooke (study intersection #9)
- Ala Moana & Ward (study intersection #10)
- Queen & Ward (study intersection #17)
- Kapiolani & Ward (study intersection #2)

Additional study intersections would operate acceptably based strictly on volume/capacity ratios at each intersection, but could be impacted by downstream delay at adjacent intersections on Ala Moana Boulevard west of Ward Street:

- Ala Moana & Keawe (study intersection #7)
- Ala Moana & Coral (study intersection #8)
- Ala Moana & Koula (study intersection #38)

Table 4-18: 2035 Peak Hour Intersection Level of Service – Proposed Action (TOD Alternative A)

			Future Baseline Condition (2035 Baseline)		Future Baseline + Proposed Action (2035 TOD Alt. A)	
#	**Street Names**	**Control Type**	**AM LOS (Delay)**	**PM LOS (Delay)**	**AM LOS (Delay)**	**PM LOS (Delay)**
1a	South at Kapiolani	Signalized	C (21)	C (25)	C (25)	C (24)
1b	King at Alapai	Signalized	D (40)	C (22)	D (48)	C (23)
2	Ward at Kapiolani	Signalized	**F (>80)**	**F (>80)**	**F (>80)**	E (63)
3	Kamakee at Kapiolani	Signalized	A (<10)	D (44)	A (5)	C (33)
4	Pensacola at Kapiolani	Signalized	E (75)	E (78)	E (56)	C (27)
5	Piikoi at Kapiolani	Signalized	D (36)	C (24)	C (22)	C (26)
6	South/Forest at Ala Moana	Signalized	**F (>80)**	E (58)	**F (>80)**	E (58)
7	Keawe at Ala Moana	Signalized	*E (<80)	*D (<55)	*E (<80)	*D (<55)
8	Coral at Ala Moana	Signalized	*D (<55)	*D (<55)	*D (<55)	*D (<55)
9	Cooke at Ala Moana	Signalized	**F (>80)**	*E (<80)	**F (>80)**	*E (<80)
10	Ward at Ala Moana	Signalized	**F (>80)**	**F (>80)**	**F (>80)**	**F (>80)**
11	Kewalo Basin driveway at Ala Moana	Not signalized	A (<10)	A (<10)	A (>10)	A (>10)
12	Kamakee at Ala Moana	Signalized	C (22)	B (12)	E (71)	E (59)
13	Queen at Ala Moana	Signalized	B (14)	B (18)	B (12)	B (12)
14	Piikoi at Ala Moana	Signalized	C (26)	B (19)	D (38)	C (28)
15	Ward at Auahi	Signalized	B (17)	B (19)	B (17)	B (18)
16	Ward at Halakauwila	Signalized	A (<10)	B (14)	B (11)	B (12)
17	Ward at Queen	Signalized	C (33)	**F (>80)**	E (57)	**F (<80)**
18	Piikoi at Auahi	Signalized	B (14)	B (14)	B (13)	B (14)
19	Piikoi at Waimanu	Signalized	C (25)	B (20)	C (29)	B (19)
20	Piikoi at Kona	Signalized	B (12)	B (16)	B (14)	B (18)
21	Pensacola at Waimanu	Signalized	D (49)	D (51)	D (52)	D (48)
22	Queen at Kamakee	Signalized	C (21)	D (52)	C (28)	D (52)
23	Kamakee at Auahi	Signalized	C (23)	C (31)	C (30)	C (32)
24	Ward Entertainment Center driveway at Auahi	Signalized	A (<10)	B (11)	A (<10)	B (11)
25	Ward Warehouse driveway at Auahi	Signalized	A (<10)	A (<10)	A (<10)	A (<10)
26	South at Pohukaina	Signalized	B (19)	C (22)	C (23)	C (21)
27	South at Halakauwila	Signalized	B (23)	C (25)	B (13)	C (23)
28	Queen at South	Signalized	B (18)	C (22)	B (18)	C (21)
29	Coral/Emily at Queen	Signalized	A (<10)	A (<10)	B (11)	A (<10)
30	Cooke at Queen	Signalized	B (18)	E (78)	B (20)	E (76)
31	Cooke at Halakauwila	Planned signal*	B (19)	B (16)	B (16)	B (15)
32	Cooke at Pohukaina	Planned signal*	B (14)	B (13)	C (29)	B (14)

Table 4-18 (continued)

			Future Baseline Condition (2035 Baseline)		Future Baseline + Proposed Action (2035 TOD Overlay)	
#	**Street Names**	**Control Type**	**AM LOS (Delay)**	**PM LOS (Delay)**	**AM LOS (Delay)**	**PM LOS (Delay)**
34	Cooke at Ilalo	TWSC	A (<10)	A (<10)	A (<10)	A (<10)
35	Keawe at Ilalo	TWSC	B (12)	B (14)	A (<10)	B (15)
36	Ahui at Ilalo/Ward	AWSC	B (12)	C (15)	B (12)	C (16)
37	Ahui at Ala Moana	TWSC	A (<10)	A (<10)	B (12)	A (<10)
38	Koula at Ala Moana	Signalized	*C (<35)	*E (<80)	*C (<35)	*E(<80)
39	Ohe at Ala Moana	TWSC	D (31)	C (17)	D (31)	C (20)
40	Ilaho at Koula	TWSC	B (11)	B (11)	B (11)	B (11)
41	Ohe at Ilalo	TWSC	B (13)	C (18)	B (13)	C (17)
42	Ahui at Olomehani	TWSC	A (<10)	A (<10)	A (>10)	A (>10)
43	Driveway/Ohe at Olomehani	TWSC	A (<10)	A (<10)	A (>10)	A (>10)
44	Ala Moana at Alakea	Signalized	B (14)	B (13)	B (17)	B (13)
45	Bishop at Ala Moana	Signalized	C (26)	E (57)	C (22)	D (46)
46	Fort at Ala Moana	Signalized	A (<10)	A (<10)	A (<10)	A (<10)
47	Alakea at King	Signalized	C (26)	D (50)	D (44)	C (35)
48	Bishop at King	Signalized	C (30)	E (71)	C (22)	E (75)
Intersections shown in bold operate at LOS F under the Future Baseline Condition and Proposed Action.						
*LOS as shown reflects downstream delay. **Intersection LOS based on planned signalization described as mitigation in 2009 EIS.						

The identified intersections were analyzed to determine whether significant traffic impacts might exist.

Ala Moana & South: Intersection is forecast to operate at LOS F under peak-hour conditions based on the Year 2035 traffic forecast under both the Future Baseline Condition and the worst-case scenario under the Proposed Action. Since the volume to-capacity (v/c) ratio under the Proposed Action exceeds that of the Future Baseline Condition, this impact is significant. *Finding: potentially significant.*

Ala Moana & Keawe: The volume to-capacity (v/c) ratio at this intersection would be acceptable under both the worst-case scenario of the Proposed Action and Future Baseline Condition. However, downstream delay results in delay that could affect the operation of this intersection. *Finding: less than significant.*

Ala Moana & Coral: The volume to-capacity (v/c) ratio at this intersection would be acceptable under both the worst-case scenario under the Proposed Action and the Future Baseline Condition. However, downstream delay results in delay that could affect the operation of this intersection. *Finding: less than significant.*

Ala Moana & Cooke: Intersection is forecast to operate at LOS F under peak-hour conditions based on the Year 2035 traffic forecast under both the Future Baseline Condition and the worst-case scenario under the Proposed Action. Since the volume to-capacity (v/c) ratio under the Proposed Action exceeds that of the Future Baseline Condition, this impact is significant. *Finding: potentially significant.*

Ala Moana & Koula: The volume to-capacity (v/c) ratio at this intersection would be acceptable in both the worst-case scenario under the Proposed Action and Future Baseline Condition. However, downstream delay results in delay that could affect the operation of this intersection. *Finding: less than significant.*

Ala Moana & Ward: Intersection is forecast to operate at LOS F under peak-hour conditions based on the Year 2035 traffic forecast in both the Future Baseline Condition and the worst-case scenario under the Proposed Action. Since the volume to-capacity (v/c) ratio in the Proposed Action exceeds that of the Future Baseline Condition, this impact is significant. *Finding: potentially significant.*

Queen & Ward: Intersection is forecasted to operate at LOS F under peak-hour conditions based on the Year 2035 traffic forecast in both the Future Baseline Condition and the worst-case scenario under the Proposed Action. Since the volume to-capacity (v/c) ratio under the Proposed Action exceeds that of the Future Baseline Condition, this impact is significant. *Finding: significant and unavoidable impact (SU). No feasible mitigations as described in the 2009 EIS.*

Kapiolani & Ward: Intersection is forecast to operate at LOS F under peak-hour conditions based on the Year 2035 traffic forecast in both the Future Baseline Condition and Proposed Action. Since the volume to-capacity (v/c) ratio under the worst-case scenario under the Proposed Action exceeds that of the Future Baseline Condition, this impact is significant. The 2009 EIS included the finding that no mitigation would be feasible at this intersection; therefore this impact was identified as significant and unavoidable. *Finding: potentially significant.*

4.7.7 Transit Impacts of the Proposed Action

The fixed guideway ~~transit~~ ***light metro rail*** system ~~– HART -~~ is presently under construction. ~~HART~~ ***It*** will provide faster, more reliable transit along the corridor where many transit vehicles must operate in mixed-flow traffic, and serve as an attractive alternative to the private automobile. The project would strengthen the connection between Kapolei, Downtown Honolulu and Kaka`ako~~, UH Manoa, and Waikiki~~.

A major goal of the Proposed Action is to encourage transit oriented development. The Proposed Action is intended to facilitate and encourage transit use by placing relatively high-density development adjacent to or within easy walking access of major transit facilities such as stations on the fixed guideway system or transfer points between bus lines. TOD projects also typically encourage the use of non-motorized modes of travel, including pedestrian and bicycle travel, and discourage the use of private automobiles.

For the purposes of analysis, Proposed Action capacity was taken from the 2009 EIS. Proposed Action ridership was estimated using the following assumptions:

- Based on a comparison of the Future Baseline Condition (2035 Baseline) and Proposed Action (2035 TOD Plan) outputs from the OMPO model, the Proposed Action will generate approximately 10,000 additional transit riders per day (net change compared to the Action).
- The assumption was made that 10 percent of daily transit trips will occur during the peak-hour. Therefore, 10,000 daily riders would correlate to 1,000 peak-hour riders in the AM peak and 1,000 peak-hour riders in the PM.
- Using the model, the 1,000 additional trips were assigned to the east, west, and north screenlines proportionally.

The resulting capacity and utilization for the Proposed Action transit analysis is presented in Table 4-19.

Table 4-19: Proposed Action Transit Capacity Utilization

	Existing Conditions			Future Baseline Condition			Future Baseline + Proposed Action		
Screenline	Ridership	Capacity	Capacity Utilization	Ridership	Capacity	Capacity Utilization	Ridership	Capacity	Capacity Utilization
AM Beak Hour - Inbound									
East	2,943	6,720	44%	5,771	13,850	42%	5,430	13,850	39%
West	4,635	10,500	44%	9,732	15,680	62%	10,814	15,680	69%
North	351	480	73%	1,198	2,280	53%	1,195	2,280	52%
Total	7,929	17,700	45%	16,701	31,810	53%	17,439	31,810	55%
PM Peak Hour – Outbound									
East	2,915	6,300	46%	6,194	15,440	40%	5,825	15,440	38%
West	4,645	10,590	44%	9,954	16,490	60%	11,010	16,490	67%
North	440	660	67%	1,341	2,220	60%	1,341	2,220	60%
Total	8,000	17,550	46%	17,489	34,150	51%	18,173	34,150	53%

The fixed guideway system is expected to substantially increase capacity in the west and east screenlines. The guideway system is also expected to draw new riders to transit because of its improvement over existing bus services in terms of speed, reliability, and frequency, thus causing an increase in ridership across the west screenline. Given the increased capacity from the fixed guideway system, however, utilization will still be below the 80 to 90 percent threshold typically considered acceptable for urban areas. Peak hour screenline results are summarized on Figures 44 and 45 of the Traffic Study presented in Appendix D of this EIS.

Based on the transit impact criteria described in the 2009 EIS, transit impacts are considered significant if:

- The plan causes a substantial increase in transit demand that could not easily be accommodated by available transit capacity, resulting in unacceptable levels of transit crowding. Capacity utilization above 80 to 90 percent is generally considered unacceptable for urban transit services.
- The plan causes a substantial increase in operational delay or costs that could result in adverse impacts to transit service.

The fixed guideway system is expected to substantially increase capacity on the west and east screenlines. The capacity utilization on all screenlines (north, east, and west) in the AM and the PM peak is not expected to exceed 69%. Therefore, there is no significant transit impact resulting from the Proposed Action and no additional mitigations are required.

Regarding operational delay, traffic delay under the Proposed Action is not anticipated to result in a level of delay to buses that would require additional buses or operating costs compared to the Future Baseline condition. Therefore, there is no significant transit operations impact resulting from the Proposed Action and no additional mitigations are required.

4.7.8 Bicycle Circulation Impacts of the Proposed Action

4.7.8.1 Bicycle Circulation Recommendations in the Proposed Action

The Proposed Action improves several forms of bikeway types as compared to the Future Baseline Condition to ensure greater separation from motor vehicle traffic, and proposes additional bikeways to facilitate east-west and north-south bicycle connectivity and safe bicycle operation. The Draft TOD Overlay Plan recommends the following revisions to the Future Baseline Condition bicycle network:

- Bike lanes on King Street from Piikoi Street to Punchbowl Street;
- Cycle track (path)[6] or bike lanes on Ala Moana Boulevard from Piikoi Street to the Ewa edge of the Aloha Tower Special District;
- Cycle track (path) or bike lane couplet on Punchbowl Street and South Street between King Street and Ala Moana Boulevard;
- Signed and marked bike route on Queen Street from Kamakee Street to Punchbowl Street;
- Cycle track (path) or bike lanes on Halekauwila Street from Ward Avenue to the Diamond Head edge of the Aloha Tower Special District;

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[6] A cycle track is a dedicated bicycle facility type that is physically separated from adjacent travel lanes by bollards, planters, on-street parking, curbs, or any other raised material. Cycle tracks can be situated at street level, between sidewalk and street level, or at sidewalk level.

- Signed and marked bike route on Auahi Street from Ala Moana Boulevard to Ward Avenue;
- Signed and marked bike route on Ilalo Street from Ahui Street and Keawe Street;
- Bike lanes on Cummins Street (developed with proposed street extension);
- Bike lanes on Ward Avenue from King Street and Ala Moana Boulevard;
- Bike lanes on Kamakee Street between Kapiolani Boulevard and Ala Moana Boulevard;
- Cycle track (path) or bike lane couplet on Pensacola Street from King Street to Punchbowl Street and Piikoi Street from King Street to Ala Moana Boulevard;
- Signed and marked bike routes on Pohukaina Street from Ward Avenue to Punchbowl Street;
- Bike path connecting the Ala Moana Regional Park multi-use path to the Kaka`ako Waterfront Park multi-use path (via Ahui Street); and
- Bike path between the Neil S. Blaisdell Center and McKinley High School connecting the Kamakee Street end with King Street

The recommended improvements listed above and displayed in Figure 4-17 only address bikeway project extents within the project area. <u>However, it is important to note that these recommended improvements are not stipulated as part of the Proposed Action because HCDA does not have jurisdiction over streets in Kaka`ako.</u> Thus, the recommendations in the Draft TOD Overlay Plan are only strategies and are not required improvements.

4.7.8.2 Summary of Findings of Significance

The following list encapsulates the potential impacts that could be observed along key bicycle corridors throughout the project area, as many corridors exhibit a variety of impacts. These impact types are based on the significance criteria listed in Section 4.7.2, the change in bicycling movements between the Future Baseline Condition and Proposed Action, and the ability of the Future Baseline Condition to connect the forecast increase in bicyclists with existing and new destinations based on the Year 2035 Land Use Comparison.

- Up to a threefold increase in daily bicycle volumes with no commensurate or appropriate increase in bicycle capacity.
- Lack of east-west connectivity to support the substantial increase in bicycle volumes (definition of substantial increase depends on the corridor).
- Lack of north-south connectivity to support the substantial increase in bicycle volumes (definition of substantial increase depends on the corridor).
- Lack of bicycle facilities to facilitate access to all three rail stations.
- Substantial increase in turn volumes at a number of intersections along key bicycle corridors increases exposure to collision.

Compared to the Future Baseline Condition, the Proposed Action is expected to generate up to an additional 485 bicycle trips in the AM peak period and up to an additional 652

bicycle trips in the PM peak period. The increase in AM and PM peak period bicycle movements is summarized in Table 4-20.

Table 4-20: Bicycle Volumes – Proposed Action

	Existing Condition (2015 Model Baseline)	Future Baseline Condition (2035 Model Baseline)	Future Baseline + Proposed Action (2035 TOD Alt A)	Future Baseline + Proposed Action (Percent Change over Existing)	Proposed Action (Percent Change over Future Baseline)
Daily	8,084	20,805	26,792	231%	29%
AM Peak Hour	654	1,685	2,170	231%	29%
PM Peak Hour	881	2,267	2,920	231%	29%

The following corridors would exhibit impacts in as a result of the Proposed Action based on one or more of the potential impacts listed in the section above. *In each impacted corridor, up to a 331% increase in peak period bicycle volumes (from existing bicycle volumes to Proposed Action conditions) and up to a 129% increase in peak period bicycle volumes (from Future Baseline Condition bicycle volumes to Proposed Action conditions) with no corresponding available bicycle capacity triggers a significant impact.* Although bike sharing is not included in the analysis, bike share implementation (projected to produce between 1.6 and 2.1 million trip per year) will make the lack of bicycle capacity an even more severe issue. In addition, because none of the corridors that offer direct travel are furnished with dedicated bicycle facilities, increased auto turn volumes are assumed to create a potentially significant impact.

Punchbowl Street: As part of the South-Punchbowl one-way couplet, Punchbowl Street is a critical southbound bicycle connection on the Ewa boundary of the project area. The projected increase in bicycle volumes along Punchbowl Street is not supported by dedicated bicycle facilities. Punchbowl Street is also a key bicycle access route to future ~~HART~~ ***light metro rail*** stations for bicyclists originating mauka of the H1 freeway. Each of these factors and the increase in bicycle volume between the Future Baseline Condition and Proposed Action contributes to a significant impact.
Finding: Potentially significant

South Street: As part of the South-Punchbowl one-way couplet, South Street is a critical northbound bicycle connection on the Ewa boundary of the project area. This corridor currently accommodates up to 440 daily bicycle movements.[7] The projected increase in bicycle volumes (AM, PM, and daily bicycle trips) along South Street is not supported by

[7] Daily bicycle movements were extrapolated from AM and PM peak period (2-hour) bicycle counts.

dedicated bicycle facilities. South Street is also a key bicycle access route from the future HART Civic Center Station for bicyclists destined for points mauka of the H1 freeway. Each of these factors and the increase in bicycle volumes between the Future Baseline Condition and Proposed Action contributes to a significant impact. *Finding: Potentially significant*

Cooke Street: Cooke Street is a critical north-south bicycle connection that provides direct access to the future HART Civic Center Station. This corridor currently accommodates up to 512 daily bicycle movements. Cooke Street is anticipated to exhibit a 48% increase in motor vehicle turn volumes at Pohukaina Street, which will increase bicycle exposure to turn conflicts. Because this is a key transit access route, there is an effective increase in bicycle conflicts, and there is a substantial projected increase in bicycle volumes (both due to demand for transit access and intra-district travel), Cooke Street's lack of dedicated bicycle facilities with a corresponding increase in bicycle volume between the Future Baseline Condition and Proposed Action contributes to a significant impact. *Finding: Potentially significant*

Ward Avenue: Bisecting the project area, Ward Avenue is a key north-south bicycle connection that provides direct access to the future HART Kaka`ako Station and facilitates bicycle movement between the project area and areas mauka of the H1 freeway. This corridor currently accommodates up to 880 daily bicycle movements. Because this is a key transit access route, and there is a substantial projected increase in bicycle volumes between the Future Baseline Condition and Proposed Action (both due to demand for transit access and intra-district travel), Ward Avenue's lack of dedicated bicycle facilities is considered a significant impact. *Finding: Potentially significant*

Halekauwila Street: Although Halekauwila Street currently only accommodates up to 288 daily bicycle movements, this corridor will serve as a critical east-west bicycle connection. Given its alignment under the ~~HART~~ ***light metro*** rail alignment, Halekauwila Street provides direct access to the future Civic Center, Kaka`ako, and Downtown Stations. Because this is a key transit access route, and there is a substantial projected increase in bicycle volumes between the Future Baseline Condition and Proposed Action (both due to demand for transit access and intra-district travel), Halekauwila Street's lack of dedicated bicycle facilities with a corresponding increase in bicycle volume between the Future Baseline Condition and Proposed Action contributes to a significant impact. *Finding: Potentially significant*

Pensacola Street: Pensacola Street is a critical southbound bicycle connection at the Diamond Head edge of the project area. This corridor currently accommodates up to 288 daily bicycle movements. The projected increase in bicycle volumes along Pensacola Street between the Future Baseline Condition and Proposed Action is not supported by dedicated bicycle facilities. Pensacola Street is also a key bicycle access route to two future stations (Kaka`ako Station and Ala Moana Station) and Ala Moana Center for bicyclists originating from the Makiki neighborhood. Because this is a key transit access route, and there is a substantial projected increase in bicycle volumes between the Future Baseline Condition and Proposed Action (both due to demand for transit access and intra-

district travel), Pensacola Street's lack of dedicated bicycle facilities is considered a significant impact.

The City and County of Honolulu has expressed interest in potentially converting the Pensacola-Piikoi one-way couplet into two-way operation while providing high quality bicycle facilities. This should be studied in the future. *Finding: Potentially significant*

Piikoi Street: Piikoi Street is a critical northbound bicycle connection at the Diamond Head edge of the project area. This corridor currently accommodates up to 380 daily bicycle movements. Piikoi Street is anticipated to exhibit a 30% increase in motor vehicle turn volumes at Ala Moana Boulevard, which will increase bicycle exposure to turn conflicts. The projected increase in bicycle volumes along Piikoi Street between the Future Baseline Condition and Proposed Action is not supported by dedicated bicycle facilities. Piikoi Street is also provides bicycle egress from two future stations (Kaka`ako Station and Ala Moana Station) and Ala Moana Center, particularly for bicyclists destined for the Makiki neighborhood. Piikoi Street is anticipated to exhibit a 30% increase in motor vehicle turn volumes at Ala Moana Boulevard, which will increase bicycle exposure to turn conflicts. Because this is a key transit egress route, and there is a substantial projected increase in bicycle volumes between the Future Baseline Condition and Proposed Action (both due to demand for transit access and intra-district travel), Piikoi Street's lack of dedicated bicycle facilities is considered a significant impact. The City and County has expressed interest in potentially converting the Pensacola-Piikoi one-way couplet into two-way operation while providing high quality bicycle facilities. This should be studied in the future. *Finding: Potentially significant*

A bicycle and pedestrian crossing improvement at the King Street/Cooke Street intersection is recommended as a potential *future* improvement measure. This would help link cyclists between the project area/Civic Center station and the Alapai Transit Center/Young Street signed and marked bike route (an east-west connection). This improvement is not recommended as a mitigation measure in this EIS due to the location of the improvement relative to the project area (it is not under the jurisdiction of the HCDA).

4.7.9 Pedestrian Circulation Impacts of the Proposed Action

4.7.9.1 Pedestrian Circulation Recommendations in the Proposed Action

The pedestrian recommendations in the Proposed Action seek to develop a high-quality pedestrian environment in the KCDD in order to achieve the goals of a lively, active, and transit-oriented community. Figure 4-22 illustrates where pedestrian investment is recommended as the district develops and the Proposed Action is realized. These recommended improvements are not stipulated as part of the Proposed Action because the street network remains under the jurisdiction of the City and County of Honolulu. Thus, the recommendations in the Proposed Action are only strategies and are not required improvements.

The pedestrian priority types recommended in the Proposed Action include:

- **Primary pedestrian priority streets** are those that connect key destinations in or adjacent to the district, including rail stations, and that will ultimately support active street front uses such as retail stores, public plazas, and entertainment venues. These streets require spacious sidewalks and a high level of pedestrian amenity.
- **Secondary pedestrian priority streets** are those that do not provide direct connections to major destinations or have very high traffic volumes. While these streets may never be ideal for walking along for long distances, they must still be safe enough to accommodate walking, and they should be easy and safe enough to cross that they do not serve as a barrier to pedestrians.
- **Low speed streets** are generally service streets that may have narrow widths and where pedestrians and traffic may even be asked to mix in a shared right-of-way. Note that the term "low speed streets" should not be interpreted to suggest that high-speeds are promoted anywhere in the project area.
- **Greenway connections** are streets where there is opportunity to connect parks, green space, and public plazas with well-landscaped, shaded, and interesting walking routes.

Other pedestrian network changes recommended in the Proposed Action relate to conflict reduction, sidewalk expansion, and crossing distance reduction. Any street with on-street parking is proposed to include curb extensions at intersections. Driveway consolidation is proposed throughout the project area to reduce conflicts between motor vehicles and pedestrians and improve pedestrian safety. Building access is concentrated at smaller parking access or service streets in order to reduce search-for-parking traffic and eliminate conflicts with pedestrians. In addition, 5 feet of additional setback is recommended to achieve minimum 15 feet sidewalk widths. This is particularly critical in station areas, which will see an injection of pedestrian activity for at least 18 hours of the day. Mid-block crossings are also proposed to reduce some of the larger block sizes (those over 600-700 feet) and facilitate access to rail stations.

4.7.9.2 Summary of Findings of Significance

The following list encapsulates the potential impacts that could be observed along pedestrian corridors throughout the project area. These impact types are based on the significance criteria listed in Section 4.7.2, the change in pedestrian crossings between the Future Baseline Condition and the worst-case scenario of the Proposed Action, and the ability of the Future Baseline Condition to connect an increase in pedestrians with existing and new destinations based on the Year 2035 Land Use Comparison. Potential impacts for each corridor include:

- Threefold increase in daily pedestrian crossings with no commensurate or appropriate increase in pedestrian capacity.
- Pedestrian delay with the increase in pedestrian volumes (over 80 seconds of delay is the threshold for pedestrians). Average delay for all travelers is increasing

because as traffic disperses across the network away from overcapacity streets like Ala Moana Boulevard

- Prevalence of long crossing distances (depends on curb-to-curb width and underutilization of pavement space). Shorter crossing distances (achieved by limited intersection skew, corner radii, and/or availability of curb extensions) increase the effective pedestrian queuing capacity at intersection corners.
- Lack of pedestrian facilities to facilitate access to all three rail stations.
- Lack of adequate sidewalks to meet future pedestrian demand.

Figure 4-22: Recommended Pedestrian Network from the Draft TOD Overlay Plan (see Appendix A)

Compared to the Future Baseline Condition, the Proposed Action is expected to generate an additional 2,182 pedestrian crossings in the AM peak period and an additional 2,937 pedestrian crossings in the PM peak period. The increase in AM and PM peak period pedestrian crossings is summarized in Table 4-21.

Table 4-21: Pedestrian Volumes – Proposed Action

	Existing Condition (2015 Model Baseline)	Future Baseline Condition (2035 Model Baseline)	Future Baseline + Proposed Action (2035 TOD Alt A)	Future Baseline + Proposed Action (Percent Change over Existing)	Proposed Action (Percent Change over Future Baseline)
Daily	36,381	93,622	120,564	231%	29%
AM Peak Hour	2,946	7,583	9,765	231%	29%
PM Peak Hour	3,965	10,204	13,141	231%	29%

The following corridors would exhibit impacts in both the Proposed Action and Future Baseline Condition based on one or more of the potential impacts listed in the discussion above. In each impacted corridor, up to a 331% increase in peak period pedestrian crossings (from existing pedestrian crossings to Proposed Action conditions) and up to a 129% increase in peak period pedestrian crossings (from Future Baseline Condition pedestrian crossings to Proposed Action conditions) with no corresponding increase in pedestrian capacity triggers a significant impact. Some impacts are demonstrated throughout the district or along multiple corridors. These types of impacts are aggregated into a general "All corridors" category.

All corridors (district-wide impacts): A number of corridors throughout the project area exhibit a range of impacts stemming from the project area's increase in pedestrian activity between the Future Baseline Condition and Proposed Action. These include:

- A limited number of dedicated crosswalk facilities along each corridor funnels pedestrian volumes to a limited number of crossing locations (triggering a capacity impact) or encouraging crossing at unmarked intersections or at unmarked mid-block locations (triggering a safety impact due to reduced pedestrian visibility).
- Current crossing distances extend pedestrian's exposure time to motor vehicles (triggering a safety impact) and reduce the person throughput of cross walk facilities (i.e., short crossings exhibit greater pedestrian crossing capacity per pedestrian phase).

- The increase in pedestrian volumes between the Future Baseline Condition and Proposed Action will create some crowding issues on various commercial corridors with sidewalks widths less than 10 feet.

Finding: Each impact listed above is potentially significant

**Central Kaka`ako industrial streets:** Because of the industrial character of Central Kaka`ako, most streets in this neighborhood are not furnished with sidewalks or curbs. In addition, delivery trucks, cars, and mopeds are parked in different patterns and even double-parked. The lack of adequate sidewalk facilities and haphazard parking arrangement creates conflicts with pedestrians and reduces the potential utility of several direct and relatively calm streets that could provide access to future stations. These conditions, coupled with an increase in pedestrian volumes, factor into triggering an impact on the following streets:

- Waimanu Street
- Kawalahao Street
- Queen Street
- Hopaka Street
- Coral Street
- Kona Street
- Cummins Street
- Kamani Street
- Ilaniwai Street

HCDA has worked with the Central Kaka`ako community and determined that the industrial character of the area should remain. Curbless, shared street designs should be sought in order to reduce conflicts, create pockets of pedestrian space and ensure safe coexistence of street space between all users. *Finding: Potentially significant*

Ala Moana Boulevard (signal timing improvements): Intersections along Ala Moana Boulevard experience substantial pedestrian delay for an urban district. For the purposes of this assessment, over 80 seconds of delay is considered the impact threshold for pedestrians. Using Ala Moana Boulevard's intersection with Ward Avenue as an example, this intersection exhibits 140-second signal cycles—70 seconds to Ala Moana, 70 seconds to Ward. This cycle timing is inefficient and creates unacceptable delay. Pedestrians crossing Ala Moana are provided 35 seconds per pedestrian phase with 7 seconds of GREEN WALK time. With the projected increase in pedestrian volumes between the Future Baseline Condition and the worst-case scenario under the Proposed Action, unmitigated pedestrian delay can compound sidewalk and intersection queuing capacity issues. This constitutes an impact. *Finding: Potentially significant*

Ala Moana Boulevard (pedestrian improvements): Ala Moana Boulevard is not a key station access route, but it serves as the most direct east-west pedestrian and bicycle connection between Kaka`ako and Waikiki. This corridor currently accommodates up to

215 and 269 pedestrian crossings in the AM and PM peaks, respectively.[8] This is anticipated to increase threefold between the Existing and Proposed Action timeframes. Crossings between the Future Baseline Condition and the worst-case scenario under the Proposed Action are projected to increase 29%.

The likelihood of sidewalk riding by bicyclists due to the current traffic conditions can increase pedestrians' exposure to collisions with bicycles. With the simultaneous increase in pedestrians and bicyclists using sidewalks (because of the lack of bicycle facilities along Ala Moana Boulevard), the increased number of conflicts between these two modes triggers a significant impact. *Finding: Potentially significant*

4.7.10 Recommended Measures to Mitigate Significant Impacts

Recommendations to mitigate the traffic, bicycle and pedestrian impacts described in the Proposed Action are described in this section. Not all impacts can be fully mitigated, resulting in identified significant and unavoidable impacts at a limited number of specific locations.

4.7.10.1 Traffic Mitigations

Table 4-22 summarizes the potential traffic impacts, based on the findings of the analysis of the Proposed Action, and describes recommended mitigation measures.

4.7.10.2 Transit Mitigations

Impacts to transit capacity and operations resulting from the Project were found to be less than significant. Therefore, no transit mitigations are required.

4.7.10.3 Bicycle Mitigations

Table 4-23 summarizes the significant, yet avoidable bicycle impacts for the Future Baseline Condition and Proposed Action with their corresponding mitigation measures.

4.7.10.4 Pedestrian Mitigations

Table 4-24 summarizes the significant, yet avoidable pedestrian impacts for the Future Baseline Condition and Proposed Action with their corresponding mitigation measures.

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8 This equates to roughly 3,872 daily crossings.

Table 4-22: Motor Vehicle Traffic Mitigations

Impacted Locations	Proposed Motor Vehicle Mitigation			Impact Finding with Mitigation	
	Impact Finding	Potential Mitigation	Secondary Impact of Mitigation	Level of Significance with Mitigation	Recommendation
Ala Moana & South	LOS F under Future Baseline Condition. Proposed Action would increase V/C.	Increase allocation of green time per cycle to Ala Moana.	Increased delay to side-street motorists, bicyclists and pedestrians.	Intersection remains at LOS F due to side-street delay.	Trip reduction mitigation to achieve 9% reduction in PM Peak Hour Traffic Volume (below model-forecasted volumes).
Ala Moana & Cooke					
Ala Moana & Ward	LOS F under Future Baseline Condition. Proposed Action would increase V/C.	Restripe north/south approaches to eliminate split signal phases. Reduce length of east-leg pedestrian crossing.	On east-leg only: would require wider curb-to-curb width.	Intersection remains at LOS F due to side-street delay.	
Queen & Ward	LOS F under Future Baseline Condition. Identified as significant and unavoidable in 2009 Kaka`ako Mauka Plan SEIS.	N/A	N/A	N/A	N/A
Kapiolani & Ward	LOS F under Future Baseline Condition. Identified as significant and unavoidable in 2009 Kaka`ako Mauka Plan SEIS.	N/A	N/A	N/A	N/A

Table 4-23: Bicycle Mitigations

Impacted Corridors	Proposed Bicycle Mitigation			Impact Finding with Mitigation	
	Impact Finding	Mitigation	Secondary Impact	Bicycle Impact	Secondary Impact
Punchbowl Street	Potentially significant due to forecasted increase in bicycle volume and lack of bicycle capacity.	Restripe with bollard-protected bike lane.	N/A – bicycle lane can be accommodated with restriping.	Less than significant.	N/A
South Street		Restripe with bollard-protected bike lane.	Removal of on street parking on one side.	Less than significant.	Less than significant – no reduction in traffic lane capacity.
Cooke Street		Restripe with 3 lanes and bike lanes	Removal of one motor vehicle travel lane.	Less than significant.	Less than significant – traffic LOS would remain acceptable.
Ward Avenue		Install bicycle lanes.	Removal of on-street parking.	Less than significant.	Less than significant – no reduction in traffic lane capacity.
Pensacola Street		Restripe with bike lane; study potential two-way conversion with 3 lanes and bike lanes	N/A – bicycle lane can be accommodated with restriping.	N/A	N/A
Piikoi Street*		Restripe with bollard-protected bike lane; study potential two-way conversion with 3 lanes and bike lanes	Bicycle lane can be accommodated with restriping. Potential impact from bollard.	N/A	N/A
Halekauwila Street		Construct cycle track or stripe bike lanes; cycle track alignment and design are contingent on the final design and location of ~~HART~~ *light metro rail* guideway columns.	Removal of on-street parking.	N/A	N/A

Table 4-24: Pedestrian Mitigations

Impacted Pedestrian Corridors (impact type)	Proposed Pedestrian Mitigation			Impact Finding With Mitigation	
	Impact Finding	Mitigation	Secondary Impact	Pedestrian Impact	Secondary Impact
All corridors (long crossing distances)	Potentially significant	Construct curb extensions at all intersections with on-street parking and that have 24' curb-to-curb walk distances of minor streets or 26' curb-to-curb walk distances of major streets; Reduce intersection skew; Tighten intersection geometry; Construct pedestrian refuge islands (Each mitigation measure requires further study)	Curb extensions may remove a small amount of on-street parking and reduce shy distance from parking and the curb face.	Less than significant with mitigation	Less than significant
All corridors (capacity issues due to change in pedestrian activity)	Potentially significant	Require redevelopment setbacks that ensure a minimum 15' pedestrian realm (sidewalk plus buffer including furniture zone and landscaping) regardless of existing pedestrian realm width. If the existing pedestrian realm is greater than 15', then there is no significant impact.	N/A	Less than significant with mitigation	Less than significant
Central Kaka`ako industrial streets	Potentially significant	Reconstruct streets as shared industrial streets while maintaining delivery and parking storage functions	Potential impact to parking supply.	Less than significant with mitigation	Less than significant
Ala Moana Boulevard (signal timing improvements)	Potentially significant	Reduce Ala Moana signal cycle lengths to 120 seconds and couple with other signal optimization features; this will create more lane capacity (from 800vph to 1200vph)	Reduces minor street signal phase by 20 seconds. Potential impact to vehicle turn storage, including deliveries.	Less than significant with mitigation	Less than significant
Ala Moana Boulevard (pedestrian improvements)	Potentially significant.	Construct makai side shared use path	Potential impact to pedestrians on makai side.	Less than significant with mitigation	Less than significant if adequate pedestrian path is maintained

Figures 48-55 in the Traffic Study presented in Appendix D of this EIS illustrate the proposed changes to streets with recommended mitigation measures for the Proposed Action. Streets with varying sidewalk widths are illustrated with ranges. All cross sections are conceptual and would require further engineering study prior to implementation.

4.8 Noise

An acoustic impact study was conducted for the Proposed Action by Y. Ebisu & Associates and is presented in Appendix E of this EIS. Following is a summary of its findings.

4.8.1 Methodology

The noise descriptor currently used by federal agencies (such as FHA/HUD) to assess environmental noise is the *Day-Night Average Sound Level* (Ldn or DNL). This descriptor incorporates a 24-hour average of instantaneous A-Weighted sound levels as read on a standard Sound Level Meter. Table 1 in the Noise Study (see Appendix E) presents current federal noise standards and acceptability criteria for residential land uses. As a general rule, noise levels of 55 DNL or less occur in rural areas, or in areas removed from high volume roadways. In urbanized areas that are shielded from high volume streets (central Manoa Valley, for example), DNL levels generally range from 55 to 65 DNL and are usually controlled by motor vehicle traffic noise. Residences that front major roadways are generally exposed to levels of 65 DNL, and as high as 75 DNL when the roadway is a high-speed freeway.

For purposes of determining noise acceptability for funding assistance from federal agencies (FHA/HUD and VA), an exterior noise level of 65 DNL or less is considered acceptable for noise sensitive properties. This standard is applied nationally including Hawaii. For commercial, industrial, and other non-noise sensitive land uses, exterior noise levels as high as 75 DNL are generally considered acceptable.

On the Island of O`ahu, the State Department of Health (DOH) regulates noise from construction activities through the issuance of permits for allowing excessive noise during limited time periods. State DOH noise regulations are expressed in maximum allowable property line noise limits rather than DNL. State DOH noise limits for residential, commercial, and industrial lands equate to approximately 55 DNL, 60 DNL, and 76 DNL, respectively.

The HCDA has established property line noise limits for the KCDD depending on the emphasis placed by its multi-use zoning districts. Although they are not direction comparable to noise criteria express in DNL, HCDA noise limits for residential, commercial, and waterfront industrial lands equate to approximately 60, 60, and 70 DNL respectively.

It should be noted that the noise compatibility guidelines and relationships to the DNL noise descriptor might not be applicable to impulsive noise sources such as pile driving. The State DOH limits for impulsive noise sources that exceed 120 impulses in any 20-minute period are 10 decibels above the limits for non-impulsive sounds. If impulsive sounds do not exceed 120 impulses in any 20-minute time period, there are no regulatory limits on their sound levels under the State DOH regulations.

Existing traffic noise levels were measured at twelve locations (A through L in Figure 4-23) in the project area to provide a basis for developing the Proposed Action's traffic noise contributions along the roadways that will service the KCDD. Traffic noise measurements were taken during late 2012 and early 2013. The results of the traffic noise measurements were then compared with calculations of existing traffic noise levels to validate the computer model used. Traffic noise calculations were developed for both the existing and future conditions in the KCDD for ground level and elevated receptors, and for traffic conditions with and without the Proposed Action. The anticipated noise levels from the planned elevated rail system were included in the forecasts of future noise levels in the KCDD with and without the Proposed Action. Calculations of average exterior and interior noise levels from construction activities were performed for typical naturally ventilated and air-conditioned dwellings. Predicted noise levels were compared with existing background ambient noise levels, and the potential for noise impacts was assessed. Potential noise and vibration impacts from pile driving operations were also addressed.

4.8.2 Existing Conditions

The existing background ambient noise levels within the KCDD are dependent upon receptor location relative to the high volume roadways, receptor elevation, and spatial relationships to fixed noise sources in the vicinity of the receptor. Residual background noise levels due to traffic noise may be higher at the higher elevations of residential towers than at ground level.

In the KCDD, traffic noise levels associated with Nimitz Highway, Ala Moana Boulevard, Kapiolani Boulevard, King Street, Ward Avenue, Piikoi Street, Punchbowl Street, Pensacola Street, South Street and Cooke Street, are typically greater than 65 DNL along their rights-of-way due to the large volumes of traffic on those major thoroughfares. Figure 4-24 depicts crosshatched areas where traffic noise levels generally exceed 65 DNL, and are considered to be "Significant Exposure – Normally Unacceptable" (SE-NU). However, actual traffic noise levels within the crosshatched regions could be less than 65 DNL if the receptor is shielded from the traffic lanes by intervening buildings or walls. They could also be higher if the receptor location is exposed to traffic noise from more than one major thoroughfare. The study of existing conditions determined:

- The Aloha Tower Special District (ATSD) is essentially all within the SE-NU noise exposure zone due to traffic noise from Nimitz Highway.
- The Makai Area's SE-NU noise exposure zone is located along its mauka boundary, and controlled by traffic on Ala Moana Boulevard.
- The Civic Center Neighborhood's SE-NU noise exposure zones are located along its district boundaries at King, South, and Punchbowl Streets.
- The Pauahi Neighborhood's SE-NU noise exposure zones are located along its district boundaries at Ala Moana Boulevard and Ward Avenue, and to a lesser extent at Punchbowl, Cooke, and Coral Streets. A relatively large portion of the district is not within the 65 DNL noise exposure zone.

Figure 4-23: Noise Measurement Locations

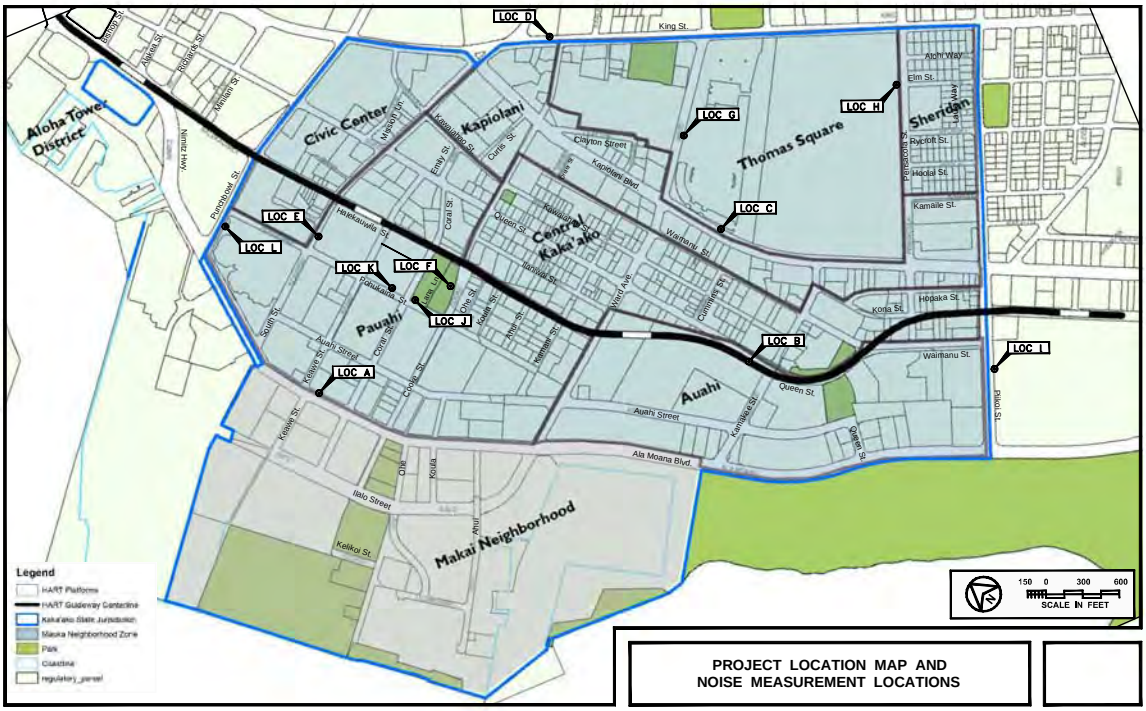


Figure 4-24: Existing Traffic Noise Exposure

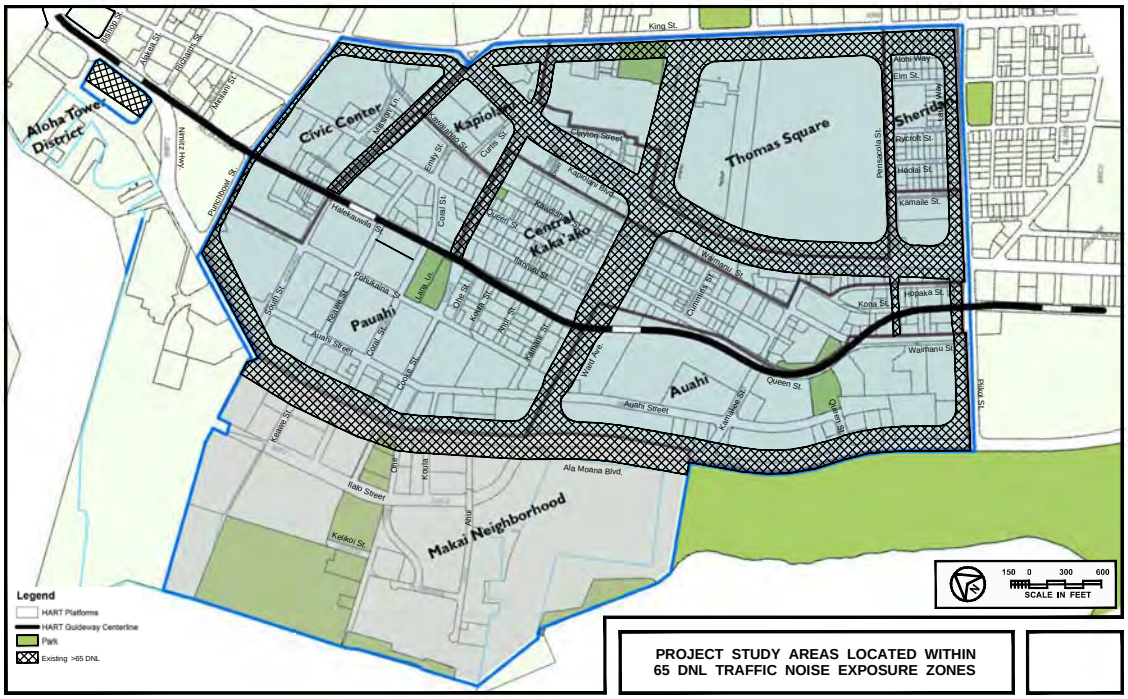
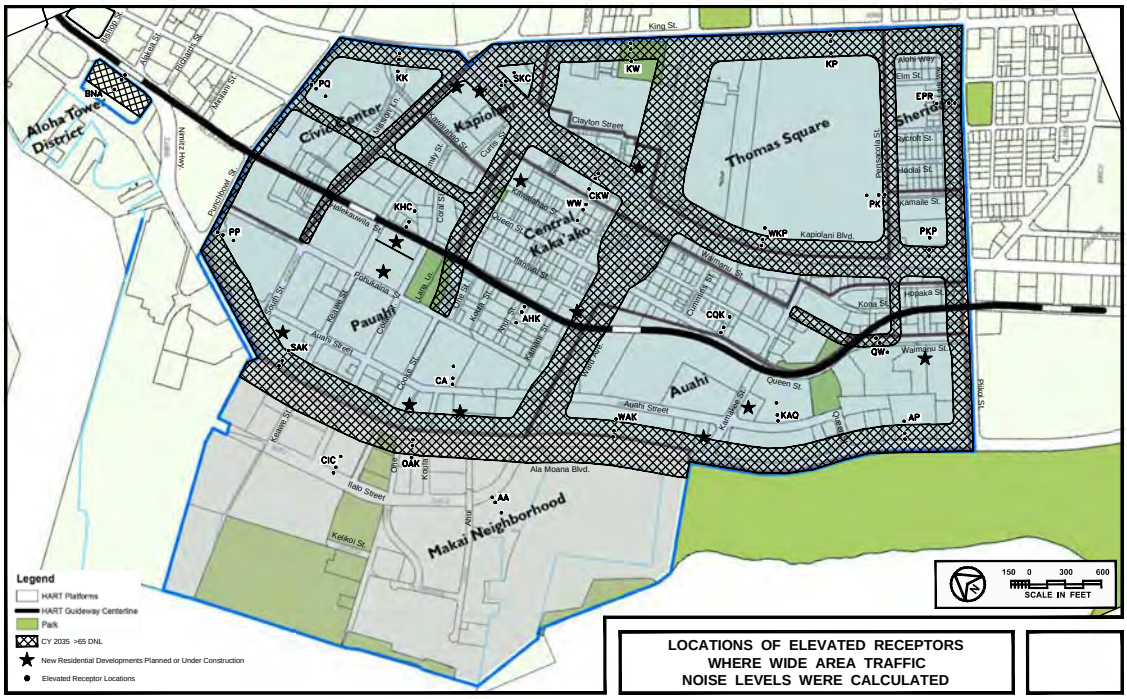


Figure 4-25: 2035 Traffic Noise Exposure



- The Kapiolani Neighborhood's SE-NU noise exposure zones represent approximately 50 percent of the total land area within its neighborhood boundaries because of its orientation alongside Kapiolani Boulevard, King Street, Ward Avenue, Pensacola Street, and Piikoi Street.
- The Thomas Square Neighborhood's SE-NU noise exposure zones are located along King, Pensacola, and Cooke Streets, and along Ward Avenue and Kapiolani Boulevard.
- The Central Kaka`ako Neighborhood's SE-NU noise exposure zones are located along Ward Avenue and Cooke, Pensacola, and Piikoi Streets.
- The Sheridan Neighborhood's SE-NU noise exposure zones are located along King, Pensacola, and Piikoi Streets.
- The Auahi Neighborhood's SE-NU noise exposure zones are located along Ala Moana Boulevard, Ward Avenue, and Piikoi Street.

4.8.3. Potential Impacts and Recommended Measures to Mitigate Them

4.8.3.1 Traffic and Rail Noise

Under full development of the worst-case scenario under the Proposed Action in 2035, essentially no significant increases in traffic noise levels are expected, except for the section of Kamakee Street between Ala Moana Boulevard and Auahi Street. Baseline traffic noise level increases not attributable to the Proposed Action are typically higher than those attributable to the Proposed Action. Figure 4-25 depicts SE-NU noise exposure zones in 2035. When compared to those depicted in the previous figure illustrating the existing condition, it can be see that some of the SE-NU areas have increased in size. However, the noise study concludes that those increases are largely due to increases in Baseline Condition traffic (without the Proposed Action), except for the aforementioned section of Kamakee Street between Ala Moana Boulevard and Auahi Street.

Figure 4-25 also includes locations of ground and high-rise receptors where existing and future noise levels were calculated. At each labeled receptor, multiple receptor locations (indicated by three black dots) at 50, 100, and 200-foot ground level setback distance from the roadway centerline were calculated, together with 50, 100, 150, 200, and 300-foot elevations. The results of the analysis indicate very small changes in 2035 traffic noise levels associated with the worst-case scenario under the Proposed Action.

The rail system is expected to cross through the Mauka Area. The elevated guideway is expected to range from approximately 29 to 42 feet above ground level, be of concrete construction, have 3-foot high sidewalls for noise mitigation, and include noise-skirts for transit vehicles. Based on data presented in the Elevated Fixed Guideway (Rail) Transit System 2008 EIS, the predicted noise levels for 2030 are summarized below:

- At 700 Richards Street, rail noise levels were predicted to range from 67 DNL to 62 DNL or less without sound walls or wheel skirts. With "current design",

predicted rail noise levels ranged from 65 to 62 DNL. The use of 3-foot high sidewalls did not seem to be included in the "current design".

- At 610 Cooke Street, rail noise levels were predicted to range from 71 DNL to 72 DNL without sound walls or wheel skirts. With "current design", predicted rail noise levels ranged from 56 to 62 DNL. The use of 3-foot high sidewalls seemed to be included in the "current design".
- At Mother Waldron Neighborhood Park, rail noise levels were predicted to be 62 DNL without sound walls or wheel skirts. With "current design", predicted rail noise levels of 47 DNL. The use of 3-foot high sidewalls seemed to be included in the "current design". The specific location of the receptor within the park was not indicated, but was estimated to be approximately 200 feet from the vertical plane through the rail centerline.
- At 860 Halekauwila Street, rail noise levels were predicted to range from 72 DNL to 62 DNL or less without sound walls or wheel skirts. With "current design", predicted rail noise levels ranged from 57 to 61 DNL or less. The use of 3-foot high sidewalls seemed to be included in the "current design".
- At Uraku Tower on the makai side of Kapiolani Boulevard, just east of Piikoi Street, rail noise levels were predicted to range from 63 DNL to 61 DNL or less without sound walls or wheel skirts. With "current design", predicted rail noise levels ranged from 61 to 60 DNL or less. The use of 3-foot high sidewalls did not seem to be included in the "current design".

The results of the ~~HART~~ ***light metro*** rail system noise analysis indicates that a buffer distance of approximately 192 feet will be required in order to minimize the influence of the rail transit system noise contributions or exceedances of the 65 DNL federal noise standard due to the combined contributions from both rail and motor vehicle noise. At dwelling units located within 120 feet of the guideway system centerline, the rail transit system can be the dominant noise source if mitigation measures are not incorporated into the rail transit system design. Without mitigation measures, the rail transit system noise levels are expected to be similar to those along King Street or Ala Moana Boulevard in 2035 under the worst-case scenario of the Proposed Action.

As specified in the Honolulu High-Capacity Transit Corridor Project Final EIS, noise mitigation for the Honolulu Rapid Transit Project includes 3-foot high parapet walls, which are known as sound barriers, along the guideway, wheel skirts, and sound absorptive materials under the track along the following properties in the KCDD: 860 Halekauwila Street and 1133 Waimanu Street.

For the elevated receptor locations shown in Figure 4-23 that are closest to the elevated rail corridor, the noise from the rail transit system could make significant contributions to the future total noise levels, e.g. locations BNA, KHC, AHK, CQK, and QW. These five locations are all adjacent to the rail corridor. At locations further from the rail corridor (approximately 250 feet), the noise from the rail system should not make significant contributions to the future total noise levels.

Noise mitigation measures for residential units located in areas with exterior noise levels that exceed 65 DNL will typically involve the use of closure and air conditioning. The use of sound attenuating walls or barriers will be of limited effectiveness, particularly where mid-rise and high-rise developments are involved. It should be noted that the erection of mid- and high-rise buildings adjacent to roadways of the elevated rail corridor will serve as partial sound barriers to properties located behind these buildings and further away from the noise source. However, as the density of these mid- and high-rise structures increase along a transportation corridor, their reflective surfaces will tend to increase the background noise levels along the transportation corridor. The use of closure and air conditioning will probably be the only available noise mitigation measure for noise sensitive developments located within the high noise zones.

4.8.3.2 Construction Noise

Audible construction noise will probably be unavoidable during build out of the Proposed Action. However, the actual length of exposure to construction noise at any receptor location will probably be less the total construction period for the entire Proposed Action. Direct line of sight distances from construction equipment to existing and future residential and commercial buildings will probably range from 20 feet to 1,300 feet, with corresponding average noise levels of 95 to 55 decibel averages (plus or minus 5 dBA).

Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for regulation of construction noise. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the construction site. Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources and due to the exterior nature of the work. The use of properly muffled construction equipment should be required on all job sites.

Peak airborne noise levels from pile driving may be as much as 15 dBA greater than noise levels for non-impulsive (steady) construction noise sources. Although the pile driving can produce more intense noise levels, each pulse is of short individual duration (less than 1 second). Therefore, its impact on speech communication is not as severe as that of a steady source of the same noise level.

Severe noise impacts are not expected to occur inside air-conditioned structures that are with 50-450 feet of a construction site. Inside naturally ventilated structures, interior noise levels (with windows and doors open) are estimate to range between 55 to 76 dBA at 50-450 feet or more from the construction site. Closure of all doors and windows facing the construction site would generally reduce interior noise levels by an additional 5-10 dBA.

The incorporation of State of Hawaii DOH construction noise limits and curfew times, which are applicable throughout the state, is another noise mitigation measure that is normally applied to construction activities. Noisy activities are generally not allowed on

Sundays and holidays, during the early morning, and during the late evening and nighttime periods under DOH permit procedures.

Pile driving may be necessary to implant piles into the ground at some construction sites. Impact driven concrete or sheet piles may both be used. Induced ground vibrations from the pile driving operations have the potential to cause architectural and structure damage to nearby structures. The following proscriptive measures are recommended for implementation during the planning and design phases of development for individual projects that together constitute either alternative of the Proposed Action:

- In addition to the normal planning and design concerns regarding potential damage due to settling and heaving during construction, consideration should be given to risks of damage due to vibration from pile driving. Damage criteria of 0.2 inches/second[9] should be used in conjunction with vibration prediction methods to identify the potential source of damage risk distances to the driven piles.
- If predicted vibration levels from pile driving exceed 0.2 inches/second at a building and predicted vibration levels cannot be reduced by adjusting the size of the pile driver, test piles should be driven and their vibrations monitored and recorded prior to completion of the foundation design. The monitoring of the test piles should be designed to measure the expected peak, 3-axis vibration levels at the building. The results of the monitoring should be used to define the empirical distance from the drive pile to the 0.2 inches/second damage risk location, and to evaluate the risks of structural damage to the adjacent structure during actual construction.
- If predicted vibration levels from pile driving exceed 2.0 inches/second at a building, the use of alternative types of piles or shoring should be considered for implementation during the design phase.

4.9 Air Quality

An Air Quality Impact Study was conducted for the worst-case scenario under the Proposed Action by B. D. Neal & Associates and is presented in Appendix F. A summary of the report's findings is presented below.

4.9.1 Air Quality Standards

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter

[9] Ground vibrations generated during pile driving are generally described in terms of peak particle (or ground) velocity in units of inches/second. The most commonly used damage criteria for structures is 2.0 inches/second derived from work by the U.S. Bureau of Mines. A more conservative limit of 0.2 inches/second is also used, and is suggested for planning purposes on this project because of the repetitive nature of pile driving operations, which can increase risks of damage due to fatiguing.

11-59 of the Hawaii Administrative Rules. Table 4-25 summarizes both the national and the state AAQS that are specified in the cited documents. As indicated in the table, national and state AAQS have been established for particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. The state has also set a standard for hydrogen sulfide. National AAQS are stated in terms of both primary and secondary standards for most of the regulated air pollutants. National primary standards are designed to protect the public health with an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

Each of the regulated air pollutants has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both national and state standards allow a specified number of times a standard can be exceeded each year.

The Hawaii AAQS are in some cases considerably more stringent than the comparable national AAQS. In particular, the Hawaii 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit.

The national AAQS are reviewed periodically, and multiple revisions have occurred over the past 30 years. In general, the national AAQS have become more stringent with the passage of time and as more information and evidence become available concerning the detrimental effects of air pollution. Changes to the Hawaii AAQS over the past several years have tended to follow revisions to the national AAQS, making several of the Hawaii AAQS the same as the national AAQS.

4.9.2 Affected Environment

Regional and local climatology significantly affects the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawaii is relatively moderate throughout most of the state, significant differences in these parameters may occur from one location to another. Most differences in regional and local climates within the state are caused by the mountainous topography.

Hawaii lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high-pressure cell to the north and east. On the island of O`ahu, the Ko`olau and Waianae Mountain Ranges are oriented almost perpendicular to the trade winds, which accounts for much of the variation in the local climatology of the island. The KCDD is locate in the leeward area of the Ko`olau Mountains.

Wind frequency data for Honolulu International Airport (HIA), which is located about 10 miles to the east of the KCDD, show that the annual prevailing wind direction for this area of O`ahu is east-northeast. On an annual basis, 34.7 percent of the time the wind is from this direction, and more than 70 percent of the time the wind is in the northeast quadrant. Winds from the south are infrequent, occurring only a few days a year and mostly in winter in association with Kona storms. Wind speeds average about 10 knots (12 mph) and most vary between 5 and 15 knots (6 and 17 mph).

Table 4-25: Summary of State of Hawai`i and National Ambient Air Quality Standards

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Particulate Matter (<10 microns)	µg/m³	Annual 24 Hours	- 150[a]	- 150[a]	50 150[b]
Particulate Matter (<2.5 microns)	µg/m³	Annual 24 Hours	15[c] 35[d]	15[c] 35[d]	- -
Sulfur Dioxide	ppm	Annual 24 Hours 3 Hours 1 Hour	- - - 0.075[e]	- - 0.5[b] -	0.03 0.14[b] 0.5[b] -
Nitrogen Dioxide	ppm	Annual 1 Hour	0.053 0.100[f]	0.053 -	0.04 -
Carbon Monoxide	ppm	8 Hours 1 Hour	9[b] 35[b]	- -	4.4[b] 9[b]
Ozone	ppm	8 Hours	0.075[g]	0.075[g]	0.08[g]
Lead	µg/m³	3 Months Quarter	0.15[h] 1.5[i]	0.15[h] 1.5[i]	- 1.5[i]
Hydrogen Sulfide	ppm	1 Hour	-	-	0.035[b]

[a] Not to be exceeded more than once per year on average over three years.

[b] Not to be exceeded more than once per year.

[c] Three-year average of the weighted annual arithmetic mean.

[d] 98th percentile value of the 24-hour concentrations averaged over three years.

[e] Three-year average of annual fourth-highest daily 1-hour maximum.

[f] 98th percentile value of the daily 1-hour maximum averaged over three years.

[g] Three-year average of annual fourth-highest daily 8-hour maximum.

[h] Rolling 3-month average.

[i] Quarterly average.

Air pollution emissions from motor vehicles, the formation of photochemical smog, and smoke plume rise all depend in part on air temperature. Colder temperatures tend to result in higher emissions of contaminants from automobiles but lower concentrations of photochemical smog and ground-level concentrations of air pollution from elevated plumes. In Hawai`i, the annual and daily variation of temperature depend to a large degree on elevation above sea level, distance inland, and exposure to the trade winds. Average temperatures at locations near sea level generally are warmer than those at higher elevations. Areas exposed to the trade winds tend to have the least temperature variation, while inland and leeward areas often have the most. Based on 25 years of data collected at Honolulu International Airport, average annual daily minimum and maximum temperatures in the project area are about 70°F and 84°F, respectively. The extreme minimum temperature on record at the airport is 54°F, and the extreme maximum temperature is 95°F.

Rainfall can have a beneficial effect on the air quality of an area because it helps to suppress fugitive dust emissions, and it also may "washout" gaseous contaminants that are water-soluble. Rainfall in Hawaii is highly variable depending on elevation and on location with respect to the trade wind. The Kaka`ako area is one of the drier areas on O`ahu due to its leeward and near sea level location. Average annual rainfall measured at nearby downtown Honolulu amounts to about 24 inches. Most of the rainfall usually occurs in the winter months. Monthly rainfall may vary from as little as a trace to more than 10 inches.

Present air quality in the project area is mostly affected by air pollutants from motor vehicles, agricultural operations and to a lesser extent by natural sources. The State Department of Health operates a network of air quality monitoring stations at various locations on O`ahu. Table 4-26 shows annual summaries of air quality measurements that were made nearest to the KCDD for several of the regulated air pollutants for the period 2007 through 2011. These are the most recent data that are currently available.

During the 2007-2011 period, sulfur dioxide was monitored by the State DOH at an air quality station located at downtown Honolulu. Concentrations monitored were consistently low compared to the standards. Annual second highest 3-hour concentrations (which are most relevant to the air quality standards) ranged from 0.008 to 0.021 parts per million (ppm), while the annual second-highest 24-hour concentrations ranged from 0.002 to 0.005 ppm. Annual average concentrations were only about 0.001 ppm. There were no exceedances of the state/national 3-hour or 24-hour AAQS for sulfur dioxide during the 5-year period. It should be noted that the national AAQS for sulfur dioxide were revised during 2010, and data pertaining to the revised standards were only reported for 2011 (and are not shown in the table).

However, based on the information available, exceedance of the new 1-hour national AAQS for sulfur dioxide within the study area is very unlikely.

Particulate matter less than 2.5 microns in diameter (PM-2.5) is also measured at the downtown Honolulu monitoring station. Annual highest 24-hour PM-2.5 concentrations ranged from 9 to 50 micrograms per cubic meter ($\mu g/m^3$) between 2007 and 2011. The highest values were generally due to either fireworks on New Year's Eve or bad vog days. Only one exceedance of the 24-hour concentration limit occurred during this five-year period and it was due to New Year's Eve fireworks. (It should be noted that the City and County of Honolulu has now banned most fireworks and on New Year's Eve, Honolulu is now relatively silent and smoke-free.) Average annual concentrations ranged from 3.9 to 4.8 $\mu g/m^3$, which were within the state and national AAQS.

Carbon monoxide measurements were obtained at the downtown Honolulu monitoring station. The annual second-highest 1-hour concentrations ranged from 1.1 to 1.8 ppm. The annual second-highest 8-hour concentrations ranged from 0.8 to 1.0 ppm. No exceedance of the state or national 1-hour or 8-hour concentrations were reported.

Nitrogen dioxide is monitored by the state DOH at the Kapolei monitoring station, which is about 16 miles west of the KCDD. Annual average concentrations of this pollutant ranged from 0.003 to 0.005 ppm, safely inside the state and national AAQS. A new 1-hour standard was implemented in 2010. Data pertaining to this new standard is not shown in the table. But based on information available, exceedance of the new 1-hour standard for nitrogen dioxide within the KCDD is very unlikely.

The nearest available ozone measurements were obtained at Sand Island (just west of the KCDD). The annual fourth-highest 8-hour concentrations (which are most relevant to the standards) for the period 2007 through 2011 ranged between 0.033 and 0.048 ppm, which is well inside the state and federal standards. The 8-hour standard for ozone did not exist prior to 2002. Prior to 2002, the now obsolete state 1-hour standard was typically exceeded several times each year.

Although not shown in the table, the nearest and most recent measurements of ambient lead concentrations that have been reported were made at the downtown Honolulu monitoring station between 1996 and 1997. Average quarterly concentrations were near or below the detection limit, and no exceedances of the state AAQS were recorded. Monitoring for this parameter was discontinued in 1997.

Based on the data and the discussion presented above, it appears likely that State of Hawai`i AAQS for sulfur dioxide, nitrogen dioxide, particulate matter, ozone and lead are currently being met in the KCDD. While carbon monoxide measurements at the downtown Honolulu monitoring station suggest that concentrations are within the state and national standards, local "hot spots" may exist near traffic-congested intersections. The potential for this within the KCDD is examined below.

Table 4-26: Annual Summaries of Air Quality Measurements for Monitoring Stations Nearest Kaka`ako

Parameter / Location	2007	2008	2009	2010	2011
Sulfur Dioxide / Downtown Honolulu					
3-Hour Averaging Period:					
Number of Samples	2827	2876	2858	2869	2757
Highest Concentration (ppm)	0.021	0.011	0.023	0.010	0.012
2nd Highest Concentration (ppm)	0.018	0.011	0.021	0.010	0.008
No. of State AAQS Exceedances	0	0	0	0	0
24-Hour Averaging Period:					
Number of Samples	359	363	360	365	354
Highest Concentration (ppm)	0.007	0.004	0.005	0.004	0.005
2nd Highest Concentration (ppm)	0.005	0.004	0.004	0.003	0.002
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration (ppm)	0.001	0.001	0.001	0.001	0.001
Particulate (PM-2.5) / Downtown Honolulu					
24-Hour Averaging Period:					
Number of Samples	115	119	305	361	347
Highest Concentration ($\mu g/m^3$)	9	34	21	50	25
98th% Concentration ($\mu g/m^3$)	8	13	13	12	9
No. of State AAQS Exceedances	0	0	0	1	0
Annual Average Concentration ($\mu g/m^3$)	3.9	4.7	4.8	4.7	4.7
Carbon Monoxide / Downtown Honolulu					
1-Hour Averaging Period:					
Number of Samples	8627	8732	8628	8699	8558
Highest Concentration (ppm)	2.0	2.1	1.6	1.8	1.4
2nd Highest Concentration (ppm)	1.6	1.8	1.6	1.5	1.1
No. of State AAQS Exceedances	0	0	0	0	0
8-Hour Averaging Period:					
Number of Samples	8635	8735	8627	8731	8629
Highest Concentration (ppm)	1.1	1.0	0.9	0.8	0.8
2nd Highest Concentration (ppm)	1.0	1.0	0.9	0.8	0.8
No. of State AAQS Exceedances	0	0	0	0	0
Nitrogen Dioxide / Kapolei					
Annual Average Concentration (ppm)	0.005	0.004	0.004	0.003	0.003
Ozone / Sand Island					
8-Hour Averaging Period:					
Number of Samples	357	305	341	8730	8392

Table 4-26 (continued)

Highest Concentration (ppm)	0.036	0.050	0.049	0.052	0.047
2nd Highest Concentration (ppm)	0.035	0.048	0.048	0.048	0.047
4th Highest Concentration (ppm)	0.033	0.043	0.048	0.047	0.046
No. of State AAQS Exceedances	0	0	0	0	0

Source: State of Hawaii Department of Health, "Annual Summaries" Hawaii Air Quality Data, 2007 - 2011

4.9.3 Potential Impacts and Recommended Measures to Mitigate Them

Implementation of the worst-case scenario under the Proposed Action could result in some short- and/or long-term impacts on air quality that may occur either directly or indirectly as a consequence of the transit-oriented development project.

Short-term impacts from fugitive dust could occur during the construction of additional residential developments. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the minor disruption of traffic, and from workers' vehicles may also affect air quality during periods of construction. State air pollution control regulations require that there be no visible fugitive dust emissions at the property line. Hence, effective dust control measures will be to be implemented by contractors to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering active work areas, using wind screens, keeping adjacent paved roads clean, and by covering open-bodied trucks. Other dust control measures include limiting the area that is to be disturbed at any given time and/or mulching inactive areas that have been worked. Exhaust emissions can be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

To assess potential long-term impact of emissions from motor vehicle traffic operating on roadways in the KCDD after implementing the Proposed Action through the year 2035, a computerized air quality modeling study was undertaken. The study estimated current worst-case concentrations of carbon monoxide at roadway intersections in the project vicinity and predicted future levels both with and without the Proposed Action. During worst-case conditions, model results indicated that present 1-hour and 8-hour worst-case carbon monoxide concentrations are well within both the state and the national ambient air quality standards. In the year 2035, with the Proposed Action, worst-case carbon monoxide concentrations were predicted to generally decrease (improve) by about 10 to 20 percent. With the Proposed Action in 2035, estimated worst-case carbon monoxide concentrations indicated only minimal or no impact compared to the Baseline Condition. Concentrations would remain within the standards. Due to the negligible impact the worst-case scenario under the Proposed Action is expected to have, implementing mitigation measures for long-term traffic-related air quality impacts is unnecessary and unwarranted.

4.10 Socio-Economic Characteristics

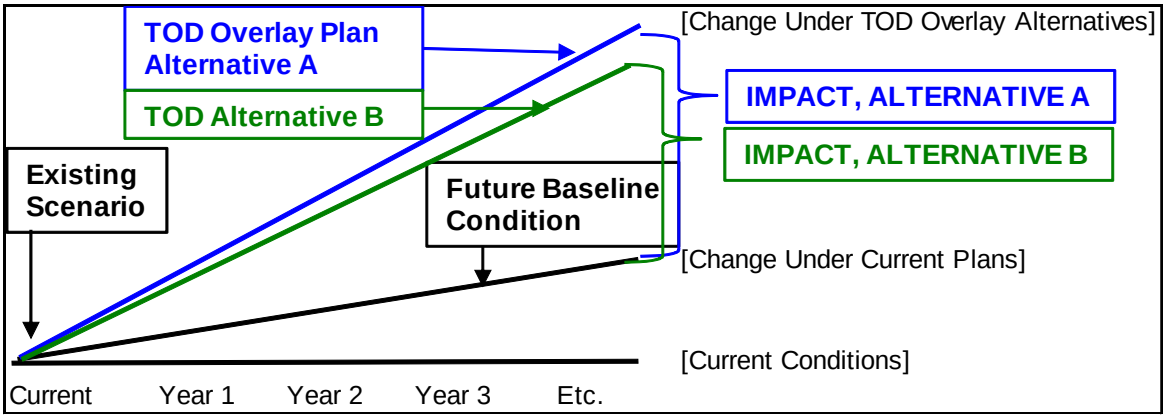
A detailed socio-economic impact analysis was prepared by J.M. Knox & Associates to address the impacts of the Future Baseline Condition and the Proposed Action. It is presented as Appendix G to this EIS. If interested in this subject matter, the reader is strongly advised to review the report's Chapter 2 in its entirety, as it presents the assumptions upon which the analysis is based and the methodology it employs. Following is a brief discussion of some of the key assumptions employed in the analysis.

For physical environmental impacts, it usually makes sense to assume that conditions without the Proposed Action would simply involve a continuation of current conditions. But for socio-economic assessment, the future without the new Plan is not what is there now; rather, it would be development under the currently approved Mauka and Makai Area Plans. Therefore, an economic "impact" is not change from present conditions, but rather the ***difference between two estimated futures*** – i.e., the difference in population, jobs, etc. between what is estimated to be possible under the TOD Overlay Plan and Rules, versus what is estimated to occur under existing Plans and Rules. Figure 4-26 shows how these scenarios relate to the concept of socio-economic "impact."

The logic thus involves three scenarios, though only two of them are directly used to calculate numerical "impacts":

1. The **Existing Scenario** represents the best estimate of current conditions. It is not directly used for impact calculations, but is important for context and for some topics is necessary to calculate the numbers used for both future scenarios (for example, new building construction cannot be estimated without knowing what is there now).
2. The **Future Baseline Scenario** is the term that will be used to describe what is estimated to happen under current Plans and Rules – i.e., without adoption and implementation of the TOD Overlay Plan.
3. The **TOD Overlay Scenario** is the term that will be used to describe what is estimated to happen under the Proposed Action (either TOD Alternative A or B).

Figure 4-26: Summary of Development Scenario Impacts



Implication of the Term "Scenario" for This Analysis: Many EIS's use the term "scenario," because exact future realities can never be definitively known in advance, and so it is necessary to develop a reasonable set of assumptions about quantitative aspects in order to do calculations. For virtually any EIS, socio-economic "scenarios" mean an imagined but reasonable single version of the many possible outcomes that could describe the points in time being compared. It is therefore a standard rule of socio-economic assessment to create scenarios that are "conservative" in the sense of being more likely to err on the side of a larger impact than a smaller impact.

For this analysis, though, the term "scenario" is particularly apt. As previously noted, the Kakaʻako situation differs greatly from situations in many EIS's. Yet another difference is that many EIS's are triggered by proposed actions that have specific characteristics at the time of the proposal but may turn out to be somewhat different. For example, a resort development that seeks overall land use approvals may be initially described as having 500 hotel units and 500 timeshare units, but due to market conditions or other factors is actually later built to have 400 hotel units and 600 timeshares – i.e., the range of realistic outcomes can vary somewhat from the specific EIS scenario.

However, in the case of Kakaʻako, the range of possible future realities is particularly great. The HCDA is a development authority, not a landowner. How landowners will actually respond to opportunities under either the current or proposed Plans/Rules will depend on many factors that simply cannot be known for sure – economic cycles, availability of capital, idiosyncratic personal or geographical factors affecting possible land consolidation, etc. It would be impossible to conduct a quantitative analysis without making the sorts of assumptions that produce a "scenario." These assumptions are greatly facilitated by HCDA datasets, described further in Chapter 2 of the Socio-Economic Impact Analysis (Appendix G) that model Kakaʻako structures on a building-by-building, block-by-block basis.

Timeframe: The "Existing" scenario will be operationalized as meaning the year 2010. The building-specific, block-specific Kakaʻako datasets described in Chapter 2 of Appendix G were completed in 2009, shortly before the 2010 Census, and little actual new developments were finished in the interim (or, for that matter, the time between 2010 and 2013, though a substantial number of new projects are now underway).

Both the "Future Baseline" and the two TOD alternatives are nominally operationalized as potential situations in the year 2035, though in reality they depict a probable build-out situation (not necessarily maximal *total* development under the respective Plans/Rules, but the maximal *likely* development according to the various HCDA consultants who primarily developed them). An important unanswered, and currently unanswerable, question is the actual timing of this build-out. The socio-economic impact analysis is conservative, in the sense of assuming maximal likely impacts, by concentrating the full range of potential development into the 2010-2035 time period. The analysis truly considers build-out of HCDA visions of Kakaʻako whenever they really occur.

Geographical Levels of Analysis within Kakaʻako: Although the methodology for the analysis in the socio-economic impact analysis involves use of building-specific and block-specific assumptions, results are presented only on a Kakaʻako-wide basis, and by large areas such as Mauka/Makai and the various Mauka "Neighborhood Zones."

Both the current Mauka and Makai Plans, as well as the TOD alternatives, provide landowners with the *opportunity* to redevelop in certain ways, but in no way *obligate* them to do so. Presenting block-specific results could be interpreted as attempting to influence landowner decisions, which would be inappropriate.

Another geographical level of analysis is the islandwide perspective, reserved for certain parts of the study, as per the following discussion.

Kaka`ako-Specific vs. Islandwide Impacts: A Kakaʻako-specific impact would be one that is confined to Kakaʻako itself (even if that impact is balanced by an accompanying reduction in some other part of the island). For example, increased residential population growth within Kakaʻako due to higher densities under the Proposed Action generally means people already on Oʻahu would live in Kakaʻako rather than somewhere else, reducing numbers elsewhere on the island. Kakaʻako-specific impacts may in fact just be due to shifts in the geographical location of economic and population activity that would be happening elsewhere anyway; they may be "impacts" within the Kakaʻako boundaries or any identifiable areas from which they attract population, but from an islandwide perspective their net impacts may be zero.

Kakaʻako-specific impacts are of particular interest to HCDA and Kakaʻako stakeholders, and so will be separately reported, labeled, and given detailed attention. Most of the report will focus on Kakaʻako-specific impacts.

An islandwide impact would involve "net new" economic activity and/or population that either (a) occurs in Kakaʻako but is for some reason not balanced by a reduction elsewhere on the island (hence is a "net" gain); or (b) occurs outside of Kakaʻako as a result (via "ripple effects" from expenditures) of net new economic activity occurring within Kakaʻako.

An example of the latter would be if the Proposed Action results in expanding Oʻahu's economic base of "export" industries (primarily tourism and visitor expenditures) that bring new money into the state. Due to multiplier or "ripple effects" of outside money coming into the Oʻahu economy, there could be additional spending, employment, and population throughout the island.

Relatively small proportions of planned future development under either the Future Baseline or the Proposed Action would generate substantial "new" money, and so ***islandwide impacts will be fairly small*** compared to Kakaʻako-specific ones. Islandwide impacts are nevertheless presented because (a) this is the proper level for assessing impacts on State and County costs and revenues; and (b) it is important to understand that Kakaʻako-specific impacts for the most part are *not* islandwide ones – e.g., additional

full-time residential population in Kakaʻako does not mean growth in the islandwide population.

Project Components Generating Islandwide Impacts: Most of the Kakaʻako-specific impacts to be described would *not* be islandwide impacts. Just as with full-time residential population, most of the changes in economic activity (e.g., levels of retail, industrial, or office space) from the Future Baseline to the Proposed Action would simply be a matter of location – they are a function of the larger islandwide economy and market forces, and hence would be located somewhere on the island with or without this project.

However, the following elements *will* be assumed to be net new islandwide impacts –

- **Hotel Construction and Operations:** The Proposed Action permits up to three new hotels in Kakaʻako, and the scenarios for analysis assume development of three likely hotel types, as per guidance from HCDA – a business hotel, a condominium-hotel, and a traditional full-service hotel for travelers desiring to stay outside Waikīkī. Operational impacts of hotels flow from new visitor population and visitor spending throughout the island, not just in Kakaʻako.

Market forces will in reality determine the actual development, nature, location, and characteristics of any Kaka'ako hotels. It could be argued that if there is a market for three more urban Honolulu hotels, they would be developed somewhere on the island with or without this project. However, there is a very longstanding convention in Hawaiʻi EIS's for assuming that, without new entitlements, market forces would be thwarted and the requested new visitor units would not be developed elsewhere on island, at least without separate permits and entitlements subject to study in other EIS's.

- **Additional Levels of, and Spending by, Part-Residents:** Part-time residents are treated as "visitors" in most economic studies because, as with hotel guests, their spending represents new money in the economy and thereby generate new jobs. Census data indicate part-time residents already own units in Kakaʻako, and so their numbers would likely increase under either the Future Baseline or the Proposed Action scenarios. The object of this analysis is to estimate the likely *increment* in their numbers, spending, and associated economic impacts from the Future Baseline to the Proposed Action.

For purposes of this analysis, economic impacts associated with *construction* of new units ultimately occupied by this increment in part-time residents will conservatively *not* be counted among the islandwide impacts. No specific new buildings are (or, under existing or proposed Rules, could be) targeted for occupancy by part-time residents alone. If the part-time residential market were for some reason not to materialize after all, the additional residential capacity provided by the Proposed Action would still be in place – but actual full build-out would just be somewhat delayed if the market consisted entirely of full-time Honolulu residents. (However, because part-time residents often spend

significant sums to prepare new units for occupancy, impacts of such estimated initial one-time expenditures *will* be counted among the construction impacts.)

4.10.1 Units

4.10.1.1 Analysis of Units

As discussed above, the Existing Condition is assumed to be 2010 and provides a baseline for understanding levels of development anticipated under each future scenario. The number of residential units, hotel units, and commercial/industrial floor area is used as the basis for determining population.

Table 4-27 provides Kakaʻako-wide results for the number of Existing Units, as well as breakdowns by general area (Mauka, Makai, Aloha Tower Special District Site) and specific Neighborhood Zones for the Mauka area. The number of residential units in the Existing dataset (8,618 units, derived primarily from HCDA datasets) is considerably higher than that reported by the U.S. Census. Please refer to Chapter 2 in Appendix G for a discussion of these differences.

Table 4-28 provides overall results for the Future Baseline Scenario. Comparison to the "Existing" figures in the foregoing table indicates the level of development for likely build-out of Kakaʻako under current Rules – substantial increases in Residential and Retail (more than 200% each), and significant increase as well in Office (about 80%) and Industrial (about 25%), though with a modest decline in Civic space (about -15%).

Parking is anticipated to involve a consolidation into Garage Parking, leaving very little Surface Parking.

Tables 4-29 and 4-30 provide overall results for TOD Alternatives B and A, respectively. The alternatives under the Proposed Action provide even more Residential development than the Future Baseline Scenario, but less for most other uses, as detailed below.

Table 4-27: Residential Unit and Land Use Square Footage – Existing Condition

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM*	Community Center*	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**8,618**	**-**	**8,528,716**	**-**	**1,937,305**	**4,889,491**	**1,801,665**	**1,464,294**	**544,838**	**43,198**	**1,370,820**	**6,440,575**
By General Area												
Mauka	8,618	-	8,528,716	-	1,934,070	4,493,436	1,663,324	1,247,390	-	-	1,370,820	5,793,690
Makai	-	-	-	-	3,235	396,055	138,341	139,304	544,838	43,198	-	646,885
Aloha Tower Special District (ATSD)	-	-	-	-	-	-	-	77,600	-	-	-	-
By Neighbor-hood Zone												
Pauahi N.Z.	1,241	-	1,222,140	-	63,090	1,621,760	506,420	416,080	-	-	559,070	633,000
Auahi N.Z.	3,002	-	3,003,930	-	-	406,440	711,560	3,540	-	-	367,070	1,624,980
Central Kaka'ako N.Z.	744	-	690,576	-	242,020	835,406	117,574	674,310	-	-	110,750	587,790
Civic Center N.Z.	185	-	184,410	-	449,980	287,110	14,320	6,650	-	-	42,540	693,670
Kapiʻolani N.Z.	2,468	-	2,446,570	-	54,480	1,241,730	234,960	30,700	-	-	287,400	1,346,980
Sheridan N.Z.	433	-	427,270	-	73,870	35,110	6,480	-	-	-	3,990	43,990
Thomas Sq. District N.Z.	545	-	553,820	-	1,050,530	65,880	72,010	116,110	-	-	-	863,280
Makai N.Z.	-	-	-	-	3,235	396,055	138,341	139,304	544,838	43,198	-	646,885
ATSD N.Z.	-	-	-	-	-	-	-	77,600	-	-	-	-

* JABSOM is the John A. Burns School of Medicine (University of Hawaiʻi), and the Community Center (Children's Discovery Center) – kept as distinct uses for purposes of traffic analysis based on this output. In some later analyses, they are collapsed into the "Civic" category.
Columns for Hotel Units and SF are inserted to maintain comparability with the later tables 3.3 and 3.4 of Appendix G, which include this information for TOD Alternatives B and A, respectively.

Table 4-28: Residential Unit and Land Use Square Footage – Future Baseline Condition

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM	Community Center	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**21,146**	**-**	**28,577,594**	**-**	**1,637,865**	**8,180,851**	**3,872,329**	**1,796,050**	**544,838**	**43,198**	**15,390**	**18,496,225**
By General Area												
Mauka	21,146	-	28,577,594	-	1,211,170	7,038,660	3,449,213	1,692,550	-	-	15,390	16,531,560
Makai	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
Aloha Tower Special District (ATSD)	-	-	-	-	-	30,000	120,000	-	-	-	-	204,000
By Neighborhood Zone												
Pauahi N.Z.	6,086	-	9,000,867	-	947	2,298,229	980,802	486,277	-	-	-	4,889,420
Auahi N.Z.	5,709	-	7,509,664	-	-	854,984	963,961	294,766	-	-	-	3,587,005
Central Kaka'ako N.Z.	1,937	-	2,687,136	-	234,741	972,069	173,887	833,138	-	-	-	1,727,148
Civic Center N.Z.	688	-	1,038,377	-	405,526	118,792	134,797	6,650	-	-	15,390	782,354
Kapiʻolani N.Z.	4,176	-	4,415,873	-	54,500	1,166,257	530,983	71,720	-	-	-	2,774,331
Sheridan N.Z.	436	-	724,495	-	73,871	39,561	10,078	-	-	-	-	175,257
Thomas Sq. District N.Z.	2,114	-	3,201,183	-	441,585	1,588,768	654,705	-	-	-	-	2,596,045
Makai N.Z.	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
ATSD N.Z.	-	-	-	-	-	30,000	120,000	-	-	-	-	204,000

Table 4-29: Residential Unit and Land Use Square Footage – TOD Alternative B

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM	Community Center	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**26,588**	**1,044**	**37,639,258**	**547,949**	**1,766,348**	**6,484,283**	**3,369,026**	**1,709,565**	**544,838**	**43,198**	**15,390**	**20,064,395**
By General Area												
Mauka	26,386	672	37,302,490	372,949	1,339,653	5,091,292	3,004,270	1,606,065	-	-	15,390	17,743,460
Makai	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
Aloha Tower Special District (ATSD)	202	372	336,768	175,000	-	280,800	61,640	-	-	-	-	560,270
By Neighborhood Zone												
Pauahi N.Z.	8,470	-	12,828,493	-	947	1,902,790	997,811	552,245	-	-	-	5,685,348
Auahi N.Z.	5,871	317	7,778,799	168,949	-	854,984	963,961	294,766	-	-	-	3,636,478
Central Kaka'ako N.Z.	2,685	-	3,932,045	-	234,741	638,184	185,092	680,684	-	-	-	2,222,927
Civic Center N.Z.	688	-	1,038,377	-	405,526	118,792	134,797	6,650	-	-	15,390	782,354
Kapi'olani N.Z.	5,067	-	5,899,538	-	41,898	1,209,260	352,932	71,720	-	-	-	3,043,004
Sheridan N.Z.	436	-	724,495	-	73,871	39,561	10,078	-	-	-	-	175,257
Thomas Sq. District N.Z.	3,170	356	5,100,744	204,000	582,670	327,721	359,598	-	-	-	-	2,198,092
Makai N.Z.	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
ATSD N.Z.	202	372	336,768	175,000	-	280,800	61,640	-	-	-	-	560,270

Table 4-30: Residential Unit and Land Use Square Footage – TOD Alternative A

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM	Community Center	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**28,968**	**1,000**	**41,093,384**	**482,735**	**1,766,348**	**6,687,334**	**3,635,706**	**1,730,780**	**544,838**	**43,198**	**15,390**	**20,916,071**
By General Area												
Mauka	28,765	628	40,756,616	307,735	1,339,653	5,294,343	3,270,950	1,627,280	-	-	15,390	18,595,136
Makai	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
Aloha Tower Special District (ATSD)	202	372	336,768	175,000	-	280,800	61,640	-	-	-	-	560,270
By Neighborhood Zone												
Pauahi N.Z.	9,218	-	13,702,995	-	947	2,112,188	1,145,280	573,460	-	-	-	6,050,432
Auahi N.Z.	7,094	195	9,815,417	103,735	-	854,984	963,961	294,766	-	-	-	4,010,858
Central Kaka'ako N.Z.	2,685	-	3,932,045	-	234,741	638,184	185,092	680,684	-	-	-	2,222,927
Civic Center N.Z.	688	-	1,038,377	-	405,526	118,792	134,797	6,650	-	-	15,390	782,354
Kapiʻolani N.Z.	5,067	-	5,899,538	-	41,898	1,209,260	352,932	71,720	-	-	-	3,043,004
Sheridan N.Z.	436	-	724,495	-	73,871	39,561	10,078	-	-	-	-	175,257
Thomas Sq. District N.Z.	3,578	434	5,643,749	204,000	582,670	321,374	478,810	-	-	-	-	2,310,304
Makai N.Z.	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
ATSD N.Z.	202	372	336,768	175,000	-	280,800	61,640	-	-	-	-	560,270

4.10.1.2 Potential Impacts

Impacts are defined as the difference between the respective TOD Alternatives figures and the Future Baseline figures (TOD Alternative B minus Future Baseline and TOD Alternative A minus Future Baseline). Table 4-31 And 4-32 provide these results.

With regard to overall development on a Kakaʻako-wide basis, the TOD Alternatives would generate these impacts:

- At build-out, ***substantial increases in Residential square footage and units*** (for Alternative B, 26% more units and 32% more square footage than under the Future Baseline – and for Alternative A, 37% and 44% more). There would also be increases over the Future Baseline for Garage Parking space (9% for Alternative B, 13% for Alternative A), and for Civic (about 8% for each). And of course there would be limited new Hotel development under each of the TOD Alternatives.

- However, the TOD Alternatives both result in ***reduction in Office, Retail, and Industrial space*** compared to build-out for the Future Baseline Condition. The Office and Industrial reductions are roughly -20% and -4% for each TOD Alternative. The build-out scenario generated for Alternative B resulted in a somewhat greater drop in eventual Retail square footage for Alternative B (-13%) than for Alternative A (-6%). (Note that these negative percentages involve comparison to the Future Baseline figures, not to the Existing figures. Development of all these land uses is still foreseen as significant additions to the current inventory of Office, Retail, and Industrial activities, just not to the same extent as under the Future Baseline Condition.)

- Particularly in regard to Residential increases for the higher-density TOD Alternative A, the Neighborhood Zones with the greatest changes in absolute numbers of additional total units would be, starting with the most heavily affected: Pauahi, Thomas Square District, Auahi, Kapiʻolani, and Central Kakaʻako. The order is similar for the lower-density TOD Alternative B scenario, except that the Auahi Neighborhood Zone in this scenario would have much less (but still some) additional Residential-unit development.

- Unaffected by either TOD Alternative would be the limited Residential development projected under the Future Baseline Condition for the Civic Center Neighborhood Zone, the Sheridan Neighborhood Zone, and still zero Residential development for all of Makai (exclusive of the Aloha Tower Site, which is seen as shifting to a Residential and additional Retail emphasis).

Table 4-31: Residential and Land Use Square Footage – TOD Alternative B Impacts *(Alternative B Results Minus Future Baseline Results)*

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM	Community Center	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**5,443**	**1,044**	**9,061,664**	**547,949**	**128,483**	**(1,696,568)**	**(503,304)**	**(86,485)**	**-**	**-**	**-**	**1,568,171**
% Increase, TOD Alternative B over Future Baseline	25.7%	N/A	31.7%	N/A	7.8%	(20.7%)	(13.0%)	(4.8%)	0.0%	0.0%	0.0%	8.5%
By General Area												
Mauka	5,240	672	8,724,896	372,949	128,483	(1,947,368)	(444,944)	(86,485)	-	-	-	1,211,901
Makai	-	-	-	-	-	-	-	-	-	-	-	-
Aloha Tower Special District (ATSD)	202	372	336,768	175,000	-	250,800	(58,360)	-	-	-	-	356,270
By Neighborhood Zone												
Pauahi N.Z.	2,384	-	3,827,627	-	-	(395,439)	17,009	65,969	-	-	-	795,928
Auahi N.Z.	162	317	269,135	168,949	-	-	-	-	-	-	-	49,473
Central Kaka'ako N.Z.	748	-	1,244,909	-	-	(333,885)	11,205	(152,454)	-	-	-	495,779
Civic Center N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
Kapi'olani N.Z.	891	-	1,483,665	-	(12,602)	43,003	(178,051)	-	-	-	-	268,673
Sheridan N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
Thomas Sq. District N.Z.	1,055	356	1,899,561	204,000	141,085	(1,261,047)	(295,107)	-	-	-	-	(397,953)
Makai N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
ATSD N.Z.	202	372	336,768	175,000	-	250,800	(58,360)	-	-	-	-	356,270

Note: Figures in parentheses are negatives.

Table 4-32: Residential Unit and Land Use Square Footage – TOD Alternative A Impacts *(Alternative A Results Minus Future Baseline Results)*

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM	Community Center	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**7,822**	**1,000**	**12,515,790**	**482,735**	**128,483**	**(1,493,517)**	**(236,623)**	**(65,270)**	**-**	**-**	**-**	**2,419,846**
% Increase, TOD Alternative A over Future Baseline	37.0 %	N/A	43.8%	N/A	7.8%	(18.3%)	(6.1%)	(3.6%)	0.0%	0.0%	0.0%	13.1%
By General Area												
Mauka	7,620	628	12,179,022	307,735	128,483	(1,744,317)	(178,263)	(65,270)	-	-	-	2,063,576
Makai	-	-	-	-	-	-	-	-	-	-	-	-
Aloha Tower Special District (ATSD)	202	372	336,768	175,000	-	250,800	(58,360)	-	-	-	-	356,270
By Neighborhood Zone												
Pauahi N.Z.	3,132	-	4,702,129	-	-	(186,041)	164,478	87,184	-	-	-	1,161,012
Auahi N.Z.	1,385	195	2,305,753	103,735	-	-	-	-	-	-	-	423,853
Central Kaka'ako N.Z.	748	-	1,244,909	-	-	(333,885)	11,205	(152,454)	-	-	-	495,779
Civic Center N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
Kapi'olani N.Z.	891	-	1,483,665	-	(12,602)	43,003	(178,051)	-	-	-	-	268,673
Sheridan N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
Thomas Sq. District N.Z.	1,464	434	2,442,566	204,000	141,085	(1,267,394)	(175,895)	-	-	-	-	(285,741)
Makai N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
ATSD N.Z.	202	372	336,768	175,000	-	250,800	(58,360)	-	-	-	-	356,270

Note: Figures in parentheses are negatives.

4.10.2 Population

4.10.2.1 Results of Analysis

This section reports on results for several types of Kakaʻako-specific[10] populations –

- Full-time residential population; and
- "De facto" population – the number of residents or visitors actually present on an average day[11] – which has three components:
    - Full-time residents actually present (excluding people temporarily away);
    - Average part-time resident population;
    - Average visitor population in three presumed hotels.

Methods used to determine the following results are described in detail in Section 2-2 of Appendix G. It should be understood that the Future Baseline and TOD Alternative's population figures are order-of-magnitude estimates for a full build-out under each scenario, whether that actually occur in the year 2035 or sometime thereafter. Actual population will vary according to specific developer plans, and these numbers should be viewed as approximate maximal numbers.

Existing Conditions: As with estimated land use and unit counts, these "Existing" results ultimately do not affect the impact assessment – which is based on a comparison of Future Baseline and TOD Alternative results – but provide a baseline for understanding levels of development anticipated under each future scenario.

Table 4-33 provides Kakaʻako-wide results, as well as breakdowns by general area (Mauka, Makai, Aloha Tower Special District Site) and specific Neighborhoods for the Mauka area. As was discussed in Section 4.10.1.1, the HCDA data is considerably higher than that reported by the U.S. Census. Therefore, this table's estimated "existing" full-time resident population of 13,549 – based primarily on HCDA unit counts – is also higher than the 2010 Census figure (10,673).

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10 As noted in the Socio-Economic Impact Analysis, Chapter 1, Section 1.6, islandwide population impacts are conceptually different.

11 A different interpretation of "de facto population" might include workers and retail/restaurant customers present at any particular point in time. Estimating customer counts exceeds the scope of this study. The following section on employment looks at total jobcounts, but not necessarily the number present at particular points in time. Caution should be taken in simply adding population and jobcount numbers, due to factors such as employee absences and the possibility that some Kakaʻako workers are also Kakaʻako residents.

Table 4-33: Estimated Population – Existing Scenario

	Total Full-Time Residential Population	Total De Facto Population	*De Facto Resident Population*	*De Facto Part-Time Resident Population*	*De Facto Visitor Population*
KAKA'AKO TOTAL	**13,549**	**13,824**	***12,804***	***1,020***	**-**
By General Area					
Mauka	13,326	13,613	*12,593*	*1,020*	-
Makai	223	211	*211*	-	-
ATSD (Aloha Tower Special District)	-	-	-	-	-
By Neighborhood Zone					
Pauahi N.Z.	1,912	1,865	*1,807*	*58*	-
Auahi N.Z.	3,796	4,364	*3,587*	*777*	-
Central Kaka'ako N.Z.	1,522	1,464	*1,438*	*25*	-
Civic Center N.Z.	209	197	*197*	*0*	-
Kapi'olani N.Z.	4,206	4,112	*3,975*	*137*	-
Sheridan N.Z.	863	819	*816*	*3*	-
Thomas Sq. Dist. N.Z.	818	793	*773*	*20*	-
Makai N.Z.	223	211	*211*	-	-
ATSD N.Z.	-	-	-	-	-

Notes: The Makai population, taken from the 2010 Census, consists solely of the non-residential Kewalo Basin population, who may have been transients or passenger/crew of cruising vessels temporarily in port. However, this number is assumed to hold constant in all three scenarios. This was the only population number taken directly from the U.S. Census, though the Census data were used to estimate things such as average household size for various building types and places within Kaka'ako, which were then applied to unit numbers in Appendix G, Table 3.1, in order to estimate the population figures above.

The Aloha Tower Special District site currently consists of a HECO power generation facility with no residential population of any type.

A column for "De Facto Visitor Population" (hotel guests) is inserted to maintain comparability with the later table addressing the Proposed Action, which includes this information.

Future Baseline Condition: Table 4-34 below shows population results for the Future Baseline Scenario. Comparison to the comparable "Existing" figures in the foregoing table indicates both full-time and de facto populations would more than double (to about 33,500 for full-time, a bit more for de-facto), consistent with the increased number of units estimated in Section 4.10.1.1. This projected population increase flows directly from increase in units under current Rules. Consistent with the geographical distribution of

Residential units discussed, the numbers in the table below indicate that theoretical full-time population for build-out of the Future Baseline Condition would be primarily concentrated in the Pauahi Neighborhood Zone (31%), as well as the Auahi (22%) and Kapiʻolani (21%) zones.

Table 4-34: Estimated Population – Future Baseline Scenario

	Total Full-Time Residential Population	Total De Facto Population	*De Facto Resident Population*	*De Facto Part-Time Resident Population*	*De Facto Visitor Population*
KAKAʻAKO TOTAL	**33,466**	**33,844**	***31,626***	***2,218***	**-**
By General Area					
Mauka	33,243	33,633	*31,415*	*2,218*	-
Makai	223	211	*211*	-	-
ATSD (Aloha Tower Special District)	-	-	-	-	-
By Neighborhood Zone					
Pauahi N.Z.	10,341	10,131	*9,772*	*358*	-
Auahi N.Z.	7,386	8,429	*6,980*	*1,450*	-
Central Kaka'ako N.Z.	3,354	3,258	*3,169*	*88*	-
Civic Center N.Z.	826	788	*780*	*8*	-
Kapiʻolani N.Z.	7,097	6,944	*6,707*	*237*	-
Sheridan N.Z.	824	783	*778*	*4*	-
Thomas Sq. Dist. N.Z.	3,416	3,301	*3,228*	*73*	-
Makai N.Z.	223	211	*211*	-	-
ATSD N.Z.	-	-	-	-	-

Table Notes: All indicated population is associated with residential housing structures, except for the assumed continuation of Kewalo Basin non-residential population in the Makai area.

No "De Facto Visitor Population" is shown because no short-term transient accommodations (e.g., hotels) are permitted in Kakaʻako under the present Rules.

The Aloha Tower Special District site is assumed under this scenario to be developed as a retail and office complex, with no residential component.

TOD Alternatives: Consistent with the increased Residential space discussed previously, ***both TOD Alternatives result in more population at build-out than under the Future Baseline Condition.***

Overall results are presented in Table 4-35 (TOD Alternative B) and Table 4-36 (Alternative A). For Alternative B, full-time residential and overall de facto populations are estimated at about 42,500 and 44,500 respectively. The higher-density Alternative A, the build-out numbers increase to about 46,200 and 48,200 respectively.

An average daily visitor population of roughly 1,700 people in each scenario would be spread among three assumed hotels (and thus represents just a small part of the estimated overall de facto populations).

Table 4-35: Estimated Population – TOD Alternative B

	Total Full-Time Residential Population	Total De Facto Population	*De Facto Resident Population*	*De Facto Part-Time Resident Population*	*De Facto Visitor Population*
KAKA'AKO TOTAL	**42,477**	**44,465**	***40,141***	***2,573***	***1,752***
By General Area					
Mauka	41,986	43,482	*39,676*	*2,522*	*1,283*
Makai	223	211	*211*	-	-
ATSD (Aloha Tower Special District)	268	772	*254*	*50*	*469*
By Neighborhood Zone					
Pauahi N.Z.	14,493	14,175	*13,696*	*480*	-
Auahi N.Z.	7,600	9,270	*7,182*	*1,490*	*598*
Central Kaka'ako N.Z.	4,562	4,452	*4,311*	*141*	-
Civic Center N.Z.	826	788	*780*	*8*	-
Kapi'olani N.Z.	8,664	8,476	*8,188*	*288*	-
Sheridan N.Z.	824	783	*778*	*4*	-
Thomas Sq. Dist. N.Z.	5,017	5,537	*4,741*	*111*	*685*
Makai N.Z.	223	211	*211*	-	-
ATSD N.Z.	268	772	*254*	*50*	*469*

Notes: All indicated population is associated with residential housing or transient accommodation structures, except for the assumed continuation of Kewalo Basin non-residential population in the Makai area. The Aloha Tower Special District site is assumed under this scenario (and under TOD Alternative A) to be even more intensively developed as a retail and office complex, but this time with a substantial residential component.

Compared to the percentages for the Future Baseline Condition noted above, the *proportionate* geographical distribution of full-time residential population would again change only slightly, with a few more percentage points in the Pauahi Neighborhood Zone (about 34% for each TOD Alternative) and a few less in the Auahi (18% for TOD Alternative B and 20% for Alternative B) and Kapiʻolani (20% for Alternative B and 19% for Alternative A) zones.

Table 4-36: Estimated Population – TOD Alternative A

	Total Full-Time Residential Population	Total De Facto Population	*De Facto Resident Population*	*De Facto Part-Time Resident Population*	*De Facto Visitor Population*
KAKAʻAKO TOTAL	**46,181**	**48,223**	***43,641***	***2,911***	***1,671***
By General Area					
Mauka	45,690	47,240	*43,177*	*2,861*	*1,202*
Makai	223	211	*211*	-	-
ATSD (Aloha Tower Special District)	268	772	*254*	*50*	*469*
By Neighborhood Zone					
Pauahi N.Z.	15,857	15,486	*14,985*	*501*	-
Auahi N.Z.	9,223	10,877	*8,715*	*1,794*	*367*
Central Kaka'ako N.Z.	4,562	4,452	*4,311*	*141*	-
Civic Center N.Z.	826	788	*780*	*8*	-
Kapiʻolani N.Z.	8,664	8,476	*8,188*	*288*	-
Sheridan N.Z.	824	783	*778*	*4*	-
Thomas Sq. Dist. N.Z.	5,734	6,378	*5,419*	*124*	*835*
Makai N.Z.	223	211	*211*	-	-
ATSD N.Z.	268	772	*254*	*50*	*469*

Notes: All indicated population is associated with residential housing or transient accommodation structures, except for the assumed continuation of Kewalo Basin non-residential population in the Makai area. The Aloha Tower Special District site is assumed under this scenario (and under TOD Alternative B) to be even more intensively developed as a retail and office complex, but this time with a substantial residential component.

4.10.2.2 Potential Population Impacts and Recommended Measures to Mitigate Them

Impacts are defined as the difference between the respective TOD Alternative figures and the Future Baseline figures (i.e., TOD Alternative B minus Future Baseline and TOD Alternative A minus Future Baseline). Tables 4-37 and 4-38 provide these results.

Table 4-37: Population – TOD Alternative B Impacts (Alternative B Results Minus Future Baseline Results)

	Total Full-Time Residential Population	Total De Facto Population	*De Facto Resident Population*	*De Facto Part-Time Resident Population*	*De Facto Visitor Population*
KAKA'AKO TOTAL	**9,011**	**10,621**	***8,515***	***354***	***1,752***
% Increase, TOD Alternative B over Future Baseline	26.9%	31.4%	*26.9%*	*16.0%*	*New*
By General Area					
Mauka	8,742	9,849	*8,262*	*304*	*1,283*
Makai	-	-	-	-	-
ATSD (Aloha Tower Special District)	268	772	*254*	*50*	*469*
By Neighborhood Zone					
Pauahi N.Z.	4,152	4,045	*3,923*	*122*	-
Auahi N.Z.	214	841	*203*	*40*	*598*
Central Kaka'ako N.Z.	1,208	1,194	*1,141*	*52*	-
Civic Center N.Z.	-	-	-	-	-
Kapi'olani N.Z.	1,568	1,533	*1,481*	*51*	-
Sheridan N.Z.	-	-	-	-	-
Thomas Sq. Dist. N.Z.	1,601	2,237	*1,513*	*38*	*685*
Makai N.Z.	-	-	-	-	-
ATSD N.Z.	268	772	*254*	*50*	*469*

- At build-out under the TOD Alternative B scenario, the full-time residential and total de facto populations would be respectively 27% and 31% greater than under the Future Baseline Condition (based on current Rules). Under the higher-density Alternative A, they would be 38% and 43%, respectively, greater than under the Future Baseline. Again, the population increase primarily reflects the estimated increase in total units shown in the previous section. The estimated population

increase percentages are slightly greater than the unit increase percentages (26% for Alternative B and 37% for Alternative A) because of growth in places or building types with slightly higher average household sizes or other parameters (such as vacancy rates). However, these differences in percentage points are quite small.

Table 4-38: Population – TOD Alternative A Impacts (Alternative A Results Minus Future Baseline Results)

	Total Full-Time Residential Population	Total De Facto Population	*De Facto Resident Population*	*De Facto Part-Time Resident Population*	*De Facto Visitor Population*
KAKA'AKO TOTAL	**12,715**	**14,379**	***12,015***	***693***	***1,671***
% Increase, TOD Alternative A over Future Baseline	38.0%	42.5%	*38.0%*	*31.2%*	*New*
By General Area					
Mauka	12,446	13,606	*11,762*	*642*	*1,202*
Makai	-	-	-	-	-
ATSD (Aloha Tower Special District)	268	772	*254*	*50*	*469*
By Neighborhood Zone					
Pauahi N.Z.	5,516	5,355	*5,213*	*143*	-
Auahi N.Z.	1,837	2,447	*1,736*	*344*	*367*
Central Kaka'ako N.Z.	1,208	1,194	*1,141*	*52*	-
Civic Center N.Z.	-	-	-	-	-
Kapi'olani N.Z.	1,568	1,533	*1,481*	*51*	-
Sheridan N.Z.	-	-	-	-	-
Thomas Sq. Dist. N.Z.	2,318	3,077	*2,191*	*51*	*835*
Makai N.Z.	-	-	-	-	-
ATSD N.Z.	268	772	*254*	*50*	*469*

- Percentage increases in full-time residential population impacts are estimated to outstrip percentage increases in part-time population impact. This is because additional development capacity assumed for both TOD Alternatives (A and B) would occur in many parts of Kaka'ako, whereas substantial numbers of part-time residents are attracted only to certain parts of the area, such as those with ocean views.

  However, the addition of visitor population (hotel guests) under both TOD Alternatives means the combined de facto population impact – including hotel guests,

part-time residents, and full-time residents actually present on any given day – is slightly larger than the full-time resident population impact for each of the TOD Alternatives (both A and B).

4.10.3 Operational Employment

This Section is concerned with "operational employment" – i.e., full- and part-time jobcounts associated with the *operation* of public and private economic activities, as opposed to the *construction* of new buildings or infrastructure. (Construction employment is addressed in a later Section, which includes public facility and infrastructure projects based in part on these operational jobcount estimates.)

The tables in this Section contain results for estimated total jobcounts in Kakaʻako under all scenarios – Existing, Future Baseline, and both TOD Alternatives – derived by first estimating jobcounts for each specific types of land/building use, and then summing.

It should be remembered that the following figures are not precise projections, but rather order-of-magnitude estimates for a full build-out under each scenario, whether that actually occurs in the year 2035 or sometime thereafter. They are based on previous HCDA datasets and current analyses conducted for the Proposed Action.

Finally, "total jobcount" should not be interpreted as a point-in-time estimate of workers actually present in Kakaʻako. Employees work different shifts (day/night, weekday/ weekend), and factors such as vacations and illnesses affect the actual number of workers present at any one time.

4.10.3.1 Results of Analysis

Existing Conditions: "Existing" results provide context for the subsequent impact assessment that involves comparing the two different future scenarios. The following Table 4-39 indicates a Year 2010 total Kakaʻako jobcount of approximately 31,600 – the vast majority located in the Mauka area, and more than 60% due to Office activity.

Future Baseline Scenario: Under the Future Baseline Scenario (i.e., under current Rules), Table 4-40 contains estimates that sum to a Kakaʻako-wide total jobcount of nearly 51,200 full- and part-time jobs – about a 62% increase over the estimated Existing total in the previous Table.

Note, however, that the vast majority of this employment growth is in the Office category (reflecting assumed growth in Office space), which would comprise about 73% of the operational jobs under this scenario.

Under this Future Baseline Scenario, most jobs still remain in the Mauka area, but Makai jobs increase as a proportion of the total, though again primarily due to assumed development of substantial Office space.

Table 4-39: Estimated Kaka'ako-Specific Operational Jobcount – Existing Scenario

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	JABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKA'AKO TOTAL	**31,546**	**509**	**-**	**4,920**	**19,558**	**3,603**	**2,351**	**440**	**57**	**107**
By General Area										
Mauka	**28,846**	509	-	4,8304	17,974	3,327	2,079		57	97
Makai	**2,660**	-	-	116	1,584	277	232	440	-	11
Aloha Tower Special District (ATSD)	**40**	-	-	-	-	-	40		-	-
By Neighborhood Zone										
Pauahi N.Z.	**8,406**	52	-	127	6,487	1,013	693	-	23	11
Auahi N.Z.	**3,397**	300	-	-	1,626	1,423	6	-	15	27
Central Kaka'ako N.Z.	**5,348**	28	-	605	3,342	235	1,124	-	5	10
Civic Center N.Z.	**2,331**	5	-	1,125	1,148	29	11	-	2	12
Kapi'olani N.Z.	**5,758**	100	-	136	4,967	470	51	-	12	22
Sheridan N.Z.	**350**	11	-	185	140	13	-	-	0	1
Thomas Sq. District N.Z.	**3,255**	14	-	2,626	264	144	194	-	-	14
Makai N.Z.	**2,660**	-	-	116	1,584	277	232	440	-	11
ATSD N.Z.	**40**	-	-	-	-	-	40	-	-	-

Notes: For purposes of this analysis, the "Community Center" (Children's Discovery Center) has been combined with "Civic" in this and subsequent tables. A column for "Hotel Jobs" is inserted to maintain comparability with the later tables, which include this information for the two TOD Alternatives (A and B).

At the level of Neighborhood Zones, the distribution of jobs at build-out (Table 4-40) is relatively more even across areas than was the distribution of population for the Future Baseline Condition (discussed previously in 4.10.2.1. However, the Pauahi Neighborhood Zone still would have the single largest share (25%), followed by the Thomas Square District zone (18%). Numbers in the table equate to 12% to 14% for each of these Neighborhood Zones: Auahi, Central Kaka'ako, Kapi'olani, and Makai (exclusive of the Aloha Tower Special District, or ATSD). Jobs in all these Neighborhood Zones, however, are dominated by the "Office" category, which has in reality been a very slow-growing category.

Table 4-40: Estimated Kakaʻako-Specific Operational Jobcount – Future Baseline Condition

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	JABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKAʻAKO TOTAL	**51,207**	**946**	**-**	**3,461**	**37,186**	**6,358**	**2,509**	**490**	**1**	**256**
By General Area										
Mauka	**43,691**	946	-	2,494	31,994	5,663	2,365		1	229
Makai	**7,180**	-	-	967	5,055	498	145	490	-	24
Aloha Tower Special District (ATSD)	**336**	-	-	-	136	197	-		-	3
By Neighborhood Zone										
Pauahi N.Z.	**13,039**	233	-	2	10,446	1,610	679	-	-	68
Auahi N.Z.	**6,399**	468	-	-	3,886	1,583	412	-	-	50
Central Kaka'ako N.Z.	**6,438**	62	-	483	4,418	286	1,164	-	-	24
Civic Center N.Z.	**1,631**	14	-	835	540	221	9	-	1	11
Kapiʻolani N.Z.	**6,540**	117	-	112	5,301	872	100	-	-	38
Sheridan N.Z.	**360**	9	-	152	180	17	-	-	-	2
Thomas Sq. District N.Z.	**9,285**	43	-	909	7,222	1,075	-	-	-	36
Makai N.Z.	**7,180**	-	-	967	5,055	498	145	490	-	24
ATSD N.Z.	**336**	-	-	-	136	197	-	-	-	3

Proposed Action: Consistent with the decreased Office, Retail, and Industrial space discussed previously, ***both TOD Alternatives result in fewer jobs at build-out than under the Future Baseline Condition.*** That is, the fundamental nature of either one of the TOD Alternatives, A or B, is a relative switch in emphasis from commercial activity to residential development.

The theoretical ultimate total jobcount remains a little higher for TOD Alternative A (about 45,160 in Table 4-42) than for Alternative B (about 43,650 in Table 4-41). Office jobs also drop from the Future Baseline Condition level for TOD Alternative A, and even more for Alternative B, but still comprise more than two-thirds of the total jobcount under each scenario.

Table 4-41: Estimated Kakaʻako-Specific Operational Jobcount – TOD Alternative B

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	JABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKAʻAKO TOTAL	**43,651**	**1,130**	**634**	**3,726**	**29,474**	**5,532**	**2,388**	**490**	**1**	**277**
By General Area										
Mauka	**34,825**	1,113	388	2,758	23,142	4,933	2,244		1	245
Makai	**7,180**	-	-	967	5,055	498	145	490	-	24
Aloha Tower Special District (ATSD)	**1,647**	17	245	-	1,276	101	-		-	8
By Neighborhood Zone										
Pauahi N.Z.	**11,457**	317	-	2	8,649	1,638	772	-	-	79
Auahi N.Z.	**6,595**	481	183	-	3,886	1,583	412	-	-	50
Central Kaka'ako N.Z.	**4,761**	92	-	483	2,901	304	951	-	-	31
Civic Center N.Z.	**1,631**	14	-	835	540	221	9	-	1	11
Kapiʻolani N.Z.	**6,440**	135	-	86	5,497	579	100	-	-	42
Sheridan N.Z.	**360**	9	-	152	180	17	-	-	-	2
Thomas Sq. District N.Z.	**3,581**	65	205	1,200	1,490	590	-	-	-	30
Makai N.Z.	**7,180**	-	-	967	5,055	498	145	490	-	24
ATSD N.Z.	**1,647**	17	245	-	1,276	101	-	-	-	8

The projected reduction (compared to the Future Baseline) in jobs is all in the Mauka area, as the Makai jobcounts – exclusive of the ATSD – in both Tables 4-41 and 4-42 are identical to the Future Baseline jobcount number in Table 4-40 (7,180). However, the number of jobs associated with the ATSD site is larger for each TOD Alternative (about 1,650) than under the Future Baseline Condition, reflecting assumed additional development capacity there.[12]

12 The ATSD parcel is the site of the current HECO power plant facility. It should be noted that HECO has taken the power plant offline but currently plans to retain it for back-up purposes – *not* to redevelop it as assumed for the Future Baseline and TOD Overlay scenarios. Again, this study looks at what HCDA envisions and/or would permit under current or proposed Rules; it does not obligate landowners to implement the scenarios described here.

Table 4-42: Estimated Kakaʻako-Specific Operational Jobcount – TOD Alternative A

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	JABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKAʻAKO TOTAL	**45,157**	**1,259**	**608**	**3,726**	**30,397**	**5,970**	**2,418**	**490**	**1**	**289**
By General Area										
Mauka	**36,330**	1,242	363	2,758	24,065	5,371	2,273		1	257
Makai	**7,180**	-	-	967	5,055	498	145	490	-	24
Aloha Tower Special District (ATSD)	**1,647**	17	245	-	1,276	101	-		-	8
By Neighborhood Zone										
Pauahi N.Z.	**12,706**	338	-	2	9,601	1,880	801	-	-	84
Auahi N.Z.	**6,630**	582	112	-	3,886	1,583	412	-	-	55
Central Kaka'ako N.Z.	**4,761**	92	-	483	2,901	304	951	-	-	31
Civic Center N.Z.	**1,631**	14	-	835	540	221	9	-	1	11
Kapiʻolani N.Z.	**6,440**	135	-	86	5,497	579	100	-	-	42
Sheridan N.Z.	**360**	9	-	152	180	17	-	-	-	2
Thomas Sq. District N.Z.	**3,802**	73	250	1,200	1,461	786	-	-	-	32
Makai N.Z.	**7,180**	-	-	967	5,055	498	145	490	-	24
ATSD N.Z.	**1,647**	17	245	-	1,276	101	-	-	-	8

The *proportionate* geographic distribution of jobs, compared to the Future Baseline Condition percentages discussed above, shows more change than did population distribution – mostly a sharp reduction in potential future jobs in the Thomas Square District Neighborhood Zone (down to 8% in both TOD Alternatives) due to Office jobs declining more than anywhere else. However, as with population, the Pauahi zone gains some percentage points (up to 26% for Alternative B and 28% for Alternative A), as does the Auahi zone (up to 15% for each TOD Alternative). The Makai and ATSD zones also increase a few points proportionately. The reality of these shifts once more depends not only on landowner action to implement these changes, but also on a substantial increase in market demand for Office space.

4.10.3.2 Potential Impacts and Recommended Measures to Mitigate Them

Table 4-43 and 4-44 shows "impacts," as the difference between each of the TOD Alternatives and the Future Baseline Scenario results. These reflect the basic overall nature of the difference between either of the TOD Alternatives versus the Future Baseline Condition – substantially more residential development, somewhat less commercial activity – flowing from the land/building use changes documented in Section 4.10.1:

- About 12% fewer total Kakaʻako-wide jobs (about 6,050 in absolute number) under TOD Alternative A than under the Future Baseline Condition – and 15% fewer (about 7,560) under Alternative B – with total job reductions greatest in the Thomas Square District and Central Kakaʻako Neighborhood Zones. The density reductions in Alternative B would also result in the loss of more potential jobs in the Pauahi zone.

- A particularly large proportionate reduction (more or less 20% for each TOD Alternative) in Office jobs, accompanied by a proportionately large (33% for TOD Alternative A and 19% for Alternative B) increase in Residential management/ maintenance jobs – though the *absolute* number of projected additional Residential jobs is still relatively low (about 300 for Alternative A and under 200 for Alternative B).

- About 15% fewer total Kakaʻako-wide jobs (7,900 in absolute number) under the Proposed Action than under the Future Baseline Scenario, with job reductions greatest in the Pauahi and Thomas Square District Neighborhood Zones.

- A particularly large reduction (21%) in Office jobs, accompanied by a proportionately large (37%) increase in Residential management/maintenance jobs, though the absolute number of additional Residential jobs is still just about 340.

As the provision of new employment opportunities is considered to be a beneficial impact, no mitigative measures are warranted.

Table 4-43: Kaka`ako Specific Operational Jobcount – TOD Alternative B Impacts (Alternative B Results Minus Future Baseline Results)

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	JABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKA'AKO TOTAL	**(7,555)**	**184**	**634**	**265**	**(7,712)**	**(826)**	**(121)**	**-**	**-**	**22**
% Increase, TOD Alternative B over Future Baseline	**(14.8%)**	19.4%	N/A	7.6%	(20.7%)	(13.0%)	(4.8%)	0.0%	0.0%	8.5%
By General Area										
Mauka										
Makai	**(8,866)**	167	388	265	(8,852)	(731)	(121)	-	-	17
Aloha Tower Special District (ATSD)	**-**	-	-	-	-	-	-	-	-	-
	1,311	17	245	-	1,140	(96)	-	-	-	5
By Neighborhood Zone										
Pauahi N.Z.										
Auahi N.Z.	**(1,582)**	85	-	-	(1,797)	28	92	-	-	11
Central Kaka'ako N.Z.	**197**	13	183	-	-	-	-	-	-	1
Civic Center N.Z.	**(1,676)**	29	-	-	(1,518)	18	(213)	-	-	7
Kapi'olani N.Z.	**-**	-	-	-	-	-	-	-	-	-
Sheridan N.Z.	**(101)**	18	-	(26)	195	(292)	-	-	-	4
Thomas Sq. District N.Z.	**-**	-	-	-	-	-	-	-	-	-
Makai N.Z.	**(5,705)**	22	205	290	(5,732)	(485)	-	-	-	(6)
ATSD N.Z.	**-**	-	-	-	-	-	-	-	-	-

Note: Figures in parentheses are negatives.

Table 4- 44: Kaka`ako Specific Operational Jobcount – TOD Alternative A Impacts (Alternative A Results Minus Future Baseline Results)

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	JABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKA'AKO TOTAL	**(6,050)**	**313**	**608**	**265**	**(6,789)**	**(389)**	**(91)**	**-**	**-**	**33**
% Increase, TOD Alternative A over Future Baseline	**(11.8%)**	33.0%	N/A	7.6%	(18.3%)	(6.1%)	(3.6%)	0.0%	0.0%	13.1%
By General Area										
Mauka	**(7,361)**	296	363	265	(7,929)	(293)	(91)	-	-	29
Makai	**-**	-	-	-	-	-	-	-	-	-
Aloha Tower Special District (ATSD)	**1,311**	17	245	-	1,140	(96)	-	-	-	5
By Neighborhood Zone										
Pauahi N.Z.	**(333)**	105	-	-	(846)	270	122	-	-	16
Auahi N.Z.	**232**	114	112	-	-	-	-	-	-	6
Central Kaka'ako N.Z.	**(1,676)**	29	-	-	(1,518)	18	(213)	-	-	7
Civic Center N.Z.	**-**	-	-	-	-	-	-	-	-	-
Kapi'olani N.Z.	**(101)**	18	-	(26)	195	(292)	-	-	-	4
Sheridan N.Z.	**-**	-	-	-	-	-	-	-	-	-
Thomas Sq. District N.Z.	**(5,483)**	30	250	290	(5,761)	(289)	-	-	-	(4)
Makai N.Z.	**-**	-	-	-	-	-	-	-	-	-
ATSD N.Z.	**1,311**	17	245	-	1,140	(96)	-	-	-	5

Note: Figures in parentheses are negatives.

4.10.4 Construction Employment

4.10.4.1 Results of Analysis

This section provides estimates of the *cumulative* Kakaʻako-specific construction-related employment impacts, in terms of "job-years." Results are provided for Future Baseline Condition and the two TOD Alternatives only, as construction has already occurred for "Existing" Kakaʻako structures.

The construction impacts come primarily from development of new buildings – determined by comparing the Future Baseline (as well as the TOD Alternatives that represent adjusted versions of the Future Baseline) to the Existing conditions in order to identify new structures. However, some of the construction activity also comes from development of (a) additional public facilities, and (b) additional public infrastructure.

Future Baseline Condition: Exclusive of whatever jobs may be generated by Makai public infrastructure, Table 4-45 below indicates a total of about 55,600 job-years of construction for full build-out of the Future Baseline Condition, more than half associated with residential buildings.

Under the Future Baseline Condition, about 39% of the total construction job-years over time would be located in the Pauahi Neighborhood Zone, 23% in Auahi, and 11% in the Thomas Square District Neighborhood Zone.

4.10.4.2 Potential Impacts and Recommended Measures to Mitigate Them

Table 4-46 and Table 4-47 show significantly more estimated job-years of construction for the TOD Alternatives (about 69,000 for Alternative B and 76,000 for the higher-density Alternative A) than under the Future Baseline Condition.

As with the Future Baseline Condition, but to an even greater extent, construction activity and employment is concentrated:

- In development of Residential structures and Parking; and

- Primarily although not completely within the Pauahi (about 40% for both TOD Alternatives) and Auahi (20% for Alternative B and 23% for Alternative A) Neighborhood Zones – i.e., proportionately a little more in Pauahi and, for Alternative B, a little less in Auahi than the Future Baseline Condition figures above. The percentage for the Thomas Square District zone remains the same at 11% for each TOD Alternative.

Table 4-48 and Table 4-49 show "impacts," defined as the difference between results for each of the TOD Alternatives and results for the Future Baseline Condition.

Table 4-45: Estimated Kakaʻako-Specific Construction Jobcount – Future Baseline Condition

	TOTAL (Job-years)	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	Garage Parking Jobs	Infrastructure and Public Facilities
KAKAʻAKO TOTAL	**55,838**	**30,741**	**0**	**1,313**	**8,382**	**3,088**	**739**	**10,481**	**1,093**
By General Area									
Mauka	**50,686**	30,741	0	309	6,954	2,663	739	9,279	0
Makai	**3,693**	0	0	1,004	1,379	293	0	1,016	0
Aloha Tower Special District (ATSD)	**367**	0	0	0	49	131	0	186	0
Unallocated*	**1,093**	**0**	**0**	**0**	0	0	0	0	1,093
By Neighborhood Zone									
Pauahi N.Z.	**21,432**	13,701	0	0	2,736	794	222	3,980	0
Auahi N.Z.	**12,731**	7,892	0	0	1,253	1,031	134	2,422	0
Central Kaka'ako N.Z.	**3,868**	2,057	0	50	706	99	380	576	0
Civic Center N.Z.	**1,195**	804	0	113	8	86	3	181	0
Kapiʻolani N.Z.	**4,322**	2,448	0	0	766	229	0	879	0
Sheridan N.Z.	**855**	587	0	146	36	6	0	80	0
Thomas Sq. District N.Z.	**6,281**	3,252	0	0	1,449	418	0	1,162	0
Makai N.Z.	**3,693**	0	0	1,004	1,379	293	0	1,016	0
ATSD N.Z.	**367**	0	0	0	49	131	0	186	0
Unallocated*	**1,093**	**0**	**0**	**0**	0	0	0	0	1,093

* "Unallocated" refers to infrastructure and public facilities, as either exact future locations are unknown or else they may extend through various geographical areas.
Note: Small percentages of these figures consist of jobs generated through "soft costs" (primarily architectural and engineering) that would in all likelihood be located outside these specific geographical areas and quite possibly outside Kakaʻako itself. Some of the "Unallocated" infrastructure and public facility direct construction jobs could also be located outside Kakaʻako – e.g., construction of schools or other public facilities serving Kakaʻako but not located in Kakaʻako. Consistent with text discussion, however, public infrastructure jobs related to Makai development (outside the ATSD) are not counted, and so "Unallocated" jobs are most likely to be in the Mauka or ATSD areas.

Table 4-46: Estimated Kakaʻako-Specific Construction Jobcount – TOD Alternative B

	TOTAL (Job-years)	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	Garage Parking Jobs	Infrastructure and Public Facilities
KAKAʻAKO TOTAL	**69,220**	**43,702**	**768**	**1,446**	**6,769**	**2,758**	**700**	**11,770**	**1,307**
By General Area									
Mauka	**62,368**	43,112	544	442	4,929	2,398	700	10,243	0
Makai	**3,693**	0	0	1,004	1,379	293	0	1,016	0
Aloha Tower Special District (ATSD)	**1,853**	590	223	0	461	67	0	511	0
Unallocated*	**1,307**	0	0	0	0	0	0	0	1,307
By Neighborhood Zone									
Pauahi N.Z.	**28,261**	20,404	0	0	2,087	812	252	4,706	0
Auahi N.Z.	**13,495**	8,363	247	0	1,253	1,031	134	2,467	0
Central Kaka'ako N.Z.	**4,993**	3,323	0	50	401	106	310	802	0
Civic Center N.Z.	**1,195**	804	0	113	8	86	3	181	0
Kapiʻolani N.Z.	**6,055**	4,072	0	0	846	126	0	1,011	0
Sheridan N.Z.	**677**	562	0	0	36	6	0	73	0
Thomas Sq. District N.Z.	**7,691**	5,584	298	279	299	230	0	1,003	0
Makai N.Z.	**3,693**	0	0	1,004	1,379	293	0	1,016	0
ATSD N.Z.	**1,853**	590	223	0	461	67	0	511	0
Unallocated*	**1,307**	0	0	0	0	0	0	0	1,307

* "Unallocated" refers to infrastructure and public facilities, as either exact future locations are unknown or else they may extend through various geographical areas.
Note: (Small percentages of these figures consist of jobs generated through "soft costs" (primarily architectural and engineering) that would in all likelihood be located outside these specific geographical areas and quite possibly outside Kakaʻako itself. Some of the "Unallocated" infrastructure and public facility direct construction jobs could also be located outside Kakaʻako – e.g., construction of schools or other public facilities serving Kakaʻako but not located in Kakaʻako. Consistent with text discussion, however, public infrastructure jobs related to Makai development (outside the ATSD) are not counted, and so "Unallocated" jobs are most likely to be in the Mauka or ATSD areas.

Table 4-47: Estimated Kakaʻako-Specific Construction Jobcount – TOD Alternative A

	TOTAL (Job-years)	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	Garage Parking Jobs	Infrastructure and Public Facilities
KAKAʻAKO TOTAL	**76,196**	**49,395**	**673**	**1,446**	**7,107**	**2,996**	**709**	**12,496**	**1,374**
By General Area									
Mauka	**69,276**	48,805	449	442	5,267	2,635	709	10,969	0
Makai	**3,693**	0	0	1,004	1,379	293	0	1,016	0
Aloha Tower Special District (ATSD)	**1,853**	590	223	0	461	67	0	511	0
Unallocated*	**1,374**	0	0	0	0	0	0	0	1,374
By Neighborhood Zone									
Pauahi N.Z.	**30,641**	21,936	0	0	2,430	974	262	5,039	0
Auahi N.Z.	**17,308**	11,930	151	0	1,253	1,031	134	2,808	0
Central Kaka'ako N.Z.	**4,993**	3,323	0	50	401	106	310	802	0
Civic Center N.Z.	**1,195**	804	0	113	8	86	3	181	0
Kapiʻolani N.Z.	**6,055**	4,072	0	0	846	126	0	1,011	0
Sheridan N.Z.	**677**	562	0	0	36	6	0	73	0
Thomas Sq. District N.Z.	**8,407**	6,178	298	279	293	306	0	1,054	0
Makai N.Z.	**3,693**	0	0	1,004	1,379	293	0	1,016	0
ATSD N.Z.	**1,853**	590	223	0	461	67	0	511	0
Unallocated*	**1,374**	0	0	0	0	0	0	0	1,374

* "Unallocated" refers to infrastructure and public facilities, as either exact future locations are unknown or else they may extend through various geographical areas.

Note: (Small percentages of these figures consist of jobs generated through "soft costs" (primarily architectural and engineering) that would in all likelihood be located outside these specific geographical areas and quite possibly outside Kakaʻako itself. Some of the "Unallocated" infrastructure and public facility direct construction jobs could also be located outside Kakaʻako – e.g., construction of schools or other public facilities serving Kakaʻako but not located in Kakaʻako. Consistent with text discussion, however, public infrastructure jobs related to Makai development (outside the ATSD) are not counted, and so "Unallocated" jobs are most likely to be in the Mauka or ATSD areas.

Table 4-48: Kakaʻako-Specific Construction Jobcount – TOD Alternative B Impacts (Alternative B Results Minus Future Baseline Results)

	TOTAL (Job-years)	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	Garage Parking Jobs	Infrastructure and Public Facilities
KAKAʻAKO TOTAL	**13,382**	**12,961**	**768**	**133**	**(1,613)**	**(330)**	**(39)**	**1,289**	**214**
% Increase, TOD Alternative B over Future Baseline	**24.1%**	42.2%	N/A	10.1%	-19.2%	-10.7%	-5.3%	12.3%	24.7%
By General Area									
Mauka	**11,682**	12,371	544	133	(2,025)	(266)	(39)	964	0
Makai	**0**	0	0	0	0	0	0	0	0
Aloha Tower Special District (ATSD)	**1,486**	590	223	0	412	(64)	0	325	0
Unallocated*	**214**	0	0	0	0	0	0	0	214
By Neighborhood Zone									
Pauahi N.Z.	**6,829**	6,704	0	0	(649)	19	30	726	0
Auahi N.Z.	**763**	471	247	0	0	0	0	45	0
Central Kaka'ako N.Z.	**1,125**	1,266	0	0	(305)	7	(70)	226	0
Civic Center N.Z.	**0**	0	0	0	0	0	0	0	0
Kapiʻolani N.Z.	**1,733**	1,624	0	0	79	(103)	0	133	0
Sheridan N.Z.	**(178)**	(26)	0	(146)	0	0	0	(7)	0
Thomas Sq. District N.Z.	**1,410**	2,331	298	279	(1,150)	(188)	0	(159)	0
Makai N.Z.	**0**	0	0	0	0	0	0	0	0
ATSD N.Z.	**1,486**	590	223	0	412	(64)	0	325	0
Unallocated*	**214**	0	0	0	0	0	0	0	214

* "Unallocated" refers to infrastructure and public facilities, as either exact future locations are unknown or else they may extend through various geographical areas.

Notes: (1) Figures in parentheses are negatives. (2) Small percentages of these figures consist of jobs generated through "soft costs" (primarily architectural and engineering) that would in all likelihood be located outside these specific geographical areas and quite possibly outside Kakaʻako itself. Some of the "Unallocated" infrastructure and public facility direct construction jobs could also be located outside Kakaʻako – e.g., construction of schools or other public facilities serving Kakaʻako but not located in Kakaʻako.

Table 4-49: Kakaʻako-Specific Construction Jobcount – TOD Alternative A Impacts (Alternative B Results Minus Future Baseline Results)

	TOTAL (Job-years)	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	Garage Parking Jobs	Infrastructure and Public Facilities
KAKAʻAKO TOTAL	**20,359**	**18,654**	**673**	**133**	**(1,275)**	**(92)**	**(30)**	**2,015**	**281**
% Increase, TOD Alternative A over Future Baseline	**36.6%**	60.7%	N/A	10.1%	-15.2%	-3.0%	-4.0%	19.2%	32.5%
By General Area									
Mauka	**18,591**	18,064	449	133	(1,687)	(28)	(30)	1,690	0
Makai	**0**	0	0	0	0	0	0	0	0
Aloha Tower Special District (ATSD)	**1,486**	590	223	0	412	(64)	0	325	0
Unallocated*	**281**	0	0	0	0	0	0	0	281
By Neighborhood Zone									
Pauahi N.Z.	**9,209**	8,235	0	0	(305)	180	40	1,059	0
Auahi N.Z.	**4,576**	4,038	151	0	0	0	0	387	0
Central Kaka'ako N.Z.	**1,125**	1,266	0	0	(305)	7	(70)	226	0
Civic Center N.Z.	**0**	0	0	0	0	0	0	0	0
Kapiʻolani N.Z.	**1,733**	1,624	0	0	79	(103)	0	133	0
Sheridan N.Z.	**(178)**	(26)	0	(146)	0	0	0	(7)	0
Thomas Sq. District N.Z.	**2,126**	2,926	298	279	(1,156)	(112)	0	(108)	0
Makai N.Z.	**0**	0	0	0	0	0	0	0	0
ATSD N.Z.	**1,486**	590	223	0	412	(64)	0	325	0
Unallocated*	**281**	0	0	0	0	0	0	0	281

* "Unallocated" refers to infrastructure and public facilities, as either exact future locations are unknown or else they may extend through various geographical areas.

Notes: (1) Figures in parentheses are negatives. (2) Small percentages of these figures consist of jobs generated through "soft costs" (primarily architectural and engineering) that would in all likelihood be located outside these specific geographical areas and quite possibly outside Kakaʻako itself. Some of the "Unallocated" infrastructure and public facility direct construction jobs could also be located outside Kakaʻako – e.g., construction of schools or other public facilities serving Kakaʻako but not located in Kakaʻako.

As with operational jobs, results for construction jobs reflect the basic overall nature of the difference in the Future Baseline versus the two TOD Alternatives – substantially more residential development, somewhat less commercial activity – flowing from the land/building use changes documented in Chapter Two:

- Overall, about 37% more construction job-years would be required to build out the TOD Alternative A scenario than the Future Baseline Condition, and 24% more than the Future Baseline for Alternative B.

- Most of the additional construction employment is associated with residential development (61% increase over Future Baseline number for TOD Alternative A, 42% for Alternative B), though with a proportionately high increase in construction job-years associated with needed new public facilities and infrastructure as well.

- For both TOD Alternatives, there are small decreases in construction employment associated with Office, Retail, and Industrial development, though these are roughly balanced by additional construction employment associated with additional Parking Garage and Hotel development.

Again, impacts are numerically most apparent in the Pauahi and Auahi Neighborhood Zones.

As the provision of new employment opportunities is considered to be a beneficial impact, no mitigative measures are warranted.

4.10.5 Housing

4.10.5.1 Results of Analysis

The enabling statue for the HCDA provides that as a condition of redevelopment in residential use within the KCDD, development should include a mixture of densities, building types, and configurations in accordance with appropriate urban design guidelines; the integration, both vertically and horizontally, of residents of varying incomes, ages, and family groups; and an increased supply of housing for residents of low- or moderate-income.

As described in Section 4.10.1.1, there are approximately 8,618 existing residential units in the Mauka Area. Under the Future Baseline Condition, that number would increase by approximately 12,258 units to a total of 21,146 units. Pursuant to the HCDA's current Reserved Housing program, twenty percent of new units constructed shall be reserved as for families/individuals that qualify under the Federal government's affordability guidelines. The Future Baseline Condition would, therefore, yield approximately 2,505 new affordable units.

4.10.5.2 Potential Impacts and Recommended Measures to Mitigate Them

Under TOD Alternative A, the total number of residential units in the Mauka Area at full build out is estimated to be 28,765; an increase of approximately 20,147 units over existing conditions, and about 7,619 more units than the Future Baseline Condition. Implementation of the current Reserved Housing program would yield approximately 4,029 affordable units.

Under TOD Alternative B, the total number of residential units in the Mauka Area is estimated to be 26,588; an increase of approximately 17,970 units over the existing condition. Implementation of the current Reserved Housing program would yield approximately 3,594 affordable units, or 435 less than under TOD Alternative A.

Redevelopment in the Mauka Area may result in the displacement of some tenants and/or apartment or condominium unit owners if the owner of an under-utilized property decides to redevelop to achieve the maximum allowable density.

In implementing the transit oriented development plan (TOD) overlay for the KCDD, HCDA's reserved housing program shall be geared toward housing product types that target the low- or moderate-income groups instead of the entire affordable spectrum. There are other State agencies such as the Hawaii Housing, Finance and Development Corporation (HHFDC) that specialize in the development of broad-spectrum affordable housing. Since inception of the Mauka Area Plan, affordable housing units have been developed there by state agencies. Up until now HCDA's focus has been to stimulate the production of housing units for workforce buyers from 100 percent up to 140 percent of area median income (AMI) by ensuring that a portion of residential projects are set aside, or *reserved* for this income group. However, given the lack of housing units that serve the low- to moderate-income families in urban Honolulu, HCDA will adjust its reserved housing focus to address the housing needs of this income group.

Therefore, as part of the TOD overlay for KCDD, HCDA's reserved housing will focus on providing housing needs for households earning between 80 to 120 percent of the area median income, which is considered to be the low to mid income range. A housing demand study prepared by the City & County of Honolulu projects housing demand from 2012 to 2016 to be in the range of 25,000 units and span the area median income of less than 30% to 140%. Approximately a third of this housing demand is from the 80-120 percent area median income group. Only about 6% of the housing demand is from area median income group between 120% to 140%. Given this concentration of demand at the 80-120 area median income, it is imperative that HCDA realign its reserved housing policy to address the housing needs of this income group. The HCDA will also develop a standard for what percentages of the required reserved housing should be provided for particular levels of AMI.

Given the extreme need for affordable housing on O`ahu and, especially within urban Honolulu, a broad strategy for developing affordable housing needs to be considered. Currently, only residential development in the KCDD is required to provide reserved

housing. Moving forward, HCDA will consider other types of development that generate housing demand and therefore will revise its requirement for providing reserved housing. For example, the TOD overlay provides for hotel uses in the KCDD, which generate additional employment opportunities within the district, and therefore, need for additional affordable housing.

It is therefore proposed that the TOD overlay include a reserved housing requirement for new land-use types such as hotel use as well as for commercial developments. In addition the TOD overlay will expand the requirement for providing reserved housing from a development lot area-based standard to a residential unit count-based standard.

The current Kaka`ako Reserved Housing rules require that multi-family residential developments on lots greater than 20,000 square feet provide reserved housing as a condition for development permit application approval. Given the increase in development envisioned in the TOD overlay plan, together with its incentive-based zoning program, it is reasonable that the reserved housing requirement be based on these parameters. Therefore, the TOD overlay plan proposes that any multifamily residential project of 10 residential units or more shall be subject to a requirement to provide reserved housing. The HCDA will also develop a rational formula for reserved housing requirements for hotel and other commercial use. To provide incentives to developers to build larger units as well as discourage over-building of efficiency units, the HCDA will also consider a multiplier factor for unit type and size. For example, a standard reserved housing unit could be a 2 bedroom, 1.5-bath unit and would be considered the standard unit (with a base factor of 1). Any unit bigger than that, such as a 2 bedroom/2 bath or a 3 bedroom/2 bath unit, would have a multiplier factor of greater than one. Units smaller than the standard unit would have a multiplier factor of less than 1.

Inclusionary Housing: The HCDA prefers that all reserved housing units be provided on the proposed project site, generally known as "inclusionary". Inclusionary housing programs facilitate the creation of housing for the workforce and enable families of moderate means to benefit from urban redevelopment. The resulting mixed income communities generate several community-wide benefits. They broaden access to well-funded schools, strong municipal services, and emerging job centers. And they also provide opportunities for lower-wage earning families to buy homes in appreciating housing markets, to accumulate wealth, and to share a part of the "American Dream". Inclusionary housing has a proven track record of meeting a community's goal of providing housing available to residents of a wider economic range.

Although the preference is for inclusionary reserved housing units, the HCDA's enabling statute provides for provisions of developing reserved housing units outside of the project within the KCDD or outside of the KCDD. If a developer finds it necessary to produce the reserved housing offsite, such a request will be evaluated on a project-by-project basis and could receive credits under HCDA's housing program, although at a lower credit value than onsite units.

Preference for Units vs. In-Lieu Fees: In rare instances, when there is a compelling reason why reserved housing units cannot be included or developed offsite, HCDA may consider accepting an "in-lieu" fee. However, in-lieu fees place the burden of developing reserved housing units on HCDA; therefore, HCDA's preference is for the developers to construct the reserved housing units themselves rather than to allow payments of in-lieu fees. Except to resolve a case of fractional units, in-lieu fees will be discouraged. The HCDA will develop workable formula for determining the in-lieu fee. In-lieu fees received will be deposited in HCDA Reserved Housing Sub-Account.

Cost Offsets: An effective Reserved Housing program usually offers developers a range of cost offsets to achieve a double bottom line: reserved housing for the public and a reasonable overall return for the developer. Profitability in the Mauka Area is important to ensure that developers will actually build in Kaka`ako, and therefore will be factored into any Reserved Housing formula, especially since the development of any reserved housing depends on the development of housing in general. To achieve this, the TOD overlay plan proposes an incentive-based zoning program within the KCDD on land parcels identified as having potential for TOD.

Maintaining Affordability: Reserved housing units should remain affordable as long as is reasonable. Therefore, long-term constraints on sales of reserved housing for future generations are needed to preserve the inventory of these units. Long-term affordability may be achieved by different means, such as equity sharing upon resale, and/or a buy-back option in favor of HCDA. The HCDA enabling statute provides for a buy-back period of 10 years. Programs with long-term affordability terms can call for a sharing of equity upon resale that, while providing the incentive of the creation of wealth for the owner, makes reserved housing ownership financially less attractive for speculators. These terms allow the owner to build some equity while effectively eliminating profiteering. If homeowners decide to sell the unit prior to the expiration of the buy-back term, the purchase price to HCDA should be set as low as possible to the original reserved purchase price so the unit can be resold to another qualified buyer. Therefore, the buy-back price shall be based on the original reserved purchase price inflated only by an appropriate inflationary index and owner paid unit improvements.

Another method for establishing the buy-back price would be indexing the sale price to AMI. Both methods allow for the owner to extract some equity while keeping the unit still affordable.

On Reserved Housing units, HCDA proposes to require perpetual equity sharing with an allowance for the build-up of equity for the homeowner from the point of original purchase according to the homeowner's percentage share of ownership. The remaining portion of the equity would revert to HCDA's Reserved Housing Sub-Account upon resale. The equity-sharing feature suggests that the highest possible market sale price would be desirable. The proportion of the equity percentage will be established by the owner's purchase payment divided by the appraised market value for that unit at the point of original purchase. To achieve long-term affordability, as part of the TOD overlay plan the HCDA will consider the requirement of first option to purchase at all subsequent sale of

reserved housing units. Once HCDA purchases the reserved housing units, it can re-sell the unit at reserved housing price and maintain affordability. Repeating this for each subsequent resale of reserved housing would assist in achieving long-term affordability.

Proposed Reserved Housing Program Checklist: The following summarizes HCDA's plans to provide affordable housing as part of the TOD Overlay Plan:

- Residential Projects that include residential units of 10 or more must provide at least 20% of the residential units as reserved housing units.
- Hotels and other commercial development shall have the requirement to provide reserved housing. The HCDA will develop a formula for the number of units to be provided.
- The reserved housing price shall be based on area median income of 80-120%. The HCDA shall develop a formula for what percentages of the reserved housing units are provided at what AMI level.
- As much as feasible, the HCDA will couple the reserved housing requirement with incentive-based zoning. The number of reserved housing units required for a particular project should in in line with the incentive provided for the project.
- The developer must sell the units, priced between 80-120 percent of AMI, to qualified buyers with deeded covenants in favor of HCDA that include a buy-back provision for every successive future sale of the unit, and in the event that the HCDA waves its right to buy-back, a perpetual equity sharing provision.
- The buy-back price shall be based on the original purchase price, inflated by an appropriate index plus owner-paid unit improvements; or indexed to the AMI at the time of resale, whichever is lower.
- A reserved housing buyer shall set an equity-sharing percentage at the time of the original purchase. HCDA's share of the equity upon resale will be transferred to the HCDA's Reserved Housing Sub-Account in the event that HCDA waves its right to buy back the unit.

The developer may also choose to develop rental units, in which case the reserved housing units shall be rented to tenants qualified between 80 to 100 percent of AMI. Such rental units shall remain as reserved housing for a period of 30 years. The developer will be responsible for managing such units. After the regulated period the reserved housing units may be sold with HCDA or a successor agency having the first option to purchase.

4.10.6 Health Care

4.10.6.1 Results of Analysis

Public Health – Emergency Services: The City and County of Honolulu Emergency Services Dept.[13] has two divisions –

[13] Information in this section reflects various communications with and from Director Mark Rigg, October to December 2013.

- Ocean Safety and Lifeguard Services Division. This Division is City-funded and focuses on marine emergencies. The Division is not directly affected by population or economic changes in Kakaʻako (except indirectly through harbor and beach park usage), or any other specific geographical neighborhood on land. However, the Department is in discussions with HCDA to provide land on a lease basis for a new Ocean Safety Facility at Kewalo Basin, to replace a current facility in the Waikīkī Natatorium, which is to be demolished. The Department expects to request City Council funding approval in FY2016. This activity is independent of the Proposed Action, and so no further discussion of Ocean Safety functions will be made here.

- Emergency Medical Services Division (EMSD). This Division – administered by the City but ultimately funded by the State Dept. of Health – provides emergency medical service and ambulance transportation in response to land-based crises. The EMSD will be the primary focus of this discussion.

Islandwide, there are 20 EMS units and two single-response units. These are EMS emergency response vehicles staffed with a single paramedic and treats victims on scene until a transport unit arrives. Of these, five EMS units serve the overall metropolitan area from Waikīkī to Kalihi/Iwilei. There are no specific service-area boundaries, but Kakaʻako is usually served by either (1) the Makiki and Metro One EMS units at 1426 Young St., or (2) the Baker One unit located at the Queen's Medical Center, 1301 Punchbowl St.

Given current population growth, the EMSD considers metropolitan Honolulu to be on the cusp of needing a new EMS unit. The Department is also now (late 2013) in discussions with HCDA about another 24-hour/day site in Kakaʻako (in the area where Fisherman's Wharf now stands) to meet this need. A tentative plan is to locate a trailer from which the ambulance crew could operate, as has been done in other parts of the island. Although this action, if it occurs, would also be independent of substantial future Kakaʻako population growth, it does raise the strong possibility that Kakaʻako would be effectively served long before 2035 by at least one new EMS station – although that station may also serve other nearby neighborhoods as well.

Medical Facilities: Assessment of impacts on medical facilities differs from other analyses in that service is provided by a network of providers rather than a single agency. Most are private-sector providers, and so it is generally difficult and/or inappropriate to estimate costs that would be borne by government. Medical facilities are of several types:

- Acute Care Facilities: These offer a wide range of medical, surgical, obstetric and pediatric services. These facilities primarily treat patients with conditions that require a hospital stay of fewer than 30 days.[14]

- Long-Term Care Facilities: These may be defined as institutions (such as nursing homes and skilled nursing facilities) that provide healthcare to people who are unable

[14] Blue Cross Blue Shield Blue Care Network. [December 2013]. http://www.bcbsm.com/index/health-insurance-help/glossary.html

to manage independently in the community.[15] They are either freestanding or hospital-based.

- Specialty Care Facilities: These are acute care facilities that provide specialized services and specially trained personnel to care for a specific portion of the injured population, such as pediatric, burn injury, or spinal cord injury patients.[16]

Many of these facilities are run by the private sector, though with overall supervision by the Hawai'i State Dept. of Health. Table 4-50 shows that the number of State approved medical facilities has been declining since 2000:

Table 4-50: Number of State Approved Medical Facilities 2000-2010

Number of Facilities	Acute Care(1)	Long-term Care(1)	Specialty Care	Total(2)
2000	24	45	24	**74**
2001	21	45	22	**73**
2002	20	45	23	**72**
2003	20	45	19	**68**
2004	22	47	20	**70**
2005	21	49	17	**68**
2006	19	43	13	**62**
2007	19	46	13	**63**
2008	19	46	14	**66**
2009	20	49	14	**69**
2010	20	48	15	**70**

Source: Hawai`i State Data Book-2012. Table 2.25 Number and Bed Capacity of State-Approved Facilities, By Type of Facility 2000-2010. http://dbedt.hawaii.gov/economic/databook/db2012/
Notes: Excludes Tripler Army Medical Center. Figures based on facilities that reported their activity.
(1) Acute/SNF swing beds are classified as long-term care.
(2) Institutions providing more than one kind of care are counted only once.

Present Conditions: Kaka'ako is not uniquely served by any one of the above types of health care facilities. It is part of the wider metropolitan Honolulu area currently served by numerous facilities, none of which (with the exception of a clinic associated with the John A. Burns School of Medicine) is now located in Kaka'ako itself –

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15 Center for Disease Control and Prevention. [December 2013]. http://www.cdc.gov/HAI/settings/ltc_settings.html

16 National Highway Traffic Safety Administration. 1996. *EMS Agenda for the Future*. Washington, D.C. [December 2013]. http://www.nhtsa.gov/people/injury/ems/emstraumasystem03/glossary.htm

- **Acute Care Hospitals** serving Kakaʻako and other parts of urban Honolulu include the Queen's Medical Center (a private non-profit facility the largest hospital in Hawaiʻi, a trauma hospital, and a part of the Queen's Health Systems), Kuakini Medical Center (a non-profit hospital that is part of the Kuakini Health System), and the Straub Clinic and Hospital (also a non-profit hospital under the Hawaiʻi Pacific Health System).

- **Long-Term Care Hospitals** serving the wider Honolulu area (including but not limited to Kakaʻako) include (a) Lēʻahi Hospital, which is a State-run nursing facility and tuberculosis hospital; (b) Kuakini Medical Center and The Queen's Medical Center, which also offer hospital-based skilled nursing services; (c) Maluhia; (d) Hale Nani; (e) Oahu Care Facility; (f) Island Nursing and Rehab Center; and several other skilled nursing facilities.

- **Specialty Care Facilities** serving Honolulu/Kakaʻako include (a) Shriners Hospitals for Children-Honolulu, a pediatric orthopedic hospital providing care for children with bone, joint, and neuromuscular conditions; (b) Kapiʻolani Medical Center for Women & Children, the state's only specialty care facility for women and children and only pediatric intensive care unit serving all islands and the Pacific Basin; and (c) The Rehabilitation Hospital of the Pacific, which provides rehabilitation services to patients with physical and cognitive disabilities.

- **Health Care Clinics** serving the area include the Waikīkī Health and Kalihi-Pālama Health Centers, both of which are federally qualified health centers (FQHCs). FQHCs are organizations receiving grants under Section 330 of the Public Health Service Act (PHS). They receive reimbursement from Medicare and Medicaid, and supply comprehensive health services to underserved areas or populations based on a sliding fee scale.

- **Other:** Honolulu is also served by various health care providers such as home health agencies and hospices (which mostly provide care in people's homes), physician practices, urgent care clinics, and dialysis and rehabilitation centers.

The Healthcare Association of Hawaiʻi (HAH)[17] and the State Health Planning & Development Agency (SHPDA) [18] both report that the health care system throughout Hawaiʻi – in urban Honolulu and elsewhere – was stressed by various factors:

1. The shutdown in 2011 of two Oʻahu hospitals (Hawaiʻi Medical Center East in Liliha and Hawaiʻi Medical Center West in ʻEwa). The closure of these hospitals, which employed 990 workers, eliminated more than 340 hospital beds. While ERs have been operating at capacity since these closures, the opening of The Queen's Medical

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[17] Telephone conversation between JMK Assoc. Staff and Rachael Wong, Vice President and COO of Healthcare Association of Hawaiʻi (HAH) on Dec. 11, 2013.

[18] Information received via email communications between JMK Assoc. Staff and State Health Planning & Development Agency Administrator, Sue Radcliffe in December 2013 and January 2014.

Center–West Oʻahu in May 2014 was expected to relieve some of the systemic pressure by providing health services to patients who live on the Leeward side closer to their homes. The experts consulted could not quantify the impact of its opening, but did believe it will relieve some of this stress.

2. The Great Recession, while technically ended, has left many without insurance. Because of this, emergency rooms and community health clinics feel greater pressure.

3. Changes in national healthcare system following the nation's health reform law enacted in March 2010 (i.e., the Affordable Care Act) is expected to increase patient demand for medical services. This could cause further stress on existing facilities.

None of these factors relate to population growth in any particular area, including Kakaʻako, but represent a challenge to the quality of health care both at present and also for the future growing population of Hawaiʻi in general.

4.10.6.2 Potential Impacts and Recommended Measures to Mitigate Them

Public Health – Emergency Services: The question for analysis here is what additional future needs, if any, the EMSD would face if the present Kakaʻako de facto population and jobcount were to grow by 2035 to the levels estimated in this EIS.

Future EMSD needs would of course depend on overall islandwide and metropolitan growth, as there is no official separate Kakaʻako EMSD service area. However, the EMSD estimates that growth under the Future Baseline Scenario would contribute to need for a second new EMS station. Based on the new station currently proposed for Kakaʻako, it would have annual operating costs of about $1.04 million (primarily for salaries). However, no additional service would thereafter be required for TOD Alternative A – or, logically, for the lower-density TOD Alternative B. Therefore, the impact as defined for this EIS would be $0, according to the agency.

Full build-out costs for the proposed new Kakaʻako EMS unit would be about $4 million, which provides the best estimate for construction costs for a possible second unit under the Future Baseline Scenario. However, no additional facility construction costs are envisioned for TOD Alternative A (and this in this analysis for TOD Alternative B as well).

EMSD notes that transport time to metropolitan hospitals are short from Kakaʻako. They would be mainly to Queens and Straub, and a little further to Kuakini. Kaiser Health Care plans will be transported to Moanalua Kaiser.

Medical Facilities: Whether population growth takes place in Kakaʻako or elsewhere on Oʻahu, the islandwide and statewide resilience of the health care system requires improvement. Population growth will otherwise continue to challenge the adequacy of health care throughout Hawaiʻi.

Because it cannot be currently estimated to what extent either TOD Alternative A or B will increase the population of the overall urban Honolulu on a net basis – i.e., because it

cannot be known how many people would be living in urban Honolulu outside Kakaʻako under the Future Baseline Scenario – it is difficult to estimate the impact on any current facility or on the network of facilities serving both Kakaʻako and the rest of urban Honolulu. No cost impacts can be calculated.

The redirection of some population growth into Kakaʻako is highly unlikely to result in any publicly funded facility construction costs in the area that would not occur anyway. At the moment, no such new construction is expected.

From the viewpoint of adequacy of services, the system is now stressed and has the potential to be further stressed by population growth, whether in Kakaʻako, other parts of urban Honolulu, or the rest of the island.

4.10.7 Education Facilities

4.10.7.1 Results of Analysis

The State Dept. of Education (DOE) most recent available estimates indicate there are now (Fall 2012) about 450 students with Kakaʻako addresses in various public elementary, middle, and high schools serving the area.[19] Five schools from two complexes (Kaimukī and McKinley Complexes) serve Kakaʻako and surrounding urban areas. These are Royal and Kaʻahumanu Elementary Schools, Central and Washington Middle Schools, and President William McKinley High School, with recent enrollment figures shown in Table 4-51 below. These are all public schools operated by the DOE. Voyager Public Charter School, the area's only charter school serving grades K-8, recently relocated out of the area. Although there are more than 100 private pre-schools serving the Honolulu area, only 12 public pre-schools operate in Honolulu, none of which are located in Kakaʻako. There have, however, been recent proposals to open two new (private) pre-schools in Kakaʻako, including a Seagull Schools and a Montessori School. [20]

The President William McKinley High School (aka McKinley High School) occupies 45.6 acres of land within the Thomas Square District neighborhood. The campus is significantly underdeveloped from a planning point of view and is capable of supporting a much larger educational facility. However, the potential expansion of the existing facilities is a decision that rests with the State Department of Education. Considerations include not only the potential ability of the campus to accommodate additional classrooms, e.g. an elementary school, middle school, or expanded high school, or some combination of the three, but also the future shared use of the playing fields for the benefit of the greater community.

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[19] This information and subsequent statements attributed to DOE derive from various communications (face-to-face, telephone, and written) between JMK Associates and personnel within the Planning Section, DOE Facilities Development Branch, October-November 2013.

[20] Pacific Business News. "Another school planned for Oahu's growing 'Third City' of Kakaʻako". Apr. 15, 2014. http://www.bizjournals.com/pacific/blog/2014/04/another-school-planned-for-oahus-growing-third.html

Table 4-51: Present and Recent Historic Enrollment in Schools Serving Kakaʻako

School	2006	2007	2008	2009	2010	2011	2012	2013
McKinley Complex								
Royal Elementary	385	373	313	330	351	364	352	376
Kaʻahumanu Elementary	573	566	566	582	583	560	573	597
Central Middle	466	457	407	407	394	371	334	351
McKinley High	1,877	1,857	1,809	1,789	1,782	1,790	1,757	1,677
Kaimukī Complex								
Washington Middle	1,048	1,032	897	856	817	840	817	794

Source: DOE Facilities Development Branch

DOE representatives have confirmed that Royal Elementary and Queen Kaʻahumanu Elementary are currently operating at near capacity and may not be able to accommodate large surges in enrollment in the future. While DOE projections anticipate negative growth for both of the elementary schools as well as for Central Middle school over the next five years (and hence increasing capacity for future growth), Royal School is expected to have the ability to provide space for fewer than 30 additional children by 2018 under present conditions. (See Table 4-52)

Table 4-52: Current and Near-Term Future Anticipated School Capacity

	School Capacity[a]	2013-2014 Residual Capacity[b]	2018-2019 Residual Capacity[c]
McKinley Complex			
Royal Elementary	368	-8	29
Kaʻahumanu Elementary	623	26	79
Central Middle	843	492	587
McKinley High	2,012	335	199
Kaimukī Complex			
Washington Middle	1,210	416	354

[a] Maximum Enrollment. Capacity assessed in 2012-2013 via DOE's "ARTS Classroom Space Survey"

[b] 2012-2013 ARTS Classroom Space Survey less actual 2013-2014 Enrollment

[c] 2012-2013 ARTS Classroom Space Survey less projected 2018 Enrollment

The official DOE policy[21] regarding enrollment guidelines for new schools lays out standard student enrollment ranges and land acreage needed to accommodate them. The DOE recommends that elementary schools (grades K-5) serve 400-750 students on 8 to 15 usable acres;[22] that middle schools (grades 6-8) serve 500-1,000 students on 15-20 usable acres; and that high schools (grades 9-12) serve 800-1,600 students on 45-55 usable acres. Future schools will likely have the maximal capacities.

With this policy in mind, the DOE uses residential unit counts, as well as current enrollment to set student generation rates for a particular area. In the urban Honolulu area including Kakaʻako, the DOE has set student generation rates at 0.082 students per multi-family dwelling unit for elementary schools; 0.033 students per multi family dwelling unit for middle schools; and 0.054 students per multi family dwelling unit for high schools.

When measuring the impact of the development of additional units in Kakaʻako over area school facilities, it cannot be assumed that all of the pressure placed on those schools will come from the Kakaʻako area alone. The five schools mentioned above serve not only Kakaʻako, but surrounding areas as well. In fact, service areas for middle and high schools in particular serve a *much* larger area than Kakaʻako alone. However, it is not possible to know for certain what the growth will be in the remainder of these various school service areas.

DOE is presently exploring the possibility that space could be made available for school facilities on the State-owned former Pohukaina School site, which has been proposed for the development of the 690 Pohukaina St. affordable housing project. The Pohukaina site is currently used for a State Library book-processing center. The library is slated to move to an ʻAiea location by the end of the 2013-2014 fiscal year. Pohukaina could be developed as a mixed-use project that includes an Elementary School.

4.10.7.2 Potential Impacts and Recommended Measures to Mitigate Them

The DOE has developed various location-specific multipliers for estimating future student counts generated by new developments, intended for use in eventual impact fee calculations. The multipliers for the urban Honolulu area including Kakaʻako are based on area-wide estimates, not current Kakaʻako student enrollments. If applied to current Kakaʻako dwelling units, they would generate an estimated student count far in excess of the actual present student count. Use of these multipliers is thus likely conservative, in that they produce estimated future enrollments more substantial than might be derived from an extrapolation of present Kakaʻako conditions.

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21 State of Hawaii Board of Education. BOE Policies. 6000 Series. 6701. https://lilinote.k12.hi.us/STATE/BOE/POL1.NSF/85255a0a0010ae82852555340060479d/b31a0aa2c2ca52b10a2566a30082892f?OpenDocument

22 According to DOE, "Useable is generally defined as land free of encumbrances determined to be unnecessary by the department of education, slope of five percent or less, with no ravines or stream beds".

Based on these DOE multipliers, the number of students from Kakaʻako will increase significantly for build-out under the Future Baseline Scenario and even more for build-out under the Proposed Action (see Table 4-53).

Table 4-53: Impact on Students Served

	DOE Student Generation Rates (Per Unit)	Future Baseline Scenario[a]	TOD Alternative B[b]		TOD Alternative A[c]	
		# Students	# Students	Impact (Difference)	# Students	Impact (Difference)
Elementary	0.082	1,734	2,180	446	2,375	641
Middle	0.033	698	877	180	956	258
High	0.054	1,142	1,436	294	1,564	422
Total:		**3,574**	**4,493**	**920**	**4,896**	**1,322**

[a] Generation rate times dwelling units for build-out under Future Baseline, estimated to reach 21,146
[b] Generation rate times dwelling units for build-out under TOD Alternative B, estimated to be 26,588
[c] Generation rate times dwelling units for build-out under TOD Alternative A, estimated to be 28,968

The following operational cost estimate (Table 4-54) is based on the most recent overall DOE operating budget divided by total enrollment:

Table 4-54: Impact on Operational Costs

	Change in Students	Average Per-Student Cost[a]	Total Annual Impact
TOD Alternative B	920	$11,854	$10,903,680
TOD Alternative A	1,322	$11,854	$15,670,015

[a] State of Hawaii DOE Financial Report. Office of Fiscal Services. July 1, 2010- June 30, 2011. http://www.hawaiipublicschools.org/DOE%20Forms/State%20Reports/FinancialReport2010-2011.pdf. Updated to 2012 dollars using Honolulu CPI.

It is to be remembered that both these expenditures and the change in student counts are expected to occur elsewhere on the island in any event – the "impact" is a *shift* or concentration into Kakaʻako.

The student count figures in Table 4-54, when divided by maximum DOE school enrollments (considered appropriate by DOE Facilities Branch to use when considering future urban school sites) yield the following percentage equivalents of new schools needed at each level for various planning scenarios (see Table 4-55) – *if* school district lines were redrawn such that Kakaʻako alone were to be the primary service area for schools:

Table 4-55: Kakaʻako Schools Needed Under Various Scenarios

	Maximum Capacity for Schools	Future Baseline	TOD Alternative B		TOD Alternative A	
			Need	Impact (Difference)	Need	Impact (Difference)
Elementary	750	231%	291%	60%	317%	86%
Middle	1,000	70%	88%	18%	96%	26%
High	1,600	71%	90%	18%	98%	26%

Illustrative Explanation: Previously calculated Future Baseline student count of 1,734 elementary school students is equivalent to 2.31 times the number of students in one elementary school.

The data in the table above suggests that, under TOD Alternative A, build-out would generate enough students from Kakaʻako alone to fill more than three elementary schools and almost enough to fill one middle and one high school. Compared to build-out under the Future Baseline Condition, that is almost the equivalent of one additional one elementary school and fractions (about one-quarter each) of additional middle and high schools. For the lower-density TOD Alternative B, the impact numbers are equivalent to 60% of one elementary school and nearly one-fifth of additional middle and high schools.

However, because Kakaʻako is part of a larger DOE service area (particularly for middle and high schools), it is difficult to predict for certain at what point the need for any one particular new school would be generated – as that depends in part on growth in adjacent areas as well. That is, it is difficult to say to what extent actual DOE construction costs in future would depend just on Kakaʻako population growth.

The standard DOE approach – utilized in this analysis for costing purposes – instead uses *average* construction and land cost multipliers per dwelling unit, for various parts of the island. Table 4-56 uses DOE-supplied multipliers for urban Honolulu. It suggests that DOE would have to spend a little under $123 million more for construction and land costs under TOD Alternative B, and $176 million more under Alternative A, than under the Future Baseline Condition.

Table 4-56: Additional Kakaʻako-Specific School Facility Costs (DOE Multipliers)

FUTURE BASELINE ALTERNATIVE	Construction Cost	Land Cost	Combined Cost
Total Increase over Existing Units	*12,528*	*12,528*	*12,528*
Elementary[a]	$34,739,336	$62,312,823	**$97,052,159**
Middle[b]	$17,501,209	$18,465,843	**$35,967,051**
High[c]	$44,999,529	$104,305,702	**$149,305,231**
Total:	**$97,240,074**	**$185,084,367**	**$282,324,442**
TOD ALTERNATIVE B	**Construction Cost**	**Land Cost**	**Combined Cost**
Total Increase over Existing Units	*17,970*	*17,970*	*17,970*
Elementary[a]	$49,832,106	$89,385,105	**$139,217,212**
Middle[b]	$25,104,743	$26,488,469	**$51,593,212**
High[c]	$64,549,919	$149,622,113	**$214,172,032**
Total:	**$139,486,769**	**$265,495,687**	**$404,982,456**
IMPACT (DIFFERENCE)	**Construction Cost**	**Land Cost**	**Combined Cost**
Change in Units over Future Baseline	*5,443*	*5,443*	*5,443*
Elementary[a]	$15,092,770	$27,072,283	**$42,165,053**
Middle[b]	$7,603,534	$8,022,627	**$15,626,161**
High[c]	$19,550,390	$45,316,411	**$64,866,801**
Total:	**$42,246,695**	**$80,411,320**	**$122,658,014**
TOD ALTERNATIVE A	**Construction Cost**	**Land Cost**	**Combined Cost**
Total Increase over Existing Units	*20,350*	*20,350*	*20,350*
Elementary[a]	$56,429,621	$101,219,234	**$157,648,855**
Middle[b]	$28,428,482	$29,995,406	**$58,423,888**
High[c]	$73,095,997	$169,431,311	**$242,527,308**
Total:	**$157,954,100**	**$300,645,952**	**$458,600,052**
IMPACT (DIFFERENCE)	**Construction Cost**	**Land Cost**	**Combined Cost**
Change in Units over Future Baseline	*8,817*	*8,817*	*8,817*
Elementary[a]	$21,690,285	$38,906,411	**$60,596,697**
Middle[b]	$10,927,273	$11,529,564	**$22,456,837**
High[c]	$28,096,468	$65,125,609	**$93,222,077**
Total:	**$60,714,026**	**$115,561,584**	**$176,275,610**

[a] Elementary construction and land multipliers:	$2,773	$4,974	**Source for Multi-pliers:** Hawaii State DOE
[b] Middle school construction and land multipliers:	$1,397	$1,474	
[c] High School construction and land multipliers:	$3,592	$8,326	

Again, however, it should be remembered this means the DOE would need to spend this money in Kakaʻako rather than elsewhere on the island, as both alternatives are about redirecting population to Kakaʻako. Additionally, these Kakaʻako-specific facility costs, as well as all preceding Kakaʻako-specific impact numbers, are likely somewhat overstated because some of the additional units (and their student counts) estimated to be developed at build-out of each alternative and could, under the Future Baseline Condition, instead still be developed in the same DOE school service areas near to Kakaʻako. Thus**, similar DOE calculations would apply to growth wherever it occurs on Oʻahu.**

Probably the most important actual consequence of Kakaʻako population growth for school development is the need to find land for new schools. This is an issue facing DOE in all areas now being planned or considered for higher-density TOD uses along the south shore of O`ahu. DOE has yet to initiate any comprehensive analyses to identify potential sites in Kakaʻako or other TOD areas, and has not conducted any in Kakaʻako for at least the past decade. However, there are no currently known candidate sites in Kakaʻako itself. A further constraint in Kakaʻako is that the Makai area (below Ala Moana Blvd.) is ruled out for DOE use because this area is largely in the potential tsunami inundation zone.

It is no more certain that additional candidate sites could be identified close to Kakaʻako than in Kakaʻako itself. However, if such a solution were to be found feasible – i.e., continuing to send Kakaʻako students to schools bordering the area, as is now the case – this could arguably affect the sense of community within greater Kakaʻako or its constituent neighborhoods. DOE notes there are still reunions of students who attended the former Pohukaina Elementary School during the 1930s.

According to DOE:

> As late as December 2011, the DOE was operating with the understanding that space would be made available for a school facility within whatever development project took place on the former Pohukaina School site.
>
> Per HRS302A-1601 the DOE is authorized to collect land and money from developers of residential housing through the imposition of impact fees. The fee formula is set in law and is heavily weighted towards providing the land (or cost of land) needed for new schools with just a 10% contribution toward construction costs. (The legislative intent was that the balance of construction funds would come from state funds.) To date, the formula has been used principally on suburban-style projects with large undeveloped acreage.
>
> The formula has not yet been applied in high-density urban areas, where there is limited land and the cost of the land is much higher. Because of the cost of land associated with urban development, it is expected that the impact fee formula would yield a higher per unit cost in developing urban areas such as Kaka'ako.

The impact fee formula, as stated in law, assumes that a new residential project will have an impact on student enrollment at elementary, middle and high schools. In Kaka'ako, there is an unusual situation of insufficient space in the elementary schools that serve the area, but currently significant capacity in the middle schools and some limited additional space in the high school. It is unclear at this point if a legal interpretation of the impact fee law would permit application of only those portions of the formula that are needed (i.e. fees charged based on providing elementary school capacity only).

The DOE would need to determine if this exception would be possible and then what the scenario might be should future capacity be required in middle and high schools if Kaka'ako continued to develop.

As noted earlier, DOE is presently exploring the possibility that space could be made available for school facilities on the State-owned former Pohukaina School site, which has been proposed for the development of the 690 Pohukaina St. affordable housing project. Pohukaina could be developed as a mixed-use project that includes an Elementary School.

4.10.8 Public Emergencies and First Responders

4.10.8.1 Results of Analysis

Kakaʻako is currently served by the Kakaʻako Fire Station (located in the western or ʻEwa portion of Kakaʻako at 555 Queen St.) and the Pāwaʻa Fire Station (located at 1610 Makaloa St, just past the eastern or Diamond Head district boundary of the Kakaʻako Community Development District). Both stations were built more than 40 years ago, and would eventually require replacement due to age alone.

The Honolulu Police Dept. (HPD) currently has no police facility in Kakaʻako, though the island's Main Station on South Beretania St. is just above Kakaʻako's mauka boundary (S. King St.). Kakaʻako is part of HPD's District 1, Central Honolulu, which includes the downtown Honolulu area from Liliha Street to Punahou Street and from Round Top Drive to Ala Moana Beach Park, including the Aloha Tower.

4.10.8.2 Potential Impacts and Recommended Measures to Mitigate Them

Fire: The projected Kakaʻako residential population growth under the Future Baseline Scenario would, at full build-out, require an increase of ten on-duty fire-fighters (FFs) (or 30 FFs to cover all shifts), two support staff, and two fire trucks. Twice those numbers (i.e., 60 FFs, four support staff, etc.) would need to be added for TOD Alternative A, with the same needs conservatively assumed for the somewhat lower density TOD Alternative B. Thus, the Kakaʻako-specific impact of either TOD Alternative A or B would be annual operating costs associated with the difference in these numbers – which amount to 30 FFs, two support staff, and two fire trucks.

With a current average HFD staff salary a little under $82,000, the average annual personnel cost for each TOD Alternative (A and B) would be about $2.6 million (for the additional 32 positions). One-time purchase costs for fire trucks would be about $500,000 each, or $1 million total.

While the current fire stations will eventually need to be replaced even if there is zero population growth in their service areas, expanded future Kakaʻako populations (and attendant needs for more FFs and equipment) under the various scenarios would necessitate larger and thus more costly replacement structures.

HFD estimates the additional construction cost for each station – over and above replacement costs for stations of the current size – would be in the range of $8 to $10 million. One expanded station would be needed to house the additional FFs and fire trucks under the Future Baseline Condition, and a second expanded station would be needed under each of the TOD Alternatives. Thus, the one-time facility cost impact of the TOD Alternatives (either A or B) would be the $8 to $10 million construction increment for a second station, which will be conservatively operationalized as a single higher-end $9.5 million for purposes of subsequent fiscal cost-revenue analysis. (Including fire trucks, one-time costs are $10.5 million.)

In response to our inquiry, the Honolulu Fire Dept. (HFD)[23] states that HFD's "ability to provide services in Kakaʻako will also be impacted by transit-oriented development, including rail infrastructure, traffic calming, and pedestrian friendly street features, and the potential increase in vertical height of the area's buildings." HFD was, however, unable to quantify such impacts. Regarding slower response times for fires at the top of tall buildings, these would depend on various building-specific factors – such as availability to firefighters of various numbers of elevator banks or stairwells, presence of an auxiliary water supply above 400 feet, layout of floors, and other parameters. (Note that difficulties associated with the provision of water above 400 feet would be associated only with TOD Alternative A and not TOD Alternative B.)

Police: According to the HPD,[24] the projected Kakaʻako residential population growth under the Future Baseline Scenario would, at full build-out, require an increase of about 31 police officers, based on the December 2012 ratio of 8.9 police officers per 10,000 people in District 1. There would also be additional costs at the main station – e.g., equipment, supplies, vehicles, etc., though some of these would of course also be required if the projected population increase occurred elsewhere in District 1 or other places supported by the main station. While the salary range for a City and County police officer currently is between $4,439 to $6,392 per month, HPD concurred with an *augmented* average salary estimate from JMK Associates of $8,000 per month ($96,000 annually) in

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23 Letter of Sept. 20, 2013 from HFD Chief Manuel P. Neves and various follow-up discussions with Battalion Chief Socrates Bratakos of the Fire Prevention Bureau.

24 Letter of Sept. 13, from Asst. Chief Clayton G. Kau (for Chief Louis M. Kealoha), and various follow-up communications with Research Analyst Emily Ogasawara.

order to include appropriate portions of the supplemental costs. This results in an estimated average annual operating cost impact of $2.976 million at full build-out under the Future Baseline Scenario.

Under TOD Alternative B, the ratio of 8.9 police officers applied to the de facto population at full build-out would generate a total demand for nearly 40 police officers – and, at $96,000/year for salaries and support, a total operating cost increase of $3.8 million. The impact, or difference in figures between the two scenarios, would thus be about 9.45 more police officers and $907,500 additional personnel costs per year.

Under the higher-density TOD Alternative A, this same ratio would generate a total demand for 43 police officers – and, a total operating cost increase of $4.12 million. The impact, or difference in figures between the two scenarios, would thus be nearly 13 more police officers and $1.23 million additional operating costs per year.

Additionally, under TOD Alternative A, the HPD would need to rent space for a small field and report writing office in which officers can complete reports, miscellaneous office-type duties, and other tasks. Discussions between JMK Associates and HPD officials generated an assumed rental cost of $30,000/year ($2,500/month). The same figure may be conservatively applied to TOD Alternative B.

HPD envisioned no construction of new police facilities for TOD Alternative A. Therefore none are envisioned in this analysis for the lower-density Alternative B either.

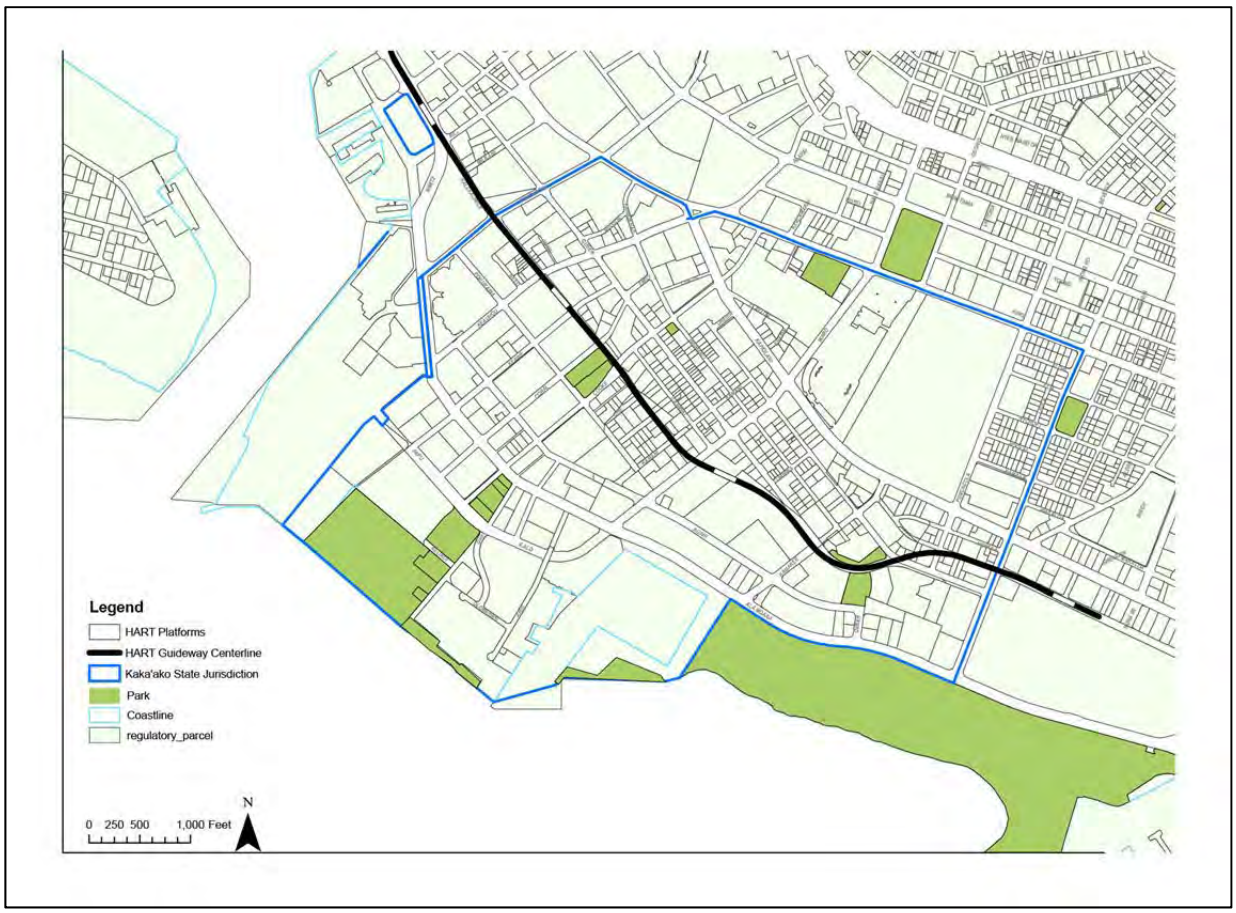
Although the rail stations in or near Kakaʻako would be constructed with or without the Proposed Action, HPD wished to emphasize its estimate that the overall transit project, regardless of population implications, would require an additional 251 employees of various kinds, with annual cost of about $17.3 million.

4.10.9 Recreational Facilities

4.10.9.1 Results of Analysis

There are currently seven (7) public parks in Kakaʻako occupying nearly 54 acres of land (see Table 4-57). Both the Mother Waldron Neighborhood Park and the Kawaiahaʻo Street Mini Park are managed by the City and County of Honolulu's Department of Parks and Recreation (DPR), while the rest are managed by HCDA. No Kakaʻako parks are managed by the State Parks Division of the Dept. of Land and Natural Resources. Private recreational facilities associated with particular buildings provide another 16 acres in the area (see following table). In addition, DPR's Ala Moana Regional Park abuts the District on the east and serves as a regional park for greater Honolulu. Historic Thomas Square abuts the district on the north. See Figure 4-27.

Figure 4-27: Distribution of Parks, Open Space, and Greenways in the KCDD



Current HCDA rules require that 55 SF of recreational space be allocated per dwelling unit developed in Kakaʻako. The City and County of Honolulu standards call for 110 SF of green space[25] per dwelling unit for any high-rise multi-family or town house development anywhere on the island. While under these City standards, the provision of green areas within Kakaʻako has currently been met, it should be noted that the Mauka Area Rules (HAR Chapter 22 §15-217-8) state that "Recreational space" means an outdoors or indoors open space within a development that can be located at any level and is available for recreational use. It is hence limited not only to green space, parks, or playgrounds, but can also include parking areas. In discussions for this EIS, DPR expressed concerns regarding the current inventory of parks and adequacy of their uses in the area.[26] It said the need in Kakaʻako is not for small private parks sprinkled throughout the region (primarily *passive* uses), but for larger regional *active* green spaces with potential to provide sports fields.

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25 According to the City and County Land Use Ordinance (Chapter 22 §22-7.5), this requirement is to land area specifically dedicated for parks and playgrounds.

26 Information attributed to DPR is derived from various communications (telephone and written) between JMK Associates and John Reid, staff planner within the City and County of Honolulu's Department of Parks Recreation, November-December 2013.

Table 4-57: Public and Private Recreational Facilities in Kakaʻako

Public Recreation	Agency/Mgmt.	Acres
Mother Waldron Neighborhood Park	City DPR	2.73
Kolowalu Park [a]	State HCDA	2.57
Restaurant Row Park	State HCDA	1.79
Kawaiahaʻo Street Mini Park	City DPR	0.2
Kakaʻako Gateway	State HCDA	2.2
Kakaʻako Waterfront Park [b]	State HCDA	38.9
Kewalo Basin Park	State HCDA	5.2
Total:		**53.59**
Private Recreation	**Agency/Mgmt.**	**Acres**
One Waterfront Plaza and Towers	Private	0.77
Pacific Park Plaza	Private	0.94
404 Piʻikoi	Private	4.98
Imperial Plaza	Private	0.44
Kamakee Vista	Private	0.53
Pohulani	Private	0.95
Kauhale Kakaʻako	Private	0.68
Na Lei Hulu Kūpuna	Private	0.07
Honuakaha	Private	0.39
One Archer Lane	Private	0.44
Hokua	Private	1.89
Moana Pacific	Private	2.17
909 Kapiʻolani	Private	0.47
Keola Lai	Private	0.46
Pacifica	Private	0.62
680 Ala Moana	Private	0.29
Total:		**16.09**

[a] Kolowalu Park (sometimes referred to as Queen Street Park) was developed by HCDA with thoughts to possibly convey it to DPR upon legislative approval. However this has been delayed because of issues with encroachment of adjacent buildings on the park site.

[b] Park-zone land, including Look Lab site

Source: HCDA. 2014. http://dbedt.hawaii.gov/hcda/files/2014/04/kcdd-park-and-private-recreation-space-032714.pdf

While Kakaʻako Waterfront Park offers passive recreational uses (such as picnicking, strolling, and jogging), its terrain is too hilly to provide suitable outdoor space for baseball, lacrosse, and other active team sports. The limited availability of land in Kakaʻako will not allow for another regional park to be built.

However, it is HCDA's position that the nearby Ala Moana Regional Park is sufficient to meet the future needs of Kakaʻako's growing population. HCDA also recognizes that private landowners may be interested in providing active recreational space in new developments to accommodate fitness centers or health clubs to supplement existing parks. Contemporary facilities such as these do not rely upon the availability of large open grassed areas.

The privately funded Kroc Center in East Kapolei has been immensely successful and offers a good example of a non-traditional active recreational facility.
(see: http://www.kroccenterhawaii.org)

The 200,000 square foot two-story building includes the following:

- A 500-seat Performing Arts Center (also used as the Chapel);
- A multi-use indoor Gymnasium (with three basketball courts);
- A Fitness Center with several hundred exercise machines;
- A Preschool facility;
- A 7,500 square foot Conference Center with banquet capabilities;
- A 48-bed Dormitory for traveling sport teams; and
- Several Classrooms (for the Arts Center program)

4.10.9.2 Potential Impacts and Recommended Measures to Mitigate Them

Neither the HCDA (the primary provider of parks and recreational facilities in Kakaʻako) nor the City DPR currently plans to construct additional parks in or near Kakaʻako, suggesting that impacts on existing public facilities will be confined to those listed at the start of the above Table, and other nearby regional facilities. However, HCDA plans to develop a Parks Master Plan that would thoroughly study needs and best ways to meet them. Until such a study is completed, recreational impacts remain an "Unresolved Issue." Nevertheless, an obvious provisional conclusion is that there is potential for congestion at area public parks and a limited supply to meet public demand within Kakaʻako – particularly in regard to sports fields and playgrounds, a recreational need that has historically not yet been met by requirements for developer contributions.

It is also difficult under present conditions to quantify financial impacts on affected agencies for operations. Even if no new public facilities are provided, as per current plans, HCDA believes that population growth in Kakaʻako would result in need for additional parks personnel but would little impact any other portion of the budget. Under such conditions, the need for additional maintenance personnel would likely be marginal rather than directly proportional to area population growth – i.e., even if three times as

many people live or stay in Kakaʻako in the future as do today, and no new parks are provided, that would not mean that current parks would require three times the number of maintenance workers. However, HCDA has no way to estimate the required number of additional workers, and JMK Associates could find no reasonable basis for estimates of its own.

Similarly, DPR staff had no estimates of financial impacts on future operational costs (for either the Future Baseline Scenario or the Proposed Action) for their current two small Kakaʻako parks. DPR believes that – unless the proposed Kakaʻako Parks Master Plan leads to development of more active public or private recreational facilities – the greater impact of Kakaʻako population growth on public facilities would be increased pressure on nearby Ala Moana Regional Park. Again, DPR had no estimates of cost impacts for either future growth scenario, nor could JMK Associates determine its own basis for estimating cost implications.

As previously stated, no additional public parks are planned under either the Future Baseline or either of the TOD Alternatives. Therefore, the current estimated publicly funded park facility cost impact is $0. Again, though, the social impacts of overcrowded parks and/or lack of active sports facilities could be significant.

As a result of a public-private partnership with local developer Stanford Carr Development, LLC. (SCD), improvements at the Mother Waldron Neighborhood Park were recently completed (Sept. 2014). The restoration (funded from unutilized private funds from a nearby SCD development) includes a new basketball court and playground, as well as new landscaping and trees, and the restoration of the comfort station and pavilion.

In their conceptual planning process, HCDA planners have noted that future redevelopment of the Neil S. Blaisdell Center by its owner, the City and County of Honolulu, could accommodate a sizeable open space area that could be used for park purposes.

Private recreational space, or at least open space, will be built according to HCDA's current standards of 55 SF of green space per one dwelling unit constructed. Private developers will be responsible for managing their own green space. Green space allocation per dwelling unit under these standards is presented here under the Future Baseline Scenario and will be provided within the two proposed TOD Alternatives (A and B):

- 12,528 additional units under current Rules – i.e., the Future Baseline Condition – times 55 SF equals 689,024 additional SF of green space (about 16 acres).

- Above and beyond the Future Baseline Condition, build-out of TOD Alternative B would create a further 5,513 units and demand for another 303,228 SF of green space (about 7.0 more acres). This difference is the impact for Alternative B.

- Above and beyond the Future Baseline Condition, build-out of TOD Alternative A would create a further 7,892 units and demand for another 434,084 SF of green space (about 10.0 more acres). This difference is the impact for Alternative A.

More than eight acres of public outdoor recreational space have been proposed in the already approved Howard Hughes Corp.[27] and Kamehameha Schools Master Plans[28] (Table 4-58) representing a substantial but still partial response to the total demand, according to the above standards and calculations for the total additional 16 acres under the Future Baseline Condition, 23 acres under TOD Alternative B, and 26 acres under TOD Alternative A.

Table 4- 58: Proposed Public Outdoor Recreation Space

Proposed Public Outdoor Recreation Space from Ward (Howard Hughes) and KS Master Plans	Acres
Ward Neighborhood Central Plaza	3.44
Ward Neighborhood Ewa Plaza	1.00
Ward Neighborhood Diamondhead Plaza	1.00
Park to Park Connection on Cooke Street	2.02
Auahi Street Community Gathering Place	0.57
Total:	**8.04**

4.10.10 Public Infrastructure

4.10.10.1 Kaka`ako

Public infrastructure costs for the Future Baseline Condition are found in past HCDA studies cited in Table 4-59, which also shows updated dollar values and a few adjustments explained below.

City Transportation-Related Costs: Table 4-60 presents the public infrastructure costs for the TOD Alternatives. For TOD Alternative A (subsequently attributed to Alternative B as well), the traffic study (Appendix D) estimates total transportation-related "mitigation" costs would be some $14,433,000 in 2015 dollars (roughly $13,331,000 in 2012 dollars). However, most of these consist of required pedestrian improvements that will likely be passed on to developers. The traffic study suggests that bicycle-related improvements are most likely to be funded by the City Department of Transportation Services (with no cost to the State), as well as the proposed Ala Moana Boulevard "Share Use Path" for pedestrians. Thus, the total transportation improvements are estimated to total approximately $3,178,000 in 2015 dollars (roughly $2,935,301 in 2012 dollars).

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27 Howard Hughes Corp. *A Vision For Ward*. http://www.avisionforward.com/

28 Kamehameha Schools Kakaʻako Website. http://www.ourkakaako.com/

Table 4-59: Public Infrastructure Costs for Future Baseline Condition

Mauka[a]	Amount in 2008 Dollars	Amount in 2012 Dollars[d]	2014 Adjustments[e]
Sewer	$49,482,000	$53,938,733	$3,253,120
Water	$5,140,000	$5,602,948	$46,978,873
Water Main Replacement	$249,800	$272,299	
Storm Drain	$6,666,000	$7,266,392	$7,266,392
Street Improvements	$20,780,000	$22,651,608	$22,651,608
Traffic Signalization	$600,000	$654,041	$654,041
Street Lighting	$5,140,000	$5,602,948	$5,602,948
Pavement Patching Repair	$2,538,990	$2,538,990	$2,538,990
Mauka Sub-Total	**$90,596,790**	**$98,527,960**	**$88,945,972**
Makai[b]	**Amount in 2005 Dollars**	**Amount in 2012 Dollars[d]**	**2014 Adjustments[e]**
Water Supply	$1,470,000	$1,854,028	$1,854,028
Waste Water	$2,880,000	$3,632,382	$3,632,382
Roads	$10,520,000	$13,268,284	$13,268,284
Traffic Signals[c]	$87,090	$109,842	$109,842
Street Lighting[c]	$746,110	$941,027	$941,027
Design Fees	$3,400,000	$4,288,229	$4,288,229
Makai Sub-Total	**$19,103,200**	**$24,093,790**	**$24,093,790**
Total Kaka'ako	**$109,699,990**	**$122,621,750**	**$113,039,762**

[a] M&E Pacific, Inc. 2009. "Kakaako Community Development District Mauka Area Infrastructure Plan." Appendix E, Vol. III, *Final Supplemental Environmental Impact Statement, Draft Mauka Area Plan.* Prepared by EDAW, Inc. for HCDA. Pp. 16-1 to 16-10. Also contains cost estimates for Electrical, Telephone, and Cable TV not included here because not taxpayer-funded, but used to estimate some Makai costs.

[b] HCDA. 2005. *Kakaako Community Development District Makai Area Development Plan.* P. 43. Original showed a total (no breakdown) 2005 figure of $8.6M in (2005 $s) for "Power, Communications, Street Lighting, Traffic Controls."

[c] Separate costs for these items estimated from the original $8.6M by percentages of similar total in 2009 Mauka Area Infrastructure Plan above.

[d] Calculated by JMK Associates, Inc., using Honolulu Consumer Price Index (CPI).

[e] 2014 Adjustments (in gray-shaded cells) provided by Belt Collins Hawai'i based on consultations with City agencies, and converted to 2012 $s by JMK Associates, using Honolulu CPI. Large differences between 2009 EIS and 2014 adjustments for Water and, particularly, Sewer are explained in Belt Collins report for this EIS.

Table 4-60: Summary, Kaka`ako-Specific Cost Impacts of TOD Alternative B

	One-Time Construction, Equipment		Annual Operations	
	Nature of Cost	Amount	Nature of Cost	Amount
FACILITIES				
City and County of Honolulu Agencies				
Fire Department	Second fire station, 2 trucks	$10,500,000	Additional Personnel	$2,618,240
Police Department	(None)	$0	- Additional Personnel	$907,472
			- Field Office Rent	$30,000
Emergency Services	(None)	$0	(None)	$0
Public Health[a]	(None, mostly private services)	$0	(None)	$0
Parks & Recreation[a]		$0	(None)	$0
Total Facilities Cost:		**$10,500,000**	**Total Operations Cost:**	**$3,555,712 (annually)**
Associated Direct Construction Job-Year Impact:		**35**		
State of Hawaii Agencies				
Dept. of Education	Share of New Schools	$122,658,014	Personnel, other support	$10,903,680
HCDA, DLNR Parks	(None)	$0	(None)	$0
Total Facilities Cost:		**$122,658,014**	**Total Operations Cost:**	**$10,903,680 (annually)**
Associated Direct Construction Job-Year Impact:[b]		**155**		
INFRASTRUCTURE			**Note: Construction job numbers in this table add up to sum shown in Table 4-49, final column for "Infrastructure and Public Facilities."**	
City and County of Honolulu Agencies				
Transportation Services	Transportation Improvements	$2,935,301		
Bd. of Water Supply	Water System	$0		
Environmental Services	Wastewater System	$1,052,480		
Total Infrastructure Cost:		**$3,987,780**		
Associated Direct Construction Job-Year Impact:		**24**		
State of Hawaii Agencies				
(None affected)[a]	(None)	$0		
Total Infrastructure Cost:		**$0**		
Associated Direct Construction Job-Year Impact:		**0**		

[a] Despite lack of currently identifiable costs, broad issues about adequacy of health and recreational services – at both City and State levels – were raised by some agency interviewees. Park costs considered Unresolved Issue.
[b] Though DOE cost figures here include Land Acquisition, job estimates based on Construction costs only.

Table 4-61: Summary, Kaka`ako-Specific Cost Impacts of TOD Alternative A

	One-Time Construction, Equipment		Annual Operations	
	Nature of Cost	Amount	Nature of Cost	Amount
FACILITIES				
City and County of Honolulu Agencies				
Fire Department	Second fire station, 2 trucks	$10,500,000	Additional Personnel	$2,618,240
Police Department	(None)	$0	- Additional Personnel	$1,228,529
			- Field Office Rent	$30,000
Emergency Services	(None)	$0	(None)	$0
Public Health[a]	(None, mostly private services)	$0	(None)	$0
Parks & Recreation[a]		$0	(None)	$0
Total Facilities Cost:		**$10,500,000**	**Total Operations Cost:**	**$3,876,769 (annually)**
Associated Direct Construction Job-Year Impact:		**35**		
State of Hawaii Agencies				
Dept. of Education	Share of New Schools	$176,275,610	Personnel, other support	$15,670,015
HCDA, DLNR Parks	(None)	$0	(None)	$0
Total Facilities Cost:		**$176,275,610**	**Total Operations Cost:**	**$15,670,015 (annually)**
Associated Direct Construction Job-Year Impact:[b]		**222**		
INFRASTRUCTURE			**Note: Construction job numbers in this table add up to sum shown in Table 4-49, final column for "Infrastructure and Public Facilities."**	
City and County of Honolulu Agencies				
Transportation Services	Transportation Improvements	$2,935,301		
Bd. of Water Supply	Water System	$0		
Environmental Services	Wastewater System	$1,052,480		
Total Infrastructure Cost:		**$3,987,780**		
Associated Direct Construction Job-Year Impact:		**24**		
State of Hawaii Agencies				
(None affected)[a]	(None)	$0		
Total Infrastructure Cost:		**$0**		
Associated Direct Construction Job-Year Impact:		**0**		

[a] Despite lack of currently identifiable costs, broad issues about adequacy of health and recreational services – at both City and State levels – were raised by some agency interviewees. Park costs considered Unresolved Issue.
[b] Though DOE cost figures here include Land Acquisition, job estimates based on Construction costs only.

Water and Sewer (Wastewater): Based on discussions with City agencies, Table 4-59 presents the adjusted Future Baseline figures. The estimated additional infrastructure costs for each of the two TOD Alternatives proved identical. These estimated costs (all adjusted to 2012 dollars) are shown in the following summary for Alternative B (Table 4-60) and Table 4-61 for Alternative A. These tables also identify direct construction job-years associated with Kakaʻako-specific facility/ infrastructure impacts.

Again, many of these costs will be incurred wherever else on Oʻahu (outside Kakaʻako) that future growth in population and/or economic activity would occur under the Future Baseline Condition. The following Section considers the net islandwide public costs attributable just to the growth-*inducing* aspects of the TOD Alternatives, as opposed to the growth-*capturing* aspects primarily analyzed here.

4.10.10.2 Islandwide Public Facility Impacts

This section begins a transition in this report to studying the *net islandwide impacts* of the TOD Alternatives (A or B). These effects are less than the Kakaʻako-specific impacts, because incremental residential population growth in Kakaʻako resulting from the TOD Alternatives would likely occur somewhere on the island under either TOD Alternative A or Alternative B.

The primary component of either TOD Alternative considered to be "net new islandwide impacts" would be the three hotels, along with the visitor population and associated islandwide employment and dependents of employees supported by visitor expenditures. Associated public costs set forth here are also islandwide impacts. As will be established in the following Section, the combined resident and visitor de facto islandwide population impact is estimated for TOD Alternative A as 7,423 average daily population (2,364 new Kakaʻako hotel guests or part-time residents, with the rest comprised of worker households distributed throughout the island). For TOD Alternative B, the comparable figures are 6,768 total (including 2,106 hotel guests or part-time residents). These are conservative numbers for establishing islandwide public service impacts, because they assume that residential workers and dependents represent entirely new or "created" population – in reality, some of the residential population might already be on-island but simply "maintained" by expanded employment opportunities.

All statements in this section flow from the same agency sources and procedures described above for Kakaʻako-specific impacts. A more concise format is possible because the Future Baseline Condition need not be addressed. It involves zero hotels and a fixed base level of part-time visitors. Impacts on public services and facilities can be directly derived from the dwelling unit or population impacts of each TOD Alternative (calculated in the following Section), and these would be dispersed islandwide.

Public Safety – Fire Department: For TOD Alternative A, according to the HFD, the additional net islandwide population would generate a need for three additional on-duty firefighters (nine total, to cover all shifts), one support staff, and probably no new equipment. At current average salaries, the annual additional personnel cost would be a

little under $820,000. The same Operational impact is conservatively assumed for TOD Alternative B

For both TOD Alternatives, no Facility Construction Impacts for the Fire Department are anticipated due to the limited operational impacts described above. It should of course be acknowledged – for all public agencies discussed in this section – that small population increases from any one project contribute over time to new facility and infrastructure needs, but it may still be correctly stated that the Proposed Action will have a negligible effect on such demand.

Public Safety – Police Department: Applying the previously described ratio of 8.9 officers per 10,000 de facto population (with average cost of $96,000 each for salaries plus support costs) to the projected de facto populations calculated in the following Section, the net islandwide Operational Impact at full build-out would be about 6.0 additional police offers and $578,000 additional personnel costs annually for TOD Alternative B. For TOD Alternative A, it would be about 6.6 additional officers and $634,000 additional personnel cost annually.

With regard to Construction Impacts for the Police Department, HPD does not project any facility construction need due to islandwide impacts of TOD Alternative A, and the slightly lower-impact TOD Alternative B would logically not create any facility construction needs either.

Public Health – Emergency Services: According to City budget documents, the total actual FY2012 EMSD budget was $24,181,985. Dividing this number by the 2012 de facto population of 1,019,156 yields a per-capita service cost of $23.73. For TOD Alternative B, that number multiplied by the de facto population increase of 6,768 produces about $161,000 in 2012 dollars. For Alternative A, $23.73 multiplied by a de facto population increase of 7,423 generates an annual Operational Impact of about $176,000 in 2012 dollars. Again, this difference in estimates is not meaningful in any practical terms.

Given the relatively small islandwide population increase, Construction Impacts for Emergency Services would be zero for either of the proposed Alternatives.

Public Health – Hospitals and Health Care Facilities: As discussed previously, the overall Hawaiʻi health care system is currently stressed due to a number of factors. Any resident or visitor population growth at all will definitely add to that stress. However, the net islandwide growth attributable to either TOD Alternative A or Alternative B is unlikely to be significant, relative to overall population growth trends.

No Kakaʻako-specific Facility Construction Impacts are anticipated, and the net islandwide de facto population growth from either alternative is not sufficient to require any specific facility construction elsewhere on the island.

Education: As with other agencies, it is assumed that the Kakaʻako-specific Operational Impacts are *not* part of the net islandwide impacts, because the TOD Alternatives do not

cause creation of housing or population on O‘ahu that would not otherwise take place – it would simply attract more of it to Kaka‘ako.

For purposes of this analysis, the relevant project impacts that would affect public education would consist of an estimated 5,354 full-time residents directly or indirectly supported by jobs associated with new hotels and part-time residents in Kaka‘ako under TOD Alternative A (4,934 under TOD Alternative B), and conservatively assumed not to be part of the island’s population base under the Future Baseline Condition. (See calculations in subsequent Table 4-67.) These residents would be distributed throughout the island.

Given the assumed average household size of 2.95, this implies 1,816 O‘ahu households would be created or maintained under TOD Alternative A, and 1,673 households under Alternative B. The procedure for estimating student counts involves application of DOE multipliers, as was done in the Kaka‘ako-specific analysis. However, the multipliers used there were specifically for multi-family units in urban Honolulu, and DOE multipliers for other unit types and/or other locations tend to be higher. Because DOE has no generic islandwide average multipliers, we have (with tentative concurrence of DOE) boosted the multipliers used for Kaka`ako specific impacts by 15% to approximate an islandwide average, though we have retained the same estimated per-student cost. With these assumptions, the islandwide operational impacts equate to an additional 353 students and $4.18 million annual operational cost for TOD Alternative A and 325 students and $3.85 million for TOD Alternative B (see Table 4-62).

Table 4-62: Islandwide Operational Impacts on Schools KNOX 7.13 HERE

Islandwide Impact on Schools, by Alternative		Adjusted Student Generation Rates	Islandwide Students Generated	Average Per-Student Cost	Total Annual Impact
TOD Alternative B	Elementary	0.094	158		
	Middle	0.038	63		
	High	0.062	104		
	Total:		**325**	**$11,854**	**$3,852,016**
TOD Alternative A	Elementary	0.094	171		
	Middle	0.038	69		
	High	0.062	113		
	Total:		**353**	**$11,854**	**$4,181,465**

With regard to Facility Construction Impacts, the logic used by DOE and the logic used elsewhere in our analysis for other agencies differ. Other agencies did not assume that the relatively small net-islandwide population impacts would generate facility costs of any magnitude that could be calculated. However, the DOE (and the foregoing analysis for Kaka`ako specific impacts) uses average multipliers per dwelling unit in Kaka‘ako, and so

the islandwide analysis here will follow suit. However, the multipliers for this purpose are associated just with units producing the 353 new students (TOD Alternative A) and 325 new students (Alternative B) in Table 4-62.

Exact DOE multipliers for dwelling units change according to location and unit type – both of which are unknown for the islandwide population and housing unit impacts. The DOE uses the same construction cost multipliers previously used in Table 4-56 for Kakaʻako-specific calculations, but reduces the land cost multipliers by an estimated 15% to recognize lower land costs outside the urban core. The resulting analysis suggests an islandwide facility cost impact of about $34 million for TOD Alternative B and nearly $37 million for TOD Alternative A.

Parks and Recreation: Islandwide Operational Cost Impacts for parks and recreation are borne primarily by the City DPR, but potentially also by the State Parks Division of the State DLNR. According to DPR staff, additional net islandwide population would naturally mean more people would use Oʻahu parks. However, DPR was unable to determine how this increase in use would generate the need for additional personnel, increase the need for park maintenance and thus impact the overall operating cost.

To address this uncertainty, the socio-economic impact report author, John M. Knox & Associates (hereinafter, "JMK"), developed its rough assumptions for these operational cost impacts. First, JMK assumed the small magnitude of the net islandwide population increase would generate limited overall Operational Impact, primarily cost for additional personnel. JMK assumed these personnel impacts would be similar to those for the Honolulu Fire Department, an agency with roughly the same number of funded positions for Fiscal Year 2012 (**although HFD salaries are higher than those for DPR**). Note that this is a conservative assumption, because the HFD estimate of additional personnel needed for the islandwide population impact exceeded that of the much larger Honolulu Police Department.

JMK adapted the HFD's assumption of ten total additional personnel needed for the islandwide population increase under either TOD Alternative A or B. DPR's FY2012 budget [29] was then used to calculate the cost of adding these additional City workers, by dividing the amount authorized for salaries ($38,039,036) by the authorized number of positions at DPR (1,157.65). This results in a cost per worker of $32,859. The Operational Cost Impact for both TOD Alternative A and B would thus be about $328,590.

Small net islandwide operational impacts on State parks would fall to the DLNR's State Parks Division rather than HCDA, whose responsibilities are largely confined to Kakaʻako. The Director of the State Parks Division said the small estimated increase in net islandwide population is not likely to impact on State parks located on Oʻahu. He noted

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[29] City and County of Honolulu. *Departmental and Agency Reports of the City and County of Honolulu for Fiscal Year July 1, 2011 to June 30*. http://www1.honolulu.gov/csd/wholebook.pdf.

that "State Parks, unlike County Parks, aren't created based on population, rather they are natural or cultural resource based." [30]

Islandwide Facility Construction Costs would be attributable to any additional facility costs due to net islandwide population increase. However, the net islandwide population increase is sufficiently small that these costs are likely to be zero for both Alternatives.

Islandwide Public Infrastructure: The incremental islandwide population increase related to the three hotels and additional part-time residents under either TOD Alternative A or B is not seen as likely to strain islandwide public infrastructure. While cumulative impacts of small increments of population eventually do create infrastructure needs, the population levels assessed here are sufficiently small that the cost may be appropriately equated to $0.

Summary of Islandwide Costs: Table 4-63 and Table 4-64 summarize the foregoing cost information, and also provide estimates of direct construction job-years associated with islandwide facility/infrastructure impacts.

30 Email Communication with Dan Quinn, Director, DLNR, Division of State Parks. Oct. 14, 2013.

Table 4-63: Summary, Islandwide Cost Impacts of TOD Alternative B

	One-Time Construction, Equipment		Annual Operations	
	Nature of Cost	Amount	Nature of Cost	Amount
FACILITIES				
City and County of Honolulu Agencies				
Fire Department	(None)	$0	Additional Personnel	$818,200
Police Department	(None)	$0	Additional Personnel	$578,277
Emergency Services	(None)	$0	Additional Personnel	$160,610
Parks & Recreation[a]	(None)	$0	Additional Personnel	$328,588
Total Facilities Cost:		**$0**	**Total Operations Cost:**	**$1,885,675 (annually)**
Associated Direct Construction Job-Year Impact:		**0**		
State of Hawaii Agencies				
Dept. of Education	Share of New Schools	$33,974,873	Personnel, other support	$3,852,016
DLNR Parks	(None)	$0	(None)	$0
Total Facilities Cost:		**$33,974,873**	**Total Operations Cost:**	**$3,852,016 (annually)**
Associated Direct Construction Job-Year Impact:[b]		**48**		
INFRASTRUCTURE			**Note: Construction job numbers in this table add up to sum shown in the subsequent Table 4-65, column for "State Facilities" through "County Infrastructure."**	
City and County of Honolulu Agencies				
(None affected)	(None)	$0		
Total Infrastructure Cost:		**$0**		
Associated Direct Construction Job-Year Impact:		**0**		
State of Hawaii Agencies				
(None affected)	(None)	$0		
Total Infrastructure Cost:		**$0**		
Associated Direct Construction Job-Year Impact:		**0**		

[a] City Parks & Recreation figures represent JMK Associates assumptions, as detailed in text of Socio-Econ Impact Report.
[b] Though DOE cost figures here include Land Acquisition, job estimates based on Construction costs only.

Table 4-64: Summary, Islandwide Cost Impacts of TOD Alternative A

	One-Time Construction, Equipment		Annual Operations	
	Nature of Cost	Amount	Nature of Cost	Amount
FACILITIES				
City and County of Honolulu Agencies				
Fire Department	(None)	$0	Additional Personnel	$818,200
Police Department	(None)	$0	Additional Personnel	$634,212
Emergency Services	(None)	$0	Additional Personnel	$176,145
Parks & Recreation[a]	(None)	$0	Additional Personnel	$328,588
Total Facilities Cost:		**$0**	**Total Operations Cost:**	**$1,957,146 (annually)**
Associated Direct Construction Job-Year Impact:		**0**		
State of Hawaii Agencies				
Dept. of Education	Share of New Schools	$36,880,619	Personnel, other support	$4,181,465
DLNR Parks	(None)	$0	(None)	$0
Total Facilities Cost:		**$36,880619**	**Total Operations Cost:**	**$4,181,465 (annually)**
Associated Direct Construction Job-Year Impact:[b]		**52**		
INFRASTRUCTURE			**Note: Construction job numbers in this table add up to sum shown in the subsequent Table 4-66, column for "State Facilities" through "County Infrastructure."**	
City and County of Honolulu Agencies				
(None affected)	(None)	$0		
Total Infrastructure Cost:		**$0**		
Associated Direct Construction Job-Year Impact:		**0**		
State of Hawaii Agencies				
(None affected)	(None)	$0		
Total Infrastructure Cost:		**$0**		
Associated Direct Construction Job-Year Impact:		**0**		

[a] City Parks & Recreation figures represent JMK Associates assumptions, as detailed in text.
[b] Though DOE cost figures here include Land Acquisition, job estimates based on Construction costs only.

4.10.11 Islandwide Economic Impacts

This Section provides estimates of islandwide impacts. As discussed in Section 1.6 (Methods and Assumptions) of Appendix G, islandwide impacts are actually substantially *smaller* than Kakaʻako-specific impacts, because they are based only on project elements that are assumed not to occur somewhere on the island – whether in Kakaʻako or elsewhere – if transit-oriented development is not implemented in Kakaʻako:

- Construction and operation of three hotels (illustrative hotel types including a full-service hotel for travelers desiring to stay outside Waikīkī, a business-oriented hotel; and a condo-hotel);

- Initial expenditures by an increased number of part-time residents to furnish and accessorize units, as well as large purchases by some for automobiles (these initial one-time expenditures counted along with construction impacts) and ongoing average annual expenditures by part-time residents (counted with operational impacts);

- Construction of additional government public facilities and/or infrastructure required by population growth and development associated with the above factors.

4.10.11.1 Construction: Islandwide Economic & Population Impacts

Islandwide construction impacts flow from development of three hotels and the various public facilities and infrastructure increments discussed in Section 4.10.10, along with initial expenditures by part-time residents to prepare their new homes for occupancy.

Table 4-65 and Table 4-66 show the calculation process and results. Each begins with the key inputs of dollars spent in the Hawaiʻi economy. Please refer to Chapter 2, Section 2.4 of Appendix G for a complete and detailed discussion of the methodology and assumptions upon which this analysis is based.

Output (Economic Activity): Due to the circulation of money through the economy (multiplier or "ripple" effects), for Alternative B, the initial direct output increment of about $235 million would result in a total $496 million in overall sales, payments, and exchanges (i.e., that much *more* under Alternative B than the Future Baseline Condition). For Alternative A, the total statewide economic impact is $474 million.

Earnings: Of this additional economic activity, for Alternative B, about $75 million would be for direct household earnings of construction workers, supporting professionals, and retailers. With the multiplier effects, the total earnings come to about $150 million. For Alternative A, comparable figures are $73 million and $144 million. Note that given the multitude of assumptions that went into this analysis, the difference between the two Alternatives is likely not significant as the outcome can change based on actual development proposals.

Table 4- 65: Islandwide Construction Impacts – TOD Alternative B

Change from Future Baseline Condition to TOD Alternative B in Construction Costs									
	Full-Service Hotel	Business Hotel	Condo-Hotel	State Facilities	County Facilities	State Infrastructure	County Infrastructure	Part-Time Res. Initial Spend	Total
Inputs									
Total Construction Cost	$81,267,542	$61,000,453	$67,304,264	$12,978,064	$0	$0	$0	$12,254,116	**$234,804,439**
Hard Costs (94%)	$76,391,489	$57,340,426	$63,266,009	$12,199,380	$0	$0	$0	N/A[1]	
Soft Costs (6%)	$4,876,053	$3,660,027	$4,038,256	$778,684	$0	$0	$0	N/A[1]	
Hard Cost Multipliers	*Sector: Construction of "Other" (Non-Residential) Buildings*					*Sector: Heavy/Civil Construction*		*Sector: Retail*	
Direct Earnings	0.297	0.297	0.297	0.297	0.297	0.297	0.297	0.363	
Direct Jobs/$1M (Mid-2022)	3.588	3.588	3.588	3.588	3.588	6.157	6.157	11.975	
Direct State Taxes	0.069	0.069	0.069	0.069	0.069	0.016	0.016	0.079	
Total (Type II) Output	2.132	2.132	2.132	2.132	2.132	2.146	2.146	1.827	
Total (Type II) Earnings	0.628	0.628	0.628	0.628	0.628	0.643	0.643	0.584	
Total (Type II) Jobs/$1M (Mid-2022)	11.000	11.000	11.000	11.000	11.000	12.000	12.000	17.300	
Total (Type II) State Taxes	0.136	0.136	0.136	0.136	0.136	0.083	0.083	0.125	
Soft Cost Multipliers									
Direct Earnings	0.595	0.595	0.595	0.595	0.595	0.595	0.595	N/A	
Direct Jobs/$1M (Mid-2022)	4.854	4.854	4.854	4.854	4.854	4.854	4.854	N/A	
Direct State Taxes	0.082	0.082	0.082	0.082	0.082	0.082	0.082	N/A	
Total (Type II) Output	2.033	2.033	2.033	2.033	2.033	2.033	2.033	N/A	
Total (Type II) Earnings	0.884	0.884	0.884	0.884	0.884	0.884	0.884	N/A	
Total (Type II) Jobs/$1M (Mid-2022)	11.000	11.000	11.000	11.000	11.000	11.000	11.000	N/A	
Total (Type II) State Taxes	0.139	0.139	0.139	0.139	0.139	0.139	0.139	N/A	
Results for Later Fiscal Analysis									
Direct State Taxes	$5,659,826	$4,248,338	$4,687,363	$903,849	$0	$0	$0	$964,177	**$16,463,554**
Total State Taxes	$11,104,906	$8,335,484	$9,196,876	$1,773,404	$0	$0	$0	$1,526,410	**$31,937,079**
Direct GET to Counties[2]	$406,338	$305,002	$336,521	$64,890	$0	$0	$0	$61,271	**$1,174,022**
Total GET to Counties[2]	$827,865	$621,406	$685,622	$132,206	$0	$0	$0	$111,916	**$2,379,015**
Economic Impacts (Statewide)									
Direct Output	$81,267,542	$61,000,453	$67,304,264	$12,978,064	$0	$0	$0	$12,254,116	**$234,804,439**
Direct Earnings	$25,592,118	$19,209,770	$21,194,915	$4,086,947	$0	$0	$0	$4,450,919	**$74,534,670**
Direct Jobs (Job-Years)	298	223	247	48	0	0	0	147	**962**
Total Output	$172,789,047	$129,697,661	$143,100,670	$27,593,640	$0	$0	$0	$22,383,161	**$495,564,181**
Total Earnings	$52,252,445	$39,221,351	$43,274,502	$8,344,482	$0	$0	$0	$7,150,933	**$150,243,713**
Total Jobs (Job-Years)	894	671	740	143	0	0	0	212	**2,660**
Population Impacts (Person-Years)									
Off-Island Construction Workers[3]	60	45	49	10	0	0	0	N/A	**163**
On-Island Total Workers	834	626	691	133	0	0	0	212	**2,497**
On-Island Total Pop. Supported[4]	1,649	1,238	1,366	263	0	0	0	419	**4,934**

[1] Hard/soft cost distinction not applicable to initial expenditures by part-time residents, though retail multipliers shown in "Hard Cost" multiplier rows for visual convenience. [2] General Excise Tax (GET) calculated as 0.5% of direct of total County output (about 96% of Statewide). [3] Assumed average of 20% of direct construction from off-island. [4] At 1.976 population-to-worker ratio.

Table 4-66: Islandwide Construction Impacts of TOD Alternative A

Change from Future Baseline Condition to TOD Alternative A in Construction Costs	Full-Service Hotel	Business Hotel	Condo-Hotel	State Facilities	County Facilities	State Infrastructure	County Infrastructure	Part-Time Res. Initial Spend	Total
Inputs									
Total Construction Cost	$81,267,542	$61,000,453	$41,324,943	$14,088,030	$0	$0	$0	$29,210,276	**$226,891,244**
Hard Costs (94%)	$76,391,489	$57,340,426	$38,845,447	$13,242,748	$0	$0	$0	N/A[1]	
Soft Costs (6%)	$4,876,053	$3,660,027	$2,479,497	$845,282	$0	$0	$0	N/A[1]	
Hard Cost Multipliers	*Sector: Construction of "Other" (Non-Residential) Buildings*					*Sector: Heavy/Civil Construction*		*Sector: Retail*	
Direct Earnings	0.297	0.297	0.297	0.297	0.297	0.297	0.297	0.363	
Direct Jobs/$1M (Mid-2022)	3.588	3.588	3.588	3.588	3.588	6.157	6.157	11.975	
Direct State Taxes	0.069	0.069	0.069	0.069	0.069	0.016	0.016	0.079	
Total (Type II) Output	2.132	2.132	2.132	2.132	2.132	2.146	2.146	1.827	
Total (Type II) Earnings	0.628	0.628	0.628	0.628	0.628	0.643	0.643	0.584	
Total (Type II) Jobs/$1M (Mid-2022)	11.000	11.000	11.000	11.000	11.000	12.000	12.000	17.300	
Total (Type II) State Taxes	0.136	0.136	0.136	0.136	0.136	0.083	0.083	0.125	
Soft Cost Multipliers									
Direct Earnings	0.595	0.595	0.595	0.595	0.595	0.595	0.595	N/A	
Direct Jobs/$1M (Mid-2022)	4.854	4.854	4.854	4.854	4.854	4.854	4.854	N/A	
Direct State Taxes	0.082	0.082	0.082	0.082	0.082	0.082	0.082	N/A	
Total (Type II) Output	2.033	2.033	2.033	2.033	2.033	2.033	2.033	N/A	
Total (Type II) Earnings	0.884	0.884	0.884	0.884	0.884	0.884	0.884	N/A	
Total (Type II) Jobs/$1M (Mid-2022)	11.000	11.000	11.000	11.000	11.000	11.000	11.000	N/A	
Total (Type II) State Taxes	0.139	0.139	0.139	0.139	0.139	0.139	0.139	N/A	
Results for Later Fiscal Analysis									
Direct State Taxes	$5,659,826	$4,248,338	$2,878,050	$981,152	$0	$0	$0	$2,298,321	**$16,065,687**
Total State Taxes	$11,104,906	$8,335,484	$5,646,899	$1,925,077	$0	$0	$0	$3,638,522	**$30,650,887**
Direct GET to Counties[2]	$406,338	$305,002	$206,625	$70,440	$0	$0	$0	$146,051	**$1,134,456**
Total GET to Counties[2]	$827,865	$621,406	$420,973	$143,513	$0	$0	$0	$266,775	**$2,280,532**
Economic Impacts (Statewide)									
Direct Output	$81,267,542	$61,000,453	$41,324,943	$14,088,030	$0	$0	$0	$29,210,276	**$226,891,244**
Direct Earnings	$25,592,118	$19,209,770	$13,013,717	$4,436,489	$0	$0	$0	$10,609,707	**$72,861,801**
Direct Jobs (Job-Years)	298	223	151	52	0	0	0	350	**1,074**
Total Output	$172,789,047	$129,697,661	$87,864,078	$29,953,623	$0	$0	$0	$53,354,998	**$473,659,407**
Total Earnings	$52,252,445	$39,221,351	$26,570,624	$9,058,155	$0	$0	$0	$17,045,760	**$144,148,336**
Total Jobs (Job-Years)	894	671	455	155	0	0	0	505	**2,680**
Population Impacts (Person-Years)									
Off-Island Construction Workers[3]	60	45	30	10	0	0	0	N/A	**145**
On-Island Total Workers	834	626	424	145	0	0	0	505	**2,535**
On-Island Total Pop. Supported[4]	1,649	1,238	838	286	0	0	0	999	**5,009**

[1] Hard/soft cost distinction not applicable to initial expenditures by part-time residents, though retail multipliers shown in "Hard Cost" multiplier rows for visual convenience. [2] General Excise Tax (GET) calculated as 0.5% of direct of total County output (about 96% of Statewide). [3] Assumed average of 20% of direct construction from off-island. [4] At 1.976 population-to-worker ratio.

Jobs (Job-years): Full build-out under Alternative B would create or maintain about 960 more job-years of direct employment than would full build-out of the Future Baseline Condition – with multiplier effects, total job-years of employment reaches about 2,660. For Alternative A, comparable figures are about 1,075 and 2,680.

Population Impacts: A relatively small proportion of direct construction workers would likely come from off-island, but the on-island direct workers plus indirect/induced workers would support a total population (themselves and dependents) of about 4,935 at build-out – again, this much *more* created or maintained under TOD Alternative B than under the Future Baseline Condition. For Alternative A, the result is almost the same at nearly 5,010.

4.10.11.2 Operations: Islandwide Economic & Population Impacts

Operational impacts discussed here are on an *annual* basis, and flow entirely from new hotel guest spending and the additional annual expenditures of the incremental part-time resident population (i.e., additional numbers present under either of the TOD Alternatives, A or B, compared to the Future Baseline Condition). Please refer to Chapter 2, Section 2.7 of Appendix G for a complete and detailed discussion of the methodology and assumptions upon which this analysis is based.

Table 4-67 shows how earlier results are combined to estimate change from the Future Baseline Condition to TOD Alternative B in the key input of total annual expenditures. It indicates values of various Visitor Expenditure (VE) and Personal Consumption Expenditure (PCE) multipliers from the State's Input-Output (I-O) Model, and indicates interim results used in the following Section analysis of fiscal impacts. Table 4-68 does the same for TOD Alternative A.

Output (Economic Activity): After build-out, the project under TOD Alternative B is estimated to generate about $180 million more in direct output annually than under the Future Baseline Condition. With multiplier effects, the difference in total output would be about $324 million, mostly attributable to spending by hotel guests.

For TOD Alternative A, the direct output impact is about $197 million, and total output impact about $351 million. TOD Alternative A thus generates impacts about 8% - 10% higher than TOD Alternative B.

Earnings: Earnings flowing to households would be about $48 million more under TOD Alternative B than under the Future Baseline Condition due to direct visitor and part-time resident expenditures; about $94 million total impact with multiplier effects annually.

Results for TOD Alternative A are again about 8% greater – direct earnings of $52 million and total with multiplier effects of about $101 million annually.

Table 4-67: Islandwide Operational Impacts of TOD Alternative B

Change from Future Baseline to TOD Alternative B					
	Visitors, Full-Service Hotel	Visitors, Business Hotel	Visitors, Condo-Hotel	Part-Time Residents	Total
Inputs					
Average Daily Population (Change)	685	469	598	354	**2,106**
Total Visitor Days on O'ahu[1]	250,329	171,142	218,333	129,421	**769,226**
Average Daily Expenditure on Oahu[2]	$281.66	$281.66	$195.44	$151.59	
Air Transportation Adjustment	$2.07	$2.07	$1.48	$1.48	
Accommodations Part of Expenditure[2]	$115.00	$115.00	$87.13	$43.30	
Adjusted Average Daily Expenditure	$280	$280	$194	$150	
Total Expenditures on Oahu[3]	$69,989,230	$47,849,553	$42,348,415	$19,426,964	**$179,614,161**
Multipliers		*VE Multipliers*		*PCE Multiplier*	
Direct Earnings	0.273	0.273	0.273	0.233	
Direct Jobs/$1M (Mid-2022)	6.916	6.916	6.916	5.849	
Direct State Taxes	0.073	0.073	0.073	0.043	
Total (Type II) Output	1.836	1.836	1.836	1.558	
Total (Type II) Earnings	0.531	0.531	0.531	0.440	
Total (Type II) Jobs/$1M (Mid-2022)	14.100	14.100	14.100	12.250	
Total (Type II) State Taxes	0.122	0.122	0.122	0.084	
Results for Later Fiscal Analysis					
Direct State Taxes	$5,079,718	$3,472,852	$3,073,588	$845,001	**$12,471,159**
Total State Taxes	$8,549,200	$5,844,833	$5,172,868	$1,624,947	**$21,191,848**
Direct GET to Counties[4]	$338,263	$231,260	$204,021	$97,135	**$870,679**
Total GET to Counties[4]	$600,143	$410,300	$362,477	$141,577	**$1,514,497**
Accommodations Total Subject to TAT[3]	$28,788,924	$19,682,130	$19,024,166	$0	**$67,495,221**
Economic Impacts					
Direct Output	$69,989,230	$47,849,553	$42,348,415	$19,426,964	**$179,614,161**
Direct Earnings	$19,120,737	$13,072,278	$11,550,683	$4,527,218	**$48,270,916**
Direct Jobs	484	331	293	114	**1,222**
Total Output	$128,522,501	$87,867,008	$77,765,169	$30,263,773	**$324,418,451**
Total Earnings	$37,172,843	$25,413,966	$22,492,189	$8,543,452	**$93,622,449**
Total Jobs	987	675	597	238	**2,497**
Population Impacts					
Visitor and Part-Time Resident Population	685	469	598	354	**2,106**
Total Full-Time Resident Pop. Supported by Source of Economic Activity[5]	1,950	1,333	1,180	470	**4,934**
DeFacto Population Impact[6]	2,528	1,728	1,713	799	**6,768**

[1] Avg. daily population times 365.25 days. [2] From preliminary calculations, Table 2.29 in JMK Assoc. Report. [3] Appropriate base expenditure ("adjusted average" for total expenditures, "accommodations part" for total subject to TAT) times avg. daily population times 365.25 days. [4] Effective rate of 0.459% on total hotel room bills, 0.5% on all other expenditures. The 0.5% is applied to total County output (calculated from County-level multipliers – about 95% of Statewide output). [5] At 1.976 population-to-worker ratio. [6] Visitor population plus 94.5% of resident population.

Table 4-68: Islandwide Operational Impacts of TOD Alternative A

Change from Future Baseline to TOD Alternative A					
	Visitors, Full-Service Hotel	Visitors, Business Hotel	Visitors, Condo-Hotel	Part-Time Residents	Total
Inputs					
Average Daily Population (Change)	835	469	367	693	**2,364**
Total Visitor Days on O'ahu[1]	305,113	171,142	134,057	252,974	**863,287**
Average Daily Expenditure on Oahu[2]	$281.66	$281.66	$195.44	$151.59	
Air Transportation Adjustment	$2.07	$2.07	$1.48	$1.48	
Accommodations Part of Expenditure[2]	$115.00	$115.00	$87.13	$43.30	
Adjusted Average Daily Expenditure	$280	$280	$194	$150	
Total Expenditures on Oahu[3]	$85,306,312	$47,849,553	$26,002,006	$37,973,036	**$197,130,907**
Multipliers		*VE Multipliers*		*PCE Multiplier*	
Direct Earnings	0.273	0.273	0.273	0.233	
Direct Jobs/$1M (Mid-2022)	6.916	6.916	6.916	5.849	
Direct State Taxes	0.073	0.073	0.073	0.043	
Total (Type II) Output	1.836	1.836	1.836	1.558	
Total (Type II) Earnings	0.531	0.531	0.531	0.440	
Total (Type II) Jobs/$1M (Mid-2022)	14.100	14.100	14.100	12.250	
Total (Type II) State Taxes	0.122	0.122	0.122	0.084	
Results for Later Fiscal Analysis					
Direct State Taxes	$6,191,410	$3,472,852	$1,887,188	$1,651,687	**$13,203,138**
Total State Taxes	$10,420,185	$5,844,833	$3,176,151	$3,176,213	**$22,617,382**
Direct GET to Counties[4]	$412,291	$231,260	$125,269	$189,865	**$958,686**
Total GET to Counties[4]	$731,483	$410,300	$222,562	$276,735	**$1,641,080**
Accommodations Total Subject to TAT[3]	$35,089,355	$19,682,130	$11,680,874	$0	**$66,452,359**
Economic Impacts					
Direct Output	$85,306,312	$47,849,553	$26,002,006	$37,973,036	**$197,130,907**
Direct Earnings	$23,305,293	$13,072,278	$7,092,141	$8,849,156	**$52,318,868**
Direct Jobs	590	331	180	222	**1,323**
Total Output	$156,649,540	$87,867,008	$47,747,958	$59,155,274	**$351,419,780**
Total Earnings	$45,308,087	$25,413,966	$13,810,246	$16,699,512	**$101,231,811**
Total Jobs	1,203	675	367	465	**2,709**
Population Impacts					
Visitor and Part-Time Resident Population	835	469	367	693	**2,364**
Total Full-Time Resident Pop. Supported by Source of Economic Activity[5]	2,377	1,333	724	919	**5,354**
DeFacto Population Impact[6]	3,082	1,728	1,052	1,561	**7,423**

[1] Avg. daily population times 365.25 days. [2] From preliminary calculations, Table 2.29 in JMK Assoc. Report. [3] Appropriate base expenditure ("adjusted average" for total expenditures, "accommodations part" for total subject to TAT) times avg. daily population times 365.25 days. [4] Effective rate of 0.459% on total hotel room bills, 0.5% on all other expenditures. The 0.5% is applied to total County output (calculated from County-level multipliers – about 95% of Statewide output). [5] At 1.976 population-to-worker ratio. [6] Visitor population plus 94.5% of resident population.

Jobs (Full- and Part-Time): Direct jobs created or maintained by new hotel guest and additional part-time resident spending would be about 1,200 more under TOD Alternative B. (Note that these direct jobs are *islandwide*, because visitor expenditures are not limited to Kakaʻako.) With multiplier effects, the total job impact is estimated as about 2,500 – again, mostly attributable to hotel guest expenditures.

For TOD Alternative A, comparable figures are a bit over 1,300 direct and 2,700 total, impact figures about 8% - 9% greater than for TOD Alternative B.

Population Impacts: Total additional employment would support a full-time resident population of about 4,930 people (workers plus dependents) more under TOD Alternative B than under the Future Baseline Condition. Subtracting average off-island resident population and adding the visitor population, the total de facto population impact would be nearly 6,760.

Results for TOD Alternative A are 9% - 10% higher – about 5,350 resident population and about 7,425 total de facto population.

All of these impact figures – output, earnings, jobs, and population – represent amounts "created *or* maintained," depending on what else is happening in the economy.

4.10.12 Fiscal Impacts

This Section provides general estimates of fiscal cost-revenue impacts for two levels of local government – the State of Hawai`i and the City and County of Honolulu. The central question for such analyses is simply whether build-out under either TOD Alternative is likely to generate more revenues than costs for each level of government, compared to the cost-revenue balance for build-out under existing HCDA Rules. The answers to this question are subject to ***important caveats discussed in the following sub-section.***

However, the Section first begins with a qualitative discussion about evidence for overall governmental cost savings for concentrated development patterns such as TOD versus dispersed development patterns, and then sets forth quantitative estimates of the impacts of the proposed Alternatives. The quantitative analyses are properly done at the *islandwide* level, and so flow primarily from the results of the previous two Sections rather than the much earlier ones on Kakaʻako-specific impacts.

4.10.12.1 General Principals of Concentrated vs. Dispersed Development

Among other things, the TOD Alternatives will result in a *population shift* of some 12,800 full-time residents (for Alternative A, or 9,100 for Alternative B) into the Kakaʻako area who would otherwise be living "somewhere else" on Oʻahu as of 2035. Though it may reasonably be assumed that many of these people would choose to live in other high-density areas, likely even in other TOD developments around future stations, there is no

way to know exactly where they would choose to live under the Future Baseline Condition. They would almost certainly not be in a single identifiable alternative location, but would be dispersed to various locations throughout the island. Therefore, it is impossible to quantify government costs – especially facility development costs – associated with accommodating this relatively small population[31] under the Future Baseline Condition.

However, both TOD Alternatives are consistent with State and City policies to concentrate much of the island's future growth in Kakaʻako or similar higher-density locations, particularly -related TOD. Those policies reflect general principles of reduced governmental costs and other economic benefits.

For governments, economic benefits associated with TOD-style concentrated development patterns include:

- Savings on city infrastructure and public facilities operations and maintenance costs;
- Increases in municipal revenues;
- Increased property values;
- Lower transportation costs;
- Promotion of local economic development; and
- Savings on health care.

Recent studies[32] have shown that "growth focused in existing urban areas takes advantage of existing infrastructure and capitalizes on the efficiencies of providing service to higher concentrations of jobs and housing."[33] The studies indicate that more dispersed development require more lengthy roads, greater sewer and water systems infrastructure, and generally incur larger operations and maintenance costs than compact development. TOD is able to maximize infrastructure capacity, and keep overall costs down.

Public facilities and services are also more efficient in TOD, where development is more compact by promoting quicker response times for such services as police and fire on a smaller footprint. School grounds in TOD are also more compact,[34] thus decreasing overall operating and maintenance costs. Denser locations (such as TOD), and close proximity to major transit systems are also reported as supporting higher property

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31 The Hawaiʻi State DBEDT Long-Range Forecasts a 2035 Oʻahu population of 1,071,221. The population shift would thus involve roughly 1% of the island's total number of full-time residents.

32 Examples include (a) The Pacific Resource Partnership (PRP) and Calthorpe Associates (2013). *Honolulu Transit Oriented Development Study Scenarios.* http://www.calthorpe.com/files/Honolulu%20TOD%20Scenarios%20Report.pdf;(b) Center for Transit Oriented Development (2011). *Rails to Real Estate Development Patterns along Three New Transit Lines.* http://ctod.org/pdfs/2011R2R.pdf; and c) Goetz, E.G. et al. (2010). *The Hiawatha Line: Impacts on Land Use and Residential Housing Value*. University of Minnesota Center for Transportation Studies. CTS Report 10-09.

33 PRP and Calthorpe Associates, *op. cit.*, p. 16

34 Some urban schools now share athletic fields at sites remote from each location.

values. Because of this, compact development typically generates higher local revenues than more dispersed development.

Compact development can help generate revenue for the private sector as well. It is reported that, "Projects near transit are viewed as having the potential to achieve faster absorption rates, higher occupancy rates, and in some cases higher sales prices or rents".[35] Because TOD supports greater proximity to transit, work, shopping and recreational uses, TOD residents also enjoy lower transportation costs, which results in greater overall affordability for households. Additionally, TOD projects have the potential to generate enhanced economic activity related to new construction, neighborhood urban revitalization; thus promoting local economic development. Finally, TOD can help reduce the cost of medical care and impact on local medical facilities, by promoting healthier lifestyles, encouraging walking and biking, and allowing residents enjoy the health benefits associated with reduced energy consumption, which reduce greenhouse gas emissions and air pollution.

4.10.12.2 Methods and Caveats for Quantitative Analysis

It is important to reiterate that results of this analysis focus on the net new *islandwide* components largely common to each TOD Alternative – i.e., three new hotels and an increment in the part-time resident population – plus construction of public facilities and infrastructure (whether in Kakaʻako or elsewhere on island) assumed to occur only due to the TOD Alternatives. There will be many public expenditures required, and revenues raised, in Kakaʻako as a result of the TOD Alternatives that will also be generated no matter where on Oʻahu that new residential and commercial demand is accommodated.

Because the methods underlying this analysis yield results that appear very precise, it is also useful to remind the reader that all the input to this analysis stem from assumed "scenarios" of possible ways that Kakaʻako might build out under existing Rules (Future Baseline Condition) and or proposed TOD Alternatives (A or B). Like every other analysis in this study, the following fiscal cost-revenue calculations are actually *illustrative and indicative* of potential outcomes – not calculations of specific known proposals that developers/landowners have stated firm intentions to carry out.

Furthermore, the ***islandwide inputs to the analysis are very similar, meaning the results will be very similar.*** This Section will present separate results for each Alternative, but will also point out their practical equivalence.

Beyond this general sense of testing the changes in two *very* hypothetical long-term realities, this cost-revenue analysis is constrained by key uncertainties related both to assumed costs and assumed revenues.

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[35] Center for Transit Oriented Development (2011), *op. cit.*, p. 2.

Government Cost Uncertainties: The analysis of "Public Services and Facilities," pointed out several concerns about costing future facility construction and operations for Kakaʻako and urban Honolulu in general –

- While no new publicly funded Kakaʻako park or recreational facilities are proposed in this EIS, the additional population expected under *either* scenario will greatly impact existing/nearby facilities. HCDA is planning a study of likely recreational needs and solutions that *might* result in more taxpayer-funded facilities. Whether such taxpayer-supported facilities will actually be developed, and whether or to what extent costs would be higher due to either of the TOD Alternatives, remains an Unresolved Issue at the time of the preparation of this EIS. It is probably the most critical of the issues noted in this short series of bullet points.

- Similarly, Hawaiʻi in general faces challenges to provision of enough public health facilities – private or public – as the population grows. While either one of the TOD Alternatives is highly unlikely to determine the nature of the final response to these challenges, it should be remembered that some additional public expenditures are likely to be needed under any of the scenarios, including the Future Baseline.

Furthermore, as discussed in Chapter Two, Section 2.8 of Appendix G, government costs and revenues – for both services and for capital expenditures – generally balance out for residential population increases, and so this analysis estimates service costs only for transient populations and includes no averaged capital costs. However, as a strongly conservative step, islandwide service and facility costs (particularly DOE facility costs) are included if they were attributed by the agencies to Kaka`ako. It is not clear that this is appropriate, since it could be viewed as double-counting, but these costs *will* be included, albeit subject to comment about their overall effect on results.

Government Revenue Uncertainties: All revenues cited in this analysis come from standard tax sources typically associated with the sorts of costs that have been listed. However, the HCDA is an atypical agency – it is a *development authority* with the powers to impose public facilities dedication as a condition for developing real property within the community development district. That means it is possible that some currently unknown amount of revenues will come not from overall taxpayers, but initially from developers and ultimately from residential or commercial purchasers/lessees.

Beyond the foregoing caveats and uncertainties … the full methodology, including explanation of assumed multipliers, is to be found in Chapter 2, Section 2.8 of Appendix G. As noted there, analysis for each level of government must be divided into:

1. The Construction phase, which for this analysis involves the *cumulative* effects of all construction over time; and
2. The Operational phase, which is properly assessed at a representative point-in-time *annual* basis.

In a standard fiscal cost-revenue analysis, results of both phases would be presented together in a single table for each TOD Alternative by year, with cumulative figures indicating points in time when any negative balance for Construction might be eventually offset by potential positive balances for Operations. That is not possible for this sort of hypothetical analysis with unclear timeframes, but the textual interpretation of the tables will note when and if such offsetting results are found.

As with other islandwide analyses, this analysis reflects inputs that are already "impacts" (i.e., differences between each of the TOD Alternatives and the Future Baseline Condition), and then calculates results from those. This generates results identical to those that would flow from the more cumbersome procedure of separately calculating Future Baseline Condition and TOD Alternative results, and then subtracting.

4.10.12.3 Construction Phase

State: The upper parts of Table 4-69 and Table 4-70 indicate that construction elements, in and of themselves, would result in about a $2.3 million net revenue *loss* for the State for TOD Alternative B and a larger $6.5 loss for Alternative A. The private-sector portions of the equation (hotels and part-time residential population) generate overwhelmingly positive returns. However, these are substantially, though not entirely, offset by the very conservative inclusion of DOE public school costs for land acquisition and construction.

In an analysis of this nature, these apparent net losses are actually relatively small and fairly similar. Perhaps more importantly, **they would be offset by considerably larger annual Operational phase positive balances** (see following Operational Phase Sub-Section) at build-out. As will be seen, just one year's net Operational positive balance for State government would wipe away the calculated loss from the Construction phase under either TOD Alternative A or B.

City and County of Honolulu: The lower parts of Table 4-69 and Table 4-70 show modest positive balances of a little over $2 million each for the City and County of Honolulu related to TOD Alternatives B and A, respectively. This is in part because of the assumption that County revenues are limited to a modest share of the General Excise Tax (GET) derived from construction activity.

It also reflects the very small County costs *or* revenues that can be directly associated with this very marginal addition to a much larger directed growth strategy. In the "bigger picture," as per studies discussed at the outset of this Section, concentrated development on average is more cost-effective for municipal governments than is dispersed development.

Table 4-69: State and County Fiscal Cost-Revenue Impacts – Construction Phase – TOD Alternative B

Costs/Revenues Flowing from Change from Future Baseline to TOD Alternative B in Construction Costs (Cumulative)									
	Full-Service Hotel	Business Hotel	Condo-Hotel	State Facilities	County Facilities	State Infra-structure	County Infra-structure	Part-Time Resident Initial Expenditures	TOTAL
State Costs									
Total State Facility, Infrastructure Costs[1]				$33,974,873		$0			$33,974,873
Service Cost, Off-Island Constr. Workers[2]	$90,422	$67,872	$74,885	$14,440	$0	$0	$0		$247,619
Total State Costs	***$90,422***	***$67,872***	***$74,885***	***$33,989,313***	***$0***	***$0***	***$0***		***$34,222,491***
State Revenues									
Total State Tax Revenues[3]	***$11,104,906***	***$8,335,484***	***$9,196,876***	***$1,773,404***	***$0***	***$0***	***$0***	***$1,526,410***	***$31,937,079***
State Revenues Minus Costs	**$11,014,484**	**$8,267,612**	**$9,121,990**	**-$32,215,909**	**$0**	**$0**	**$0**	**$1,526,410**	**-$2,285,412**
County Costs									
Total County Facility, Infrastructure Costs[1]					$0		$0		$0
Service Cost, Off-Island Constr. Workers[2]	$56,285	$42,248	$46,614	$8,989	$0	$0	$0		$154,137
Total County Costs	***$56,285***	***$42,248***	***$46,614***	***$8,989***	***$0***	***$0***	***$0***		***$154,137***
County Revenues									
Total County Revenues (GET only)[3]	***$827,865***	***$621,406***	***$685,622***	***$132,206***	***$0***	***$0***	***$0***	***$111,916***	***$2,379,015***
County Revenues Minus Costs	**$771,579**	**$579,157**	**$639,008**	**$123,218**	**$0**	**$0**	**$0**	**$111,916**	**$2,224,878**

[1] As per input from government agencies. [2] Off-island construction workers from Table 8.1 times estimated service costs (State $1,406.02; County $968.50).
[3] Previously calculated in Table 4-67.

Table 4-70: State and County Fiscal Cost-Revenue Impacts – Construction Phase – TOD Alternative A

Costs/Revenues Flowing from Change from Future Baseline to TOD Alternative A in Construction Costs (Cumulative)									
	Full-Service Hotel	Business Hotel	Condo-Hotel	State Facilities	County Facilities	State Infra-structure	County Infra-structure	Part-Time Resident Initial Expenditures	TOTAL
State Costs									
Total State Facility, Infrastructure Costs[1]				$36,880,619		$0			$36,880,619
Service Cost, Off-Island Constr. Workers[2]	$90,422	$67,872	$45,980	$15,675	$0	$0	$0		$219,948
Total State Costs	***$90,422***	***$67,872***	***$45,980***	***$36,896,293***	***$0***	***$0***	***$0***		***$37,100,566***
State Revenues									
Total State Tax Revenues[3]	***$11,104,906***	***$8,335,484***	***$5,646,899***	***$1,925,077***	***$0***	***$0***	***$0***	***$3,638,522***	***$30,650,887***
State Revenues Minus Costs	**$11,014,484**	**$8,267,612**	**$5,600,919**	**-$34,971,217**	**$0**	**$0**	**$0**	**$3,638,522**	**-$6,449,680**
County Costs									
Total County Facility, Infrastructure Costs[1]					$0		$0		$0
Service Cost, Off-Island Constr. Workers[2]	$56,285	$42,248	$28,621	$9,757	$0	$0	$0		$136,912
Total County Costs	***$56,285***	***$42,248***	***$28,621***	***$9,757***	***$0***	***$0***	***$0***		***$136,912***
County Revenues									
Total County Revenues (GET only)[3]	***$827,865***	***$621,406***	***$420,973***	***$143,513***	***$0***	***$0***	***$0***	***$266,775***	***$2,280,532***
County Revenues Minus Costs	**$771,579**	**$579,157**	**$392,352**	**$133,756**	**$0**	**$0**	**$0**	**$266,775**	**$2,143,620**

[1] As per input from government agencies. [2] Off-island construction workers from Table 8.2 times estimated service costs (State $1,406.02; County $968.50).
[3] Previously calculated in Table 4-68.

4.10.12.4 Operational Phase

State: The upper parts of Tables 4-71 and 4-72 indicate the State would receive considerably more revenues than costs (about $14.1 million each year for TOD Alternative B and a roughly equal $14.8 million for Alternative A) due to operations of the net new islandwide components. This is because service costs associated with new transient hotel and part-time resident populations – as well as service costs for residents conservatively assumed to be on-island only because of these economic activities – are greatly outweighed by State tax revenues.

City and County of Honolulu: The lower parts of Tables 4-71 and 4-72 have two "bottom lines." As explained in Chapter 2, Section 2.8.2 of Appendix G, county government portions of the Transient Accommodations Tax (TAT, the "hotel room tax") have recently been capped by the State Legislature, such that additions to the lodging inventory under present law would not add to county coffers on any island. But for the long range, it seems reasonable to project the results if the cap is removed and additional TAT money again flows to counties under the previous formula.

If municipal revenues are limited to the GET and increased property tax values for the three hotel sites, the differences between the City and County's revenues and costs – a positive $0.08 million and negative $0.41 million for Alternative B – are essentially zero, considering all the uncertainties in this analysis.

If the TAT is restored, the analysis suggests the TOD Alternative A would generate a small positive annual balance for the County of about $1.2 million per year, and an essentially similar $0.7 million for Alternative B. Even these greater positive figures are quite small in light of the uncertainties underlying this analysis, although they are achieved in the face of various conservative assumptions. The real conclusion to be drawn from the County portions of Table 4-71 and Table 4-72 is that the project is unlikely to have any real perceptible impact at all on annual County operating budgets.

Table 4-71: State and County Fiscal Cost-Revenue Impacts – Operational Phase – TOD Alternative B

Costs/Revenues Flowing from Change from Future Baseline to TOD Alternative B -- Stabilized Operations (Annual)							
	Full-Service Hotel	Business Hotel	Condo-Hotel	Change in State Operational Spending[1]	Change in County Operational Spending[1]	Change in Part-Time Residents	TOTAL
State Costs							
Service Costs, Transient Populations[1]	$1,040,684	$711,485	$907,668			$538,039	$3,197,875
Change in Selected Islandwide Operating Costs[1]				$3,852,016			$3,852,016
Total State Costs	***$1,040,684***	***$711,485***	***$907,668***	***$3,852,016***		***$538,039***	***$7,049,892***
State Revenues							
Total State Tax Revenues[2]	***$8,549,200***	***$5,844,833***	***$5,172,868***			***$1,624,947***	***$21,191,848***
State Revenues Minus Costs	**$7,508,516**	**$5,133,349**	**$4,265,201**	**-$3,852,016**		**$1,086,908**	**$14,141,957**
County Costs							
Service Costs, Transient Populations[1]	$647,802	$442,883	$565,002			$334,917	$1,990,603
Change in Islandwide Operating Costs[1]					$1,885,675		$1,885,675
Total County Costs	***$647,802***	***$442,883***	***$565,002***		***$1,885,675***	***$334,917***	***$3,876,278***
A. County Revenues -- No Additional TAT							
GET, Annually[2]	$600,143	$410,300	$362,477			$141,577	$1,514,497
Property Tax (Change, Building Values)[3]	$947,254	$711,021	$784,499				$2,442,774
Total County Revenues, No TAT	***$1,547,397***	***$1,121,321***	***$1,146,976***			***$141,577***	***$3,957,271***
A. County Revenues (No TAT) Minus Costs	**$899,595**	**$678,438**	**$581,974**		**-$1,885,675**	**-$193,339**	**$80,993**
B. If Cap on TAT Lifted (Former TAT Laws)							
TAT to County Under Previous System	$461,661	$315,624	$305,073				$1,082,359
Total County Revenues, If TAT Restored	***$2,009,058***	***$1,436,945***	***$1,452,049***		***$0***	***$141,577***	***$5,039,630***
B. County Revenues (with TAT) Minus Costs	**$1,361,257**	**$994,062**	**$887,047**		**-$1,885,675**	**-$193,339**	**$1,163,351**

Table 4-72: State and County Fiscal Cost-Revenue Impacts – Operational Phase – TOD Alternative A

Costs/Revenues Flowing from Change from Future Baseline to TOD Alternative A -- Stabilized Operations (Annual)							
	Full-Service Hotel	Business Hotel	Condo-Hotel	Change in State Operational Spending[1]	Change in County Operational Spending[1]	Change in Part-Time Residents	TOTAL
State Costs							
Service Costs, Transient Populations[1]	$1,268,437	$711,485	$557,310			$1,051,681	$3,588,912
Change in Selected Islandwide Operating Costs[1]				$4,181,465			$4,181,465
Total State Costs	***$1,268,437***	***$711,485***	***$557,310***	***$4,181,465***		***$1,051,681***	***$7,770,377***
State Revenues							
Total State Tax Revenues[2]	***$10,420,185***	***$5,844,833***	***$3,176,151***			***$3,176,213***	***$22,617,382***
State Revenues Minus Costs	**$9,151,748**	**$5,133,349**	**$2,618,841**	**-$4,181,465**		**$2,124,532**	**$14,847,005**
County Costs							
Service Costs, Transient Populations[1]	$789,572	$442,883	$346,912			$654,647	$2,234,014
Change in Islandwide Operating Costs[1]					$1,957,146		$1,957,146
Total County Costs	***$789,572***	***$442,883***	***$346,912***		***$1,957,146***	***$654,647***	***$4,191,161***
A. County Revenues -- No Additional TAT							
GET, Annually[2]	$731,483	$410,300	$222,562			$276,735	$1,641,080
Property Tax (Change, Building Values)[3]	$947,254	$711,021	$481,684				$2,139,959
Total County Revenues, No TAT	***$1,678,738***	***$1,121,321***	***$704,245***			***$276,735***	***$3,781,039***
A. County Revenues (No TAT) Minus Costs	**$889,165**	**$678,438**	**$357,333**		**-$1,957,146**	**-$377,912**	**-$410,122**
B. If Cap on TAT Lifted (Former TAT Laws)							
TAT to County Under Previous System	$562,696	$315,624	$187,315				$1,065,635
Total County Revenues, If TAT Restored	***$2,241,433***	***$1,436,945***	***$891,561***		***$0***	***$276,735***	***$4,846,674***
B. County Revenues (with TAT) Minus Costs	**$1,451,861**	**$994,062**	**$544,648**		**-$1,957,146**	**-$377,912**	**$655,513**

[1] As noted in Section 2.6 of Appendix G, services costs are appropriately limited mostly to transient populations (hotel guests and incremental part-time resident populations), but any increases in operational spending for selected agencies are conservatively included as well. Transient population service costs again estimated as $1,406.02 for State and $968.50 for County.

[2] Previously calculated in Table 8.4. [3] Construction value times rate of $12.40 per $1,000.

4.10.13 Summary of Social Impacts

Honolulu and urban O`ahu are regarded as places of great natural beauty with a unique quality of life. However, O`ahu faces a number of challenges including high housing costs, high energy prices, high levels of traffic congestion and automotive vehicle dependence, increasing obesity rates, urban design that restricts or limits walking and healthy activities, and a high level of dependence on imported oil for energy and mobility. The Proposed Action can help to address each of these challenges, particularly in urban areas where good bus service and pedestrian infrastructure is already in place, amenities and services are abundant, and major job centers are in close proximity. The implementation of the Proposed Action in the KCCD represents the region's best opportunity to create a thriving urban neighborhood that reduces per capita demands on energy, land, and other valuable resources; creates affordable housing opportunities; and reduces the overall cost and impact of living, while simultaneously building a culturally rich and vital urban neighborhood in the heart of urban Honolulu.

In addition, there is a direct correlation between infill redevelopment supporting housing and employment within central urbanized Honolulu, and reducing development pressure in outlying regions. The Proposed Action embraces TOD strategies as a positive tool for land use planning. The State Office of Planning's report, *Leveraging State Agency Involvement in Transit Oriented Development to Strengthen Hawaii's Economy* (DBED&T, December 12, 2012), defines TOD as follows:

> "TOD is an implementation tool for achieving "smart growth," defined as compact, mixed-use, transit-linked, and walkable communities. Its primary goal is to reduce consumption of undeveloped land by concentrating development, rather than allowing low-density suburban sprawl to consume a larger land area."

In Kaka`ako, the Proposed Action will allow for a development density increase, shifting from a baseline average of 5.0 FAR (accounting for parking structures within a development, or 3.5 FAR with no parking structures) to between 8.5 and 10 FAR, and with up to 12 FAR in exceptional circumstances (a total of 3 *Iconic* towers). Finally, the Proposed Action proposes no new development in the Makai District related to the proposed transit stations, allowing this area's growth and primary uses to remain in the public domain.

The following outlines some of the fundamental benefits resulting from the implementation of the Proposed Action.

4.10.13.1 Improved Public Health

Studies show significant linkages between transportation and public health. Transit rich environments, such as Kaka`ako, will benefit not only from important statistical

reductions in traffic injuries or fatalities[36], but also reduced air pollution and increased levels of daily physical exercise[37]. This has broad implications for public health, and reduced medical costs. Studies show that obesity rates tend to fall sharply with increased walking, cycling and transit use. [38]

To encourage these positive effects, the Proposed Action applies the research. The Mobility and Access and Urban Design chapters of the TOD Plan (Appendix A) propose characteristics of the circulation network – such as the frequency of street connections, type of street design and street level uses – that are shown to influence a person's choice to drive, walk, bike, or take transit. [39] For example, an easy to navigate street grid with many intersections typically yields lower levels of auto travel, and a higher likelihood of travel by more sustainable modes.[40] [41]

The in-depth analysis of future transportation mode share and intersection function (even with substantial population growth) presented in the Kaka`ako TOD Plan (Appendix A) provides a transformational break with business-as-usual traffic planning and engineering. It introduces a vision for safe, and broadly accessible cycle routes, new pedestrian connections, and safer streets, and emphasizes walking.

4.10.13.2 Alternative Travel Options: Right to Mobility

Not all of us drive. In fact about one third of the US population is typically without access to a vehicle due to age or circumstance. However, in compact, mixed transit oriented neighborhoods such as what is envisioned under the Proposed Action for Kaka`ako, as a community we are better able to address this phenomenon by allowing individuals and families to reduce their reliance on autos, and in so doing, provide better mobility for non-driving populations.[42] [43] People who live or work in accessible, multimodal communities, with a mixture of services and within convenient walking distance of

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[36] Ewing R, Schieber R and Zegeer CV (2003b). "Urban Sprawl As a Risk Factor in Motor Vehicle Occupant and Pedestrian Fatalities." American Journal of Public Health, Vol. 9 3, No. 9, pp. 1541-1545.

[37] TRB/IOM Committee on Physical Activity, Health, Transportation, and Land Use (2005)."Does the Built Environment Influence Physical Activity? Examining the Evidence". TRB Special Report 282, Transportation Research Board/Institute of Medicine.

[38] Bassett, David, Pucher, John, et al. (2008). "Walking, cycling and obesity rates in Europe, North America and Australia." Journal of Physical Activity and Health. 5, 795-814

[39] Frank, L. et. al (2005). "Travel Behavior, Environmental and Health Impacts of Community Design and Transportation Investment (LUTAQH) A Study of Land Use, Transportation, Air Quality And Health in King County, WA" Atlanta GA, L. Frank and Company, Inc.

[40] Marshall, W. and Garrick, N. (2010). "Effects of Street Network Design on Walking and Biking." Transportation Research Record: Journal of the Transportation Research Board, Vol. 2198, pp.103-115.

[41] American Public Health Association (2003). "The Hidden Costs of Transportation Backgrounder" Urban Design 4 Health, 2010

[42] Frank, L. and Pivo, G.1994. "Impacts of Mixed Use and Density on Utilization of Three Modes of Travel, Single Occupant Vehicle, Transit and Walking." Transportation Research Record. Vol. 1466, pp 37-43

[43] Handy, S. 1993. "Regional Versus Local Accessibility; Neo-Traditional Development and its Implications for Non-Work Travel." Built Environment, Vol. 18, No.4, pp. 253-267.

transit, tend to drive 20-40% less, and use alternative modes such as transit, walking and biking more than residents of conventional, automobile-oriented communities.[44]

The Proposed Action not only provides better future access to the rapid transit project to improve regional mobility to non-drivers via the two major stations within the District, but it also further builds upon the current Ward Neighborhood and Kamehameha Schools Master Plans. Both of these Plans are dedicated to introducing more street level activity and have been engaged by HCDA to allocate space for new local circulation options for both vehicles and pedestrians.

The Proposed Action integrates this vision into the District as a whole, highlighting approximately 11 new potential street segments. It also outlines a series of street design improvements – from Primary Pedestrian streets – to connect key destinations to low speed streets and greenways. The Proposed Action directly seeks to:

- use safety as the primary design standard in street design, and prioritizes improvements to street connectivity within ½ mile of planned stations;
- provide more pedestrian street crossings at closer distances, even across the high speed and fast moving Ala Moana Boulevard;
- allow for slower Traffic Speeds and auto-free zones;
- achieve gracious sidewalks throughout the district;
- introduce innovative transportation projects – such as bike share stations and a Halekauwila Cycle track to support the mode shift from autos to bicycles;
- provide fixes for priority, high collision intersections;
- enables HCDA to plan and implement fun, temporary uses and programmed streets, such as streets activated with markets or the Eat the Street festival;
- highlight the potential for a downtown/Kaka`ako/Ala Moana Circulator (trolley);
- guide the placement of future local service for TheBus as well as integrate policy for bus stop design; and
- improve transportation efficiency and network capacity by moving more people in the same amount of space. The Proposed Action, for example, seeks to balance modes and use underutilized streets like Queen Street, Cooke and Ward Avenue.

4.10.13.3 Social Equity

The Proposed Action benefits social equity in three ways

1. Improved access to housing

The primary goal of the Proposed Action is to encourage more housing in an accessible location proximate to existing job centers. The historical trend of high demand for residential housing on O`ahu coupled with strong economic conditions could conceivably result in housing development meeting expectations in the 2035 timeframe, especially if

[44] Litman, T. 2011. "Land Use Impacts on Travel Behavior, How Land Use Factors Affect Travel Behavior," Victoria Transportation Policy Institute.

infrastructure investments identified in the Proposed Action are prioritized to support these intensive levels of development.

Within the District, proposals for more intensive land uses with taller buildings will provide a greater number of total units than what is allowable under the Future Baseline Condition. Under the current HCDA Reserved Housing Policy, 20% of all new units will be built as reserved housing. In order for landowners and/or developers to achieve density incentives, reserved housing may even take on greater percentages in some areas.

The Proposed Action also continues the strategy developed in the Mauka Area Plan (2011) to preserve characteristics of neighborhoods with existing resident populations or historic and institutional uses, particularly in the Sheridan and Civic Center neighborhoods (neither of these neighborhoods are eligible for participation in the TOD Overlay Plan's supplementary height and density programs).

While the potential redevelopment of some existing residential and commercial properties is possible, resulting in the displacement of some occupants and/or businesses, the addition of new housing opportunities and new commercial activities in the KCDD, both under the Proposed Action and the Future Baseline Condition, will provide new housing and commercial opportunities which could enable displaced residents and/or businesses to relocate elsewhere in the District, thereby mitigating to some degree the impact of displacement.

2. Provision of additional community amenity

Taller, more intensive building uses are not allowed "as of right" but become incentive based, tied to the provision of infrastructure improvements or community amenities. This is in addition to policies within the Mauka Area Rules that emphasize the livability of new buildings, with limitations on bulk and attention to design quality, as well as provisions to encourage green roofs and landscaping treatments.

As part of the implementation process, HCDA commits to developing a system that will tether the allocation of more built capacity to pay for needed community amenities. This enables HCDA to have a conversation with the community about what is needed in the District, and represents a tool to make Kaka`ako a livable, urban place. Amenities identified in the Proposed Action include pedestrian facilities, pocket parks and open space, and particularly desired uses – such as art and educational facilities.

3. Right to mobility

There is also a clear household and community wide cost-savings attributed to transit use. Families that are able to own less vehicles per household can spend those dollars elsewhere. Furthermore, walking and cycling are the most sustainable transport modes, and are affordable by virtually everyone.

4.10.13.4 An Intelligent Approach to Parking

As areas urbanize, with more people and uses competing for access to the same destinations, parking becomes highly contested. The availability and supply of parking is one of the strongest indicators of a population's likely transit mode share, with free and readily available parking strongly correlated with reduced transit ridership.[45] Applying measures to manage parking efficiently achieves the broader planning objectives of supporting more compact development, encouraging transit use, and increasing development affordability.

The Proposed Action studies where and how to manage parking as a public resource, with a particular emphasis on both long-term "park once" systems (residential or employee parking) and short-term (visitors and shopping) parking needs. When implemented, the Proposed Action will offer a menu of different types of on-street parking treatments, provide a basis for market-based pricing of parking, explore context-sensitive parking requirements for new land uses, and provide progressive measures to introduce options for shared parking resources between uses. The Proposed Action also incorporates policies to encourage long term parking management strategies at the District scale to provide more efficient utilization.

4.10.13.5 Reserved Housing

High-rise development provides a better opportunity for the provision of reserved housing than single-family unit residential development because the land and infrastructure costs for high-rise development are distributed among a greater number of units. In addition, the sale of high-priced units in a building can help offset (subsidize) the cost of the units reserved for lower income families. The cost of developing single-family units makes it difficult to achieve affordability without government subsidy. While there are successful government programs, it is clear that they alone cannot meet the demand.

The Proposed Action is intended to increase the number of reserved housing units in three fundamental ways. First, as discussed above, by adhering to the HCDA 20% Rule (20% percent of all new units constructed must be reserved for families/individuals who qualify under federal affordability guidelines), the increase in density envisioned in the Proposed Action will result in a greater number of units coming to market, and a proportionate increase in the number of those that reserved.

Second, the Proposed Action includes height and density bonuses that are intended to encourage developers to participate in the provision of reserved units. Simply put, a developer could be allowed to increase the density of a structure in exchange for what are described as "exemplary public benefits". The result is an incentive based process whereby the HCDA can achieve increased provision of reserved housing.

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[45] Litman, T. 2011. "Land Use Impacts on Travel Behavior, How Land Use Factors Affect Travel Behavior," Victoria Transportation Policy Institute.

Third, by relaxing the parking standards per dwelling unit, by untethering parking from residential units in deference to the District's proximity to rail and employment centers, and by increasing building heights (in the case of TOD Alternative A), the HCDA is attempting to bring down the development cost of units, which would result in their increased affordability. If it is possible to include more units in a building because fewer floors must be dedicated to onsite parking and more floors are allowed, then arguably the cost of constructing the building can be distributed among a greater number of units, thereby lowering the cost of each.

4.10.13.6 Displacement of Existing Residents/Tenants/Businesses

The potential transformation of the Mauka Area under either the Future Baseline Condition or the Proposed Action could result in the displacement of some existing residents and/or businesses, as the result of property redevelopment or because increasing property values may result in higher real property taxes which certain businesses may not be able to afford. This is a natural consequence of a community based redevelopment initiative. However, as discussed briefly above, the provision of new residential and commercial opportunities within the very same community will help, to some degree, to offset the negative impacts of displacement. Properties within the Sheridan Neighborhood portion of the KCDD and the Central Kaka`ako Neighborhood are particularly susceptible to this potential outcome. It may become necessary for HCDA to consider adopting measures that could aid property owners and/or tenants affected by displacement.

4.11 Infrastructure

4.11.1 Potable Water

4.11.1.1 Affected Environment

The public water system, including fire hydrants, on the island of O`ahu is owned and operated by the Honolulu Board of Water Supply (BWS). Groundwater is pumped from aquifers, treated to become potable, and stored in reservoirs located at various locations and elevations throughout the island. Transmission pipelines deliver the water from the well pumps to the reservoirs; and distribution pipelines deliver the potable water to the individual property lots/blocks.

The distribution lines within the KCDD vary in size from a minimum of 6-inch diameter to a maximum of 20-inch diameter. Further descriptions of the existing water system can be found in the Kaka'ako Community Development District "Makai Area Plan", dated October 2005 and "Final Supplemental Environmental Impact Statement, Mauka Area Plan", dated May 2009, Volume III, Appendix E - Mauka Area Infrastructure Plan (MAIP). It is noted that the extent of the water distribution system within both the Makai and Mauka Areas is quite good, with pipelines within most streets.

The Makai Area Plan and MAIP are the base documents on which the Proposed Action will be applied. As the Proposed Action affects only properties within the Mauka Area Plan, the majority of this section will focus on the Mauka Area Plan; however, Aloha Tower Special District will also reviewed.

The MAIP described the criteria and assumptions used for calculating water consumption and distribution line sizing. It provided water system performance requirements and calculated water demand. Specifically, the Year 2030 projected average daily flow was calculated as 7.15 million gallons per day (mgd).

System improvements proposed in the MAIP to address the Future Baseline Condition include:

- Replacing approximately 900 lineal feet (LF) of 12-inch diameter water main with 18-inch diameter water main from the Punchbowl 180 Reservoir to South King Street; this proposed improvement is outside of the Mauka Area.
- Replacing the existing 16-, 12-, and 8-inch diameter transmission lines from the Makiki 180 Reservoir to South King Street with approximately 6,600 LF of 18-inch diameter water main; this proposed improvement is also outside of the Mauka Area.
- Replacing approximately 1,400 LF of 12-inch diameter water main along Kapiolani Boulevard with 18-inch diameter water main.
- Replacing approximately 2,900 LF of 8-inch diameter water main along South Street with 18-inch diameter water main.
- Replacing approximately 1,000 LF of 12-inch diameter water main along Cooke Street with 18-inch diameter water main.
- Replacing approximately 1,800 LF of 12-inch diameter water main along Kamakee Street with 18-inch diameter water main.
- Replacing approximately 2,700 LF of 12-inch diameter water main along Ala Moana Boulevard with 18-inch diameter water main.

A map from the MAIP (MAIP Figure 15) depicts these improvements proposed in 2009 (see Figure 4-28). These improvements represent the Future Baseline Condition. HCDA has no schedule for the design or construction of the above-proposed improvements.

The MAIP specified that each development/redevelopment applicant must address fire flow for fire protection of the premises. It discussed water allocation and system facilities charges, specifically that projects within State lands will require a water allocation from BWS and will be required to pay Water Facility Charges for Resource Development, Transmission and Daily Storage. In addition, each applicant will be required to provide BWS with development specific water demands and associated infrastructure to address the proposed demands. BWS will determine water availability on a case-by-case basis during City Building Department permit application review. The MAIP noted that for park

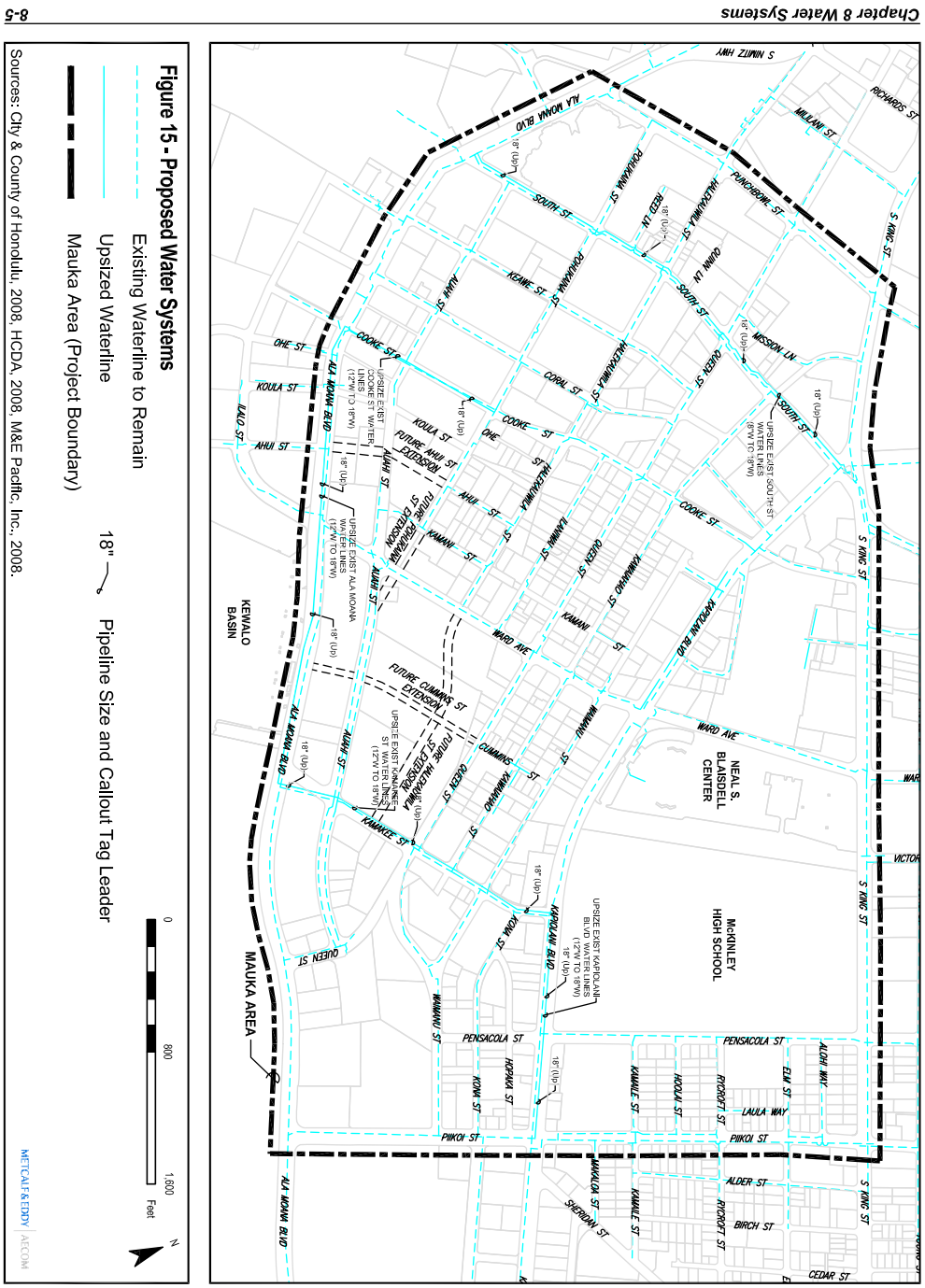
redevelopment BWS suggested that the applicant investigate the availability and use of non-potable water and to provide a report of the investigations findings.

The MAIP provided a condition assessment of the existing water system and a review of water main breaks as of October 2008. The assessment suggested that portions of the following streets might need replacement based on the break location and replacement history:

- Ala Moana Boulevard, 300 LF of 12-inch diameter main between Ward Avenue and Kamakee Street.
- Cooke Street, 400 LF of 8-inch diameter main between Kapiolani Boulevard and South King Street
- Kapiolani Boulevard, 1,400 LF of 12-inch diameter main between Ward Avenue and Kamakee Street
- Keawe Street, 560 LF of 6-inch diameter pipe between Auahi and Pohukaina Streets.
- Ward Avenue, 200 LF of 12-inch diameter pipe between Kapiolani Boulevard and South King Street.

The MAIP included BWS correspondence requesting that HCDA submit a revised water master plan to BWS.

Figure 4-28: Future Baseline Condition Water System Improvements



Since October 2008, BWS has completed the Ward Avenue 12-Inch and 8-Inch Mains project. This project installed approximately 2,400 LF of 12-inch diameter and 8-inch diameter mains and appurtenances along Ward Avenue, from Kinau Street to Kapiolani Boulevard. This was a replacement project; therefore, the abandoned water pipes remain in the road.

BWS is currently constructing the Kona Street Water System Improvements project. This project will install approximately 2,450 LF of 8-inch diameter main and appurtenances along Kona Street, from Kona Iki Street to Atkinson Drive. The estimated completion date for this project is December 2014. This is a replacement project; therefore, the abandoned water pipes are to remain in the road.

The majority of other water system improvement projects involved the installation of new meters or fire hydrants, which were done for private parcel development. Additionally, as part of the City's sewer force main project, a portion of the 12-inch diameter main within Ilalao Street (Makai Area) was relocated in year 2012.

There have been 35 water main breaks between October 2008 and April 2013. Table 4-73 summarizes the break information where there have been two or more breaks within a block. Although the cluster and number of breaks may not suggest that additional water mains require replacement, it was noted that 10 of the 35 breaks were on 6-inch and 8-inch diameter mains that were installed prior to 1960.

Table 4-73: Summary of Water Main Breaks in the KCDD from October 2008 to April 2013

Street	Crossing Streets	Remarks
Forrest Avenue	Ala Moana Boulevard and Papu Street – Makai Area	Breaks occurred on 1/9/2011 and 2/26/2011; 22 LF of 8-inch diameter (8") pipe and 8 LF of 12" pipe were replaced.
Keawe Street	Auahi and Pohukaina Streets – Mauka Area. DMAP proposed replacing this water line.	Breaks occurred on 12/19/2009 and 8/3/2010 (2 breaks); 12 LF of 6" pipe was replaced in total.
Keawe Street	Ala Moana Boulevard and Ilalao Street – Makai Area	Breaks occurred on 2/5/2010 and 9/13/2010; 14 LF of 8" pipe was replaced in total.
Koula Street	Ala Moana Boulevard and Ilalo Street – Makai Area	Breaks occurred on 1/27/2009 and 6/24/2012; 19LF of 6" pipe was replaced in total.
Auahi Street	Cooke Street and Ohe Street – Mauka Area	Breaks occurred on 11/16/2011 and 3/18/2013; repaired with clamps.
Queen Street	Ward Avenue and Cummins Street – Mauka Area	Breaks occurred on 12/28/2010 and 3/20/2012; 20 LF of 6" pipe was replaced in total.
Kona Street	Pensacola Street and Kamakee Street – Mauka Area	Breaks occurred on 7/13/2009, 12/26/2009, 10/15/2012; 23LF of 6" pipe was replaced in total.

Future planned BWS projects within the mauka area include:

- Pensacola Street Water System Improvements. This project will install: approximately 2,300 LF of 12-inch diameter main and appurtenances along Pensacola Street, from Kapiʻolani Boulevard to Young Street; and approximately 750 LF of 8-inch diameter main and appurtenances along Pensacola Street from Young Street to Kīnaʻu Street. The design is ongoing; and construction is tentatively scheduled for fiscal year 2015. This will be a replacement project; therefore, the abandoned water pipes will remain in the road.
- Ala Moana Boulevard 24-Inch Main. This project will install approximately 6,200 LF of 24-inch diameter main and appurtenances along Ala Moana Boulevard, from Ward Avenue to Atkinson Drive. Design is tentatively scheduled for fiscal year 2016; and construction is tentatively scheduled for fiscal year 2018. This will be a replacement project; therefore, the abandoned water pipes will remain in the road.
- Ala Moana Water System Improvements, Part II. This project will install:
  - Approximately 2,500 LF of 24-inch mains and appurtenances along Aloha Tower Drive, from Richards Street to S. Nimitz Highway and along Ala Moana Boulevard from S. Nimitz Highway to Keawe Street.
  - Approximately 810 LF of 8-inch diameter main and appurtenances along Keawe Street and Koula Street, from Ala Moana Boulevard to Ilalo Street. Design is tentatively scheduled for fiscal year 2016; and construction is tentatively scheduled for fiscal year 2018. This will be a replacement project; therefore, the abandoned water pipes will remain in the road.
- Honolulu District 42-Inch Mains - Liliha to Moiliili (Phase I). This project will install approximately 11,000 LF of 42-inch diameter main: along Beretania Street, from Liliha Street to Richard Street; along Richard Street, from Beretania Street to King Street; along King Street, from Richard Street to Victoria Street; and along Victoria Street, from King Street to Kīnaʻu Street. Design is tentatively scheduled for fiscal year 2017; however, there is no construction schedule. This will be a new main project; therefore, any existing water pipes within the road will remain in service.
- Honolulu District 42-Inch Mains - Liliha to Moiliili (Phase II). This project will install approximately 9,000 LF of 42-inch diameter main along King Street, from Victoria Street to Isenberg Street. Design is tentatively scheduled for fiscal year 2018; however, there is no construction schedule. This will be a new main project; therefore, any existing water pipes within the road will remain in service.

In addition, the BWS is proposing to install approximately 1,040 LF of 20-inch diameter main along Cooke Street from Ala Moana Boulevard to the intersection with Kapiolani Boulevard as part of a future BWS project (Honolulu Water System Improvements) that will require an Environmental Assessment.

4.11.1.2 Potential Impacts and Recommended Measures to Mitigate Them

As part of planning for the Proposed Action, the water master plan was updated for the Kakaʻako Mauka Area and Aloha Tower Special District (see Appendix J). A summary of the Water Master Plan Update is provided below.

At the request of BWS, a study was undertaken to review consumption rates based on recent water meter billing records, which resulted in the proposed consumption rates in Table 4-74, below.

Table 4-74: Estimated KCDD Water Consumption Rates Under the Proposed Action

Land Use	Current Average Daily Consumption Rate	Proposed Average Daily Consumption Rate
Single Family Residential	500 gallons/unit	500 gallons/unit
Multifamily Residential	400 gallons/unit	200 gallons/unit
Civic / Office	n/a	120 gallons/1,000 square feet (sf)
Commercial/Restaurant	69 gallons/1000 sf (3,000 gallons/acre)	300 gallons/1000 sf (13,100 gallons/acre)
General/Light Industry	92 gallons/1000 sf (4,000 gallons/acre)	92 gallons/1000 sf (4,000 gallons/acre)
School	60 gallons/student	60 gallons / student

Applying these consumption rates and planned Howard Hughes Group (HHG) developments as provided by Wilson Okamoto Corporation (see Appendix J) resulted in the following estimated average daily consumption rates:

Future Baseline condition: 6.74 million gallons per day (MGD)
TOD Alternative A: 7.85 MGD
TOD Alternative B: 7.54 MGD

The existing water distribution system was modeled; however, the following improvements were included when evaluating future development scenarios:

- Ward Avenue – BWS completed replacement of an existing 12-inch diameter main with a new 12-inch diameter main and a new 8-inch diameter main from Kapiʻolani Boulevard to Kīnaʻu Street.
- Ala Moana Boulevard – BWS planned replacement of the existing 12-inch diameter main with a new 24-inch diameter main from Aloha Tower Drive to Kalākaua Avenue.
- Cooke Street – BWS planned replacement of the existing 12-inch diameter main with a new 20-inch diameter main from Ala Moana Boulevard to Pohukaina Street.
- Queen Street – HHG planned replacement of the existing 6-inch diameter main with a new 12-inch diameter main from Cooke Street to the existing 12-inch diameter main located between Cummings Street and Kamakee Street.

An analysis of the water distribution system was conducted using the following planning criteria from the *Water System Standards:*

- Pipelines shall be sized to accommodate maximum daily flow plus fire flow with a minimum residual pressure of 20 pounds per square inch (psi) at fire hydrants;
- Fire flow for the entire KCDD shall be 4,000 gallons per minute (gpm); as the KCDD is envisioned to be a densely developed area similar to Waikīkī or downtown Honolulu;
- Pipelines shall be sized to accommodate peak hour flow with a minimum residual pressure of 40 psi; and
- The maximum velocity in distribution mains without fire flow shall be 6 feet per second.

The analysis results were as follows:

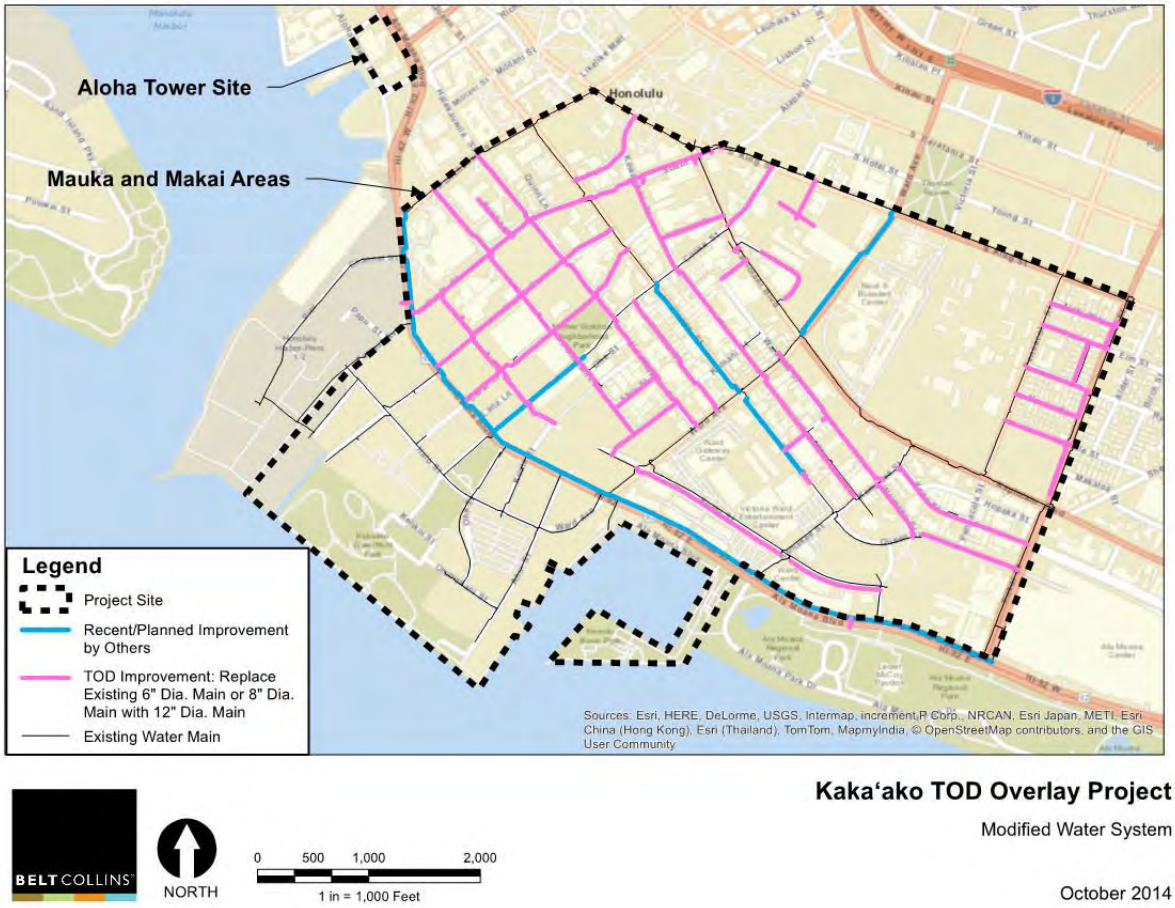
- The modeled water distribution system is adequate to meet the peak hour domestic demands for all scenarios.
- The modeled water distribution system is inadequate to meet the fire flow requirement. Specifically, fire hydrants along existing 6-inch diameter water mains do not have adequate residual pressure to support a 4,000 gpm fire flow; and the flow velocities in the 6-inch and 8-inch diameter water mains were well above the generally accepted maximum velocity of 10 feet per second. By replacing all 6- and 8-inch diameter water mains with 12-inch diameter mains, the resulting analysis showed that the modified water system is adequate to meet the fire flow requirements. The modified water system is shown on the following page.

Since the replacement of all 6-inch and 8-inch diameter water mains with 12-inch diameter mains is not a BWS or HHG planned improvements, the cost of the approximately 37,600 linear feet replacement needs to be borne by the developments within the KCDD. The estimated cost of this replacement is $41,900,000.

The existing KCDD Mauka Area water system as modified by planned BWS and HHG system improvements and the suggested replacement of approximately 37,600 linear feet of existing 6- and 8-inch diameter mains with new 12-inch diameter mains will be capable of meeting both peak hour domestic consumption demand requirement and 4,000-gpm fire flow requirement. (see Figure 4-29)

No additional "regional" water system improvements are required specifically to support the system. However, all developments need to pay their fair share portion of the 6-inch and 8-inch to 12-inch diameter water main replacement cost.

Figure 4-29: Water System Modifications Required by Proposed Action



4.11.2 Wastewater Collection and Disposal

4.11.2.1 Affected Environment

Wastewater is collected by a system that consists of gravity mains, wastewater pump stations (WWPS) and sewer force mains. Wastewater from the KCDD area is conveyed to the Ala Moana WWPS, located on Keawe Street; a 60-inch diameter and a 78-inch diameter force main then conveys the wastewater to the Sand Island Wastewater Treatment Plant (WWTP), located on Sand Island, between the Honolulu International Airport and downtown Honolulu, for treatment and disposal. The City Department of Environmental Services (City ENV) maintains the sewer system; and the City Department of Planning and Permitting Wastewater Branch (City DPP-WB) is responsible for planning and design of the sewer system. It also manages sewer connection requests.

The sewer system within the KCDD consists of a combination of: local collection mains, from 6-inch up to 14-inch diameter pipe, and regional trunk/relief sewers, from 18-inch

to 78-inch diameter pipe. Further descriptions of the existing sewer system can be found in the KCDD Makai Area Plan and Mauka Area Infrastructure Plan (MAIP). It is noted that the extent of the sewer system within both the Makai and Mauka Areas is quite good, with sewer lines within most streets.

The Makai Area Plan and MAIP are the base documents on which Proposed Action will be applied. As the Proposed Action affects only properties within the Mauka Area Plan, the majority of this section will focus on the Mauka Area Plan; however, Aloha Tower Special District was also reviewed.

The MAIP described the criteria for calculating wastewater flow and calculated wastewater demand. Specifically, the base year 2030 used in the MAIP projected flows were calculated as:

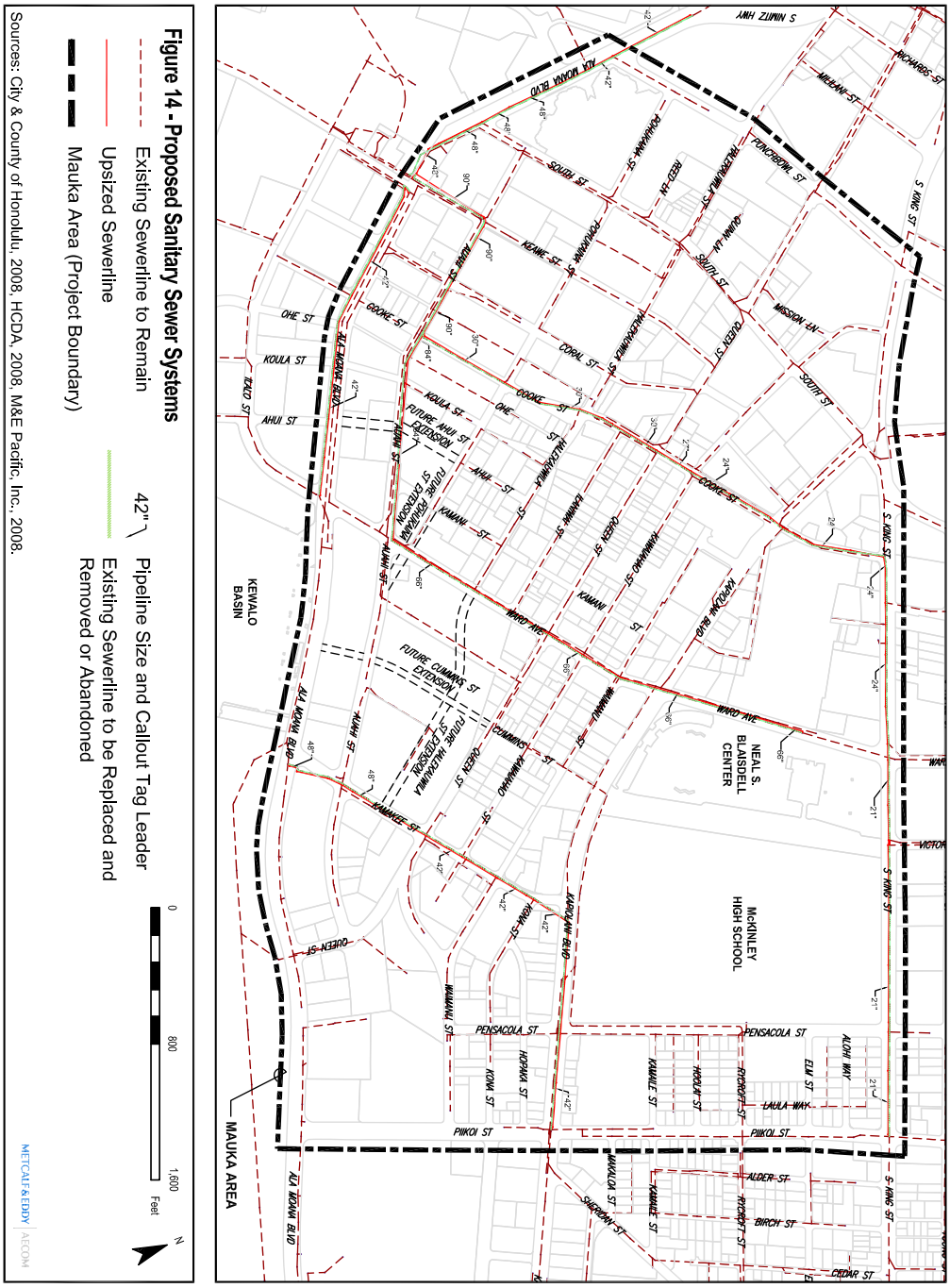
- 28.7 million gallons per day (MGD) average wastewater (sewage) flow
- 172 MGD design peak flow

System improvements proposed in the MAIP to address the Future Baseline Condition include:

- Replacing the existing 34- to 36-inch diameter pipes along Ala Moana Boulevard:
  - From Punchbowl Street to Ward Avenue with 150 LF of 36-inch diameter pipe and 1,200 LF of 48-inch diameter pipe.
  - From Ward Avenue to Keawe Street with 1,900 LF of 48-inch diameter pipe.
- Replacing the existing 16- to 18-inch diameter pipes along South King Street from Cooke Street to Piikoi Street with 2,300 LF of 21-inch diameter pipe and 1,100 LF of 24-inch diameter pipe.
- Replacing the existing 18- to 24-inch diameter pipes along Cooke Street from South King Street to Auahi Street with 1,200 LF of 24-inch diameter pipe, 250 LF of 27-inch diameter pipe, and 1,600 LF of 30-inch diameter pipe.
- Replacing approximately 83% of the existing 60-inch diameter pipes along Ward Avenue between Auahi Street to South King Street with 2,600 LF of 66-inch diameter pipe.
- Replacing the existing 36-inch diameter pipes along Kapiolani Boulevard from Piikoi Street to Kamakee Street and along Kamakee Street to Auahi Street with 330 LF of 48-inch diameter pipe and 2,440 LF of 42-inch diameter pipe.
- Replacing the existing 78-inch diameter pipe along Auahi Street from Ward Avenue to Keawe Street and down Keawe Street to Ala Moana Boulevard with 1,200 LF of 84-inch diameter pipe and 1,200 LF of 90-inch diameter pipe.

A map from the MAIP (MAIP Figure 14) depicts the sanitary sewer system improvements proposed in 2009 (see Figure 4-30). These improvements represent the Future Baseline Condition. HCDA has no current schedule for the design or construction of any of the proposed improvements.

Figure 4-30: Future Baseline Condition Sewer System Improvements



The MAIP discussed the City ENV regulation of industrial wastewater discharges pursuant to the Revised Ordinances of Honolulu (ROH) Chapter 11, which requires that all wastewater plans be submitted to the State Department of Health for approval. It requires all new or renovated development applicants of the requirement to submit a "Site Development Division Master Application Form", with at least the sewer connection permit checked. Other possible permit requirements and the sewer system design standards were also discussed.

The MAIP provided a condition assessment of the existing sewer systems.

- Based on the results of the City's 2009 closed-circuit television (CCTV) inspection videos, it was concluded that no sewer line segments required rehabilitation or replacement based solely on condition.
- The accumulation of fats, oils and grease (FOG) was identified as a major concern as the buildup of FOG within sewer pipes would reduce the pipe's available cross-sectional area and subsequently reduce the amount of flow that could pass through the pipe. Coordination with the City to mitigate FOG buildup was suggested.

The MAIP included City DPP correspondence stating that a wastewater master plan is required and that the submittal and review of the wastewater master plan could be separate from the EIS review process.

With regard to future projects, upon receipt of the "Site Development Master Application for Sewer Connection", the City DPP-WB will determine if adequate sewer capacity is available for the proposed improvements. Permission to connect to the City's sewer system will either be granted unconditionally, or if a deficiency exists, granted on the condition that the developer makes certain off-site improvements.

All new connections to the City's sewer system will incur a Wastewater System Facility Charge (WSFC) in accordance with the Revised Ordinances of Honolulu, Chapter 14, Article 10. The WSFC is a function of the number of units for a residential development and the size of the potable water meter for non-residential units. An equivalent single-family dwelling unit count (ESDU) is computed for the proposed development. Each ESDU carries a dollar amount, varying with the type of development and the year assessed. The construction cost of an off-site improvement may be credited against the WSFC provided the improvement will be a benefit to the general population, not just the individual development.

Since preparation of the MAIP (January 2009), system conditions have been evaluated. The Ala Moana WWPS presently has the following operating characteristics:

- Peak design flow: 142.85 million gallons per day (MGD)[46]

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[46] Peak design flow and average design flow reference:
metro: http://www1.honolulu.gov/env/wwm/plants/sandisland.pdf

- Average design flow: 65.71 MGD
- Maximum daily flow (between August 2, 2011 and July 21, 2013): 98.3 MGD, March 6, 2012[47]
- Minimum daily flow (between August 2, 2011 and July 21, 2013): 33.5 MGD, October 17, 2011
- Peak flow during December 2010 rain events: 106.5 MGD, December 19, 2010[48]

The City ENV had no reported sewage spills within the January 2011 to November 2012 timeframe.

A current project by the City ENV project to CCTV inspect sewer lines within the Kaka`ako Area is nearing completion. The City ENV is currently reviewing the "Gravity Sewer Assessment Program Draft Preliminary Sewer Assessment Report for the Kakaako Area" dated June 29, 2012. The Report's Table 9 identified sewer lines recommended for replacement/upsizing within the following KCDD streets: Punchbowl Street (1 area); Auahi Street (2 areas); Kapiolani Boulevard (3 areas); Ward Avenue (2 areas); Halekauwila (1 area); South King Street (1 area); and Piikoi Street (3 areas). Of all the above noted recommendations, only 235 linear feet of 6-inch diameter main within Halekauwila Street was recommended to be upsized to a minimum 8-inch diameter main.

The City ENV's six-year capital improvement projects and budget for fiscal year 2013 to 2018 include the following projects within the KCDD:

- Kapiolani Area Revised Sewer System. The existing 36-inch diameter line along Kapiolani Boulevard from Kalakaua Avenue to Kamakee Street was rehabilitated; work was completed in October 2009.
- Ala Moana and Kapiolani Trunk Sewer Replacement/Rehabilitation.
    - The existing 69-inch diameter line along Ala Moana Boulevard from Ward Avenue to Keawe Street was rehabilitated; work was completed in April 2012.
    - A second project to rehabilitate the existing 69-inch diameter line along Ala Moana Boulevard from Ala Moana Beach Park to Ward Avenue is scheduled to be completed in December 2014.
- Ala Moana Boulevard/Auahi Street Sewer Rehabilitation.
    - The existing 6-feet by 6-feet box line rehabilitation along Auahi Street from Ward Avenue to Keawe Street is scheduled to be completed in December 2014. NOTE: the MAIP proposed upsizing this line to an 84-inch or 90-inch diameter line.
    - The existing 6-feet by 6-feet box line rehabilitation along Keawe Street from Auahi to Ala Moana Boulevard is currently under construction, no completion date is available. NOTE: the MAIP proposed upsizing this line to a 90-inch diameter line.

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47 Maximum and minimum daily flow data obtained from City ENV on July 22, 2013.

48 Hourly flow data for the month of December 2010 obtained from City ENV on July 22, 2013.

    - The existing 14-inch diameter line along Ward Avenue from Auahi to Ala Moana Boulevard was rehabilitated; work was completed in August 2011.
    - The existing 36-inch diameter line along Ala Moana Boulevard from Ahui Street to Keawe Street was rehabilitated; work was completed in April 2012. NOTE: the MAIP proposed upsizing this line to a 48-inch diameter line.
- Ala Moana Wastewater Pump Station Force main No. 2 Rehabilitation. Spot repairs were performed on the existing force main; substantial completion was issued on August 2012.
- Ala Moana Wastewater Pump Station Force Mains No. 3 and 4. New force mains will be installed from the Ala Moana WWPS to the Sand Island WWTP to provide back-up capacity and convey projected peak wet weather flows. The project is scheduled to be completed in May 2015.
- Ala Moana Park Wastewater Pump Station and Alternatives. A proposed new WWPS near the Diamond Head entrance to Ala Moana Park, or alternative site along the route from Ala Moana Park to Kaka'ako will be evaluated. This project is still in the planning phase; the planning phase is scheduled to end in January 2014.
- Ala Moana Wastewater Pump Station Upgrade. Upgrade the WWPS capacity from 167 MGD to the projected peak flow, is still under evaluation. The project's planning phase is scheduled to begin January 2013 and end January 2016.

It is noted that of the above listed capital improvement projects only the Ala Moana Wastewater Pump Station Force Mains No. 3 and 4 project increased the City's sewer capacity.

The City ENV prepared the "Sand Island Wastewater Treatment Plant & Sewer Basin Facilities, Phase 1 Area, Oahu, Hawaii Final Environmental Assessment/Environmental Impact Statement Preparation Notice" (Sand Island WWTP EISPN) dated January 2010[49]. The Sand Island East Sewer Tunnel is one of four gravity sewer tunnel (GST) alignments being considered in the Sand Island WWTP EIS PN. The GST would extend from the Sand Island WWTP to Moana Park pump station (located at the east end of Ala Moana Beach Park) along one of three routes; all routes would traverse through the Kaka`ako Makai Area. The Sand Island WWTP EIS PN does not mention any projects within the Kaka`ako Mauka Area.

Per HCDA's June 18, 2013 meeting with City ENV and City Department of Design and Construction, Wastewater Division (City DDC-WD), additional information regarding the City's wastewater plans and operations were provided. Specifically:

[49] The Sand Island WWTP EIS-PN evaluated alternatives for upgrading and improving the major conveyance infrastructure in the Sand Island WWTP service area and the hydraulic capacity at the Sand Island WWTP to meet the service demands to year 2030 and beyond.

- City ENV, City DDC-WD and City DPP-WB has been collaborating to address future wastewater needs and plans for subsequent wastewater improvements for TOD projects.
- City ENV will be replacing its current "static" wastewater flow calculation model (INFIX) with a "dynamic" model produced by InfoWorks®. The new dynamic model will incorporate rainfall radar imagery and address rainfall runoff attenuation/lag.
- A preliminary alignment of the Makai Relief Sewer Corridor (mentioned in the Sand Island WWTP EIS PN as the Sand Island East Sewer Tunnel) and a Mauka Relief Sewer Corridor was provided to HCDA. The Mauka Relief Sewer Corridor is being proposed to accommodate additional sewer flows generated within the Mo`ili`ili area should the Rail project extend beyond Ala Moana. Completion of the Mauka Relief Sewer Corridor is required by year 2020 as an alternative to the Amended Consent Decree requirement to upgrade the Fort DeRussy WWPS or implement an alternative project.
- The City ENV is currently refining the proposed alternatives information, including alignment/location, for inclusion in the subsequent Sand Island WWTP Environmental Impact Statement.
- The following sewer system constraints were noted:
    - Sand Island Wastewater Treatment Plant (WWTP)[50].
        - Currently there is only one digester at the Sand Island WWTP; therefore, the system has a solids processing constraint.
        - As City ENV and City DDC-WD have only recently received the 2009 Kaka`ako MAIP, the City ENV has neither reviewed the Plan improvements nor has the City ENV included the 2009 MAIP's projected increased sewer flow into their Sand Island WWTP capacity projections.
    - No outfall issues were noted. City ENV stated that it does annual condition assessments of the outfalls.
- Other sewer system notes:
    - City ENV will investigate whether Ala Moana WWPS capacity upgrades are necessary to accommodate the additional development being proposed by both the Ala Moana and Kaka'ako TOD Overly projects.

When the City relined the 69-inch diameter main within Ala Moana Boulevard, it noticed that the 36-inch diameter main within Ala Moana Boulevard had minimal flow; as such the City abandoned the 36-inch diameter main within Ala Moana Boulevard.

4.11.2.2 Potential Impacts and Recommended Measures to Mitigate Them

As part of the Proposed Action, the sewer master plan was updated for the Kaka'ako Mauka Area and Aloha Tower Special District (see Appendix K). A summary of the Sewer Master Plan Update is provided below.

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50 The Sand Island WWTP service area encompasses the area from Salt Lake to Niu Valley.

The land use categories and corresponding average daily flow used to generate wastewater flow are provided in Table 4-75, below.

Table 4-75: Methodology for Sewage Flow Rates

Use	Unit Capita	Unit	Average daily flow rate (gpd)
SF Residential	4 residents	Dwelling	80
MF Residential	2.8 residents	Dwelling	80
Civic / Office	300 employees	Acre	25
Retail	140 employees	Acre	25
General/Light Industry	100 employees	Acre	25
Parking Structure	1 employee	Each	25
School	1 student	Per 80 sf	25
Restaurant	1 cover	Per 25 sf	5 gal/cover @ 6 services per day
Cinema	Metered water consumption rates used in lieu of population estimates based on patronage.		

Applying these rates resulted in the following average daily flow rates:

Future Baseline condition: 5.3 MGD
TOD Alternative A: 6.5 MGD
TOD Alternative B: 6.2 MGD

The existing sewer system was modeled; however, for the Future Baseline and TOD Alternative A scenarios[51], the following Howard Hughes Group (HHG) proposed improvements were also included:

- Install a 24" relief sewer in Ward Avenue between Ilaniwai and Auahi Streets;
- Reroute the 48" trunk sewer from under the Ross Dress for Less and Sports Authority stores into Ward Avenue;
- Replace the 6" sewers in Pohukaina Street between Koula and Ward Avenue with 12" sewers;
- Install a 36" sewer in Auahi Street between Kamakee Street and Ward Avenue; and
- Replace the 8" sewer in Auahi Street between Kamakee Street and Queen Lane with a 12" sewer.

[51] As TOD Alternative B resulted in a marginal decrease in flow from the TOD Alternative A, TOD Alternative B was not analyzed separately; any TOD Alternative B improvements would also be required for TOD Alternative A.

As the analysis resulted in surcharged sewers in the Existing, Future Baseline Condition, and TOD Alternative A scenarios, the following mitigative measures were included in the sewer system model:

Future Baseline Condition:

- Replace 480 LF of 10" sewer on Pohukaina Street between South and Keawe Streets with a 12" sewer; and
- Upsize 305 LF of HHG's planned sewer in Pohukaina Street between Ahui Street and Ward Avenue from 12" to 18" diameter.
- City's proposed diversion of sewage flows from the 60" Ward Avenue trunk sewer; a minimum of 27 MGD was used in the analysis.

See Future Baseline Sewer System Figure 4-31.

TOD Alternative A:

- Replace 480 LF of 10" sewer on Halekauwila Street between South and Keawe Streets with a 12" sewer;
- Replace 310 LF of 8" sewer on Keawe Street makai of Halekauwila Street with a 12" sewer;
- Replace 250 LF of 6" sewer on Ilaniwai between Kamani Street and Ward Avenue with an 8" sewer; and
- Upsize 305 LF of HHG's planned sewer in Pohukaina Street between Ahui Street and Ward Avenue from 12" to 18" diameter to 24" sewer in Ward Avenue. Sewer demands from Blocks 48N and 55 (KS D) are redirected to this line as the adjacent 6" and 8" sewers are inadequate.

See TOD Alternative A Sewer System Figure 4-32.

The analysis results indicated that, even with the proposed diversion and sewer system improvements in place, a number of existing branching sewer mains would remain surcharged. (Under ideal conditions the top of a branching sewer is typically set at an elevation equal to the top of the trunk sewer to minimize surcharging of the branching sewer.) The branch sewer profiles suggest external factors such as a conflicting utility precluded a higher invert connection or larger pipe diameter; therefore, surcharging of the branching sewers is practically unavoidable. The following branching sewers will remain surcharged as a result of connecting to the trunk sewer at or near the trunk sewer invert:

- The 8" sewer, ID 4065997, at the intersection of Auahi and Coral Streets;
- The 24" sewer, ID 3014925, at the intersection of Cooke and Auahi Streets;
- The 30" sewer, IDs 685449, 685488, and 3010720, on Auahi Street between South and Keawe Streets;

Figure 4-31: Future Baseline Condition Sewer System

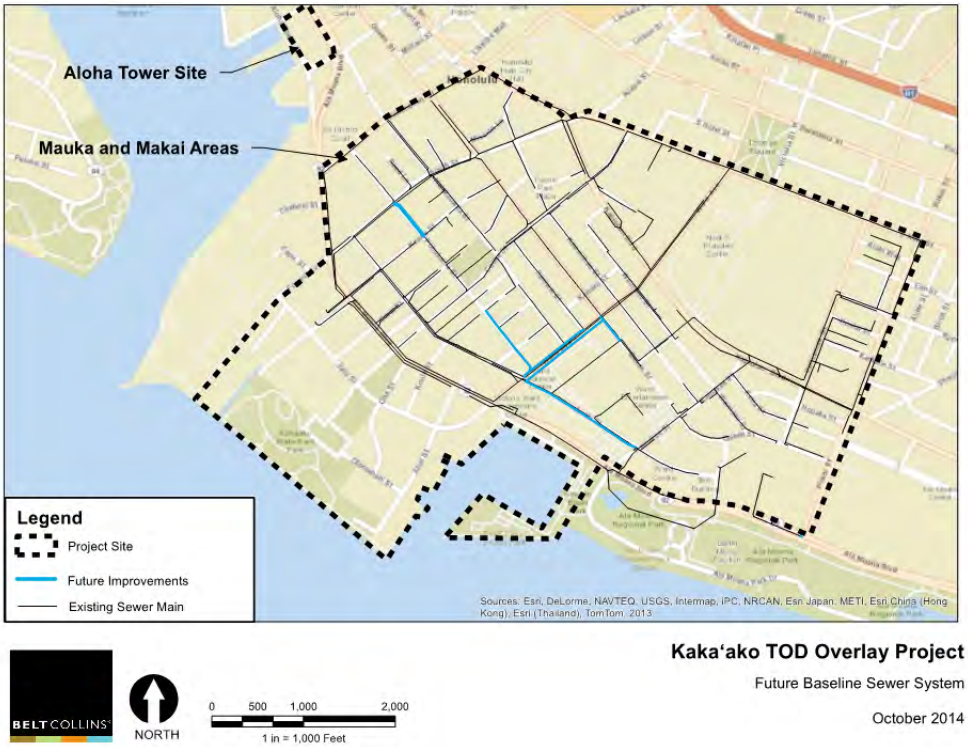
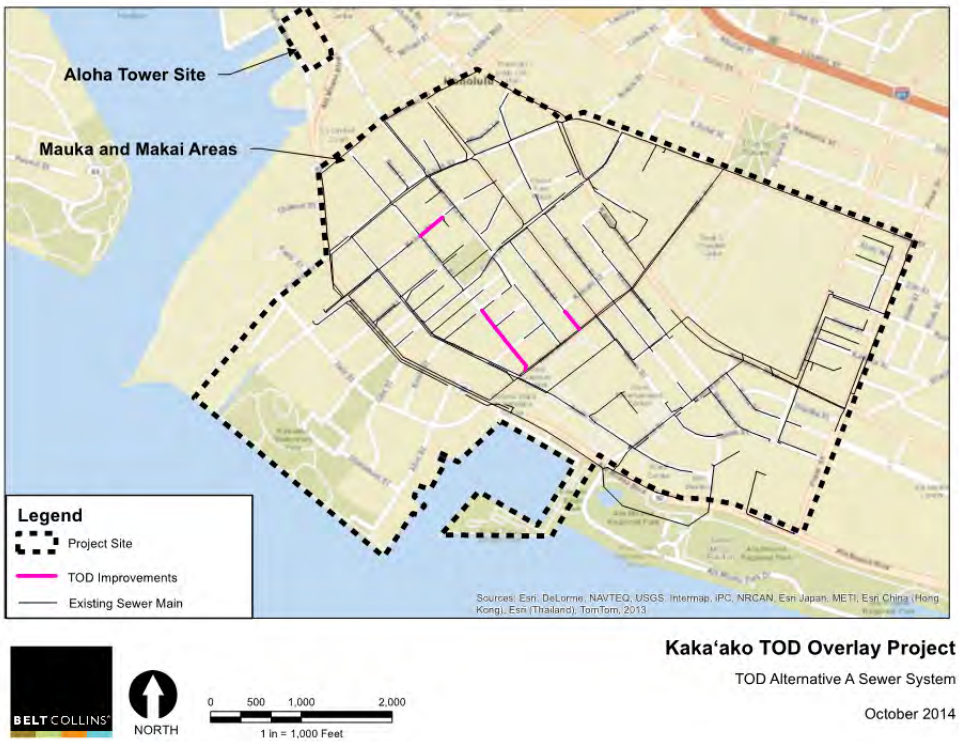


Figure 4-32: TOD Alternative A Sewer System



- The 10" sewer, ID 4026585, at the intersection of Halekauwila and Cooke Streets;
- The 6" sewer, ID 344232, at the intersection of Archer Lane and South Beretania Street;
- The triple barrel 12" sewers, ID 3015527, at the intersection of Kapiʻolani Boulevard and Pensacola Street;
- The 21" sewer, ID 380522, on Kapiʻolani Boulevard, just west of Pensacola Street; and
- The 8" sewer, ID 4047070, 12" sewer, ID 4046376, and 18" sewer, ID 2023300 connecting to the 36" Kamakeʻe Street sewer.

The costs for the non-City or HHG proposed improvements are:

- Future Baseline improvements: $3,400,000
- TOD Alternative A improvements: $1,100,000
- Total sewer improvement cost: $4,500,000

The existing KCDD Mauka Area sewer system as modified by planned HHG system improvements and Future Baseline Condition and TOD Alternative proposed improvements will be capable of meeting peak hour flow requirements. Surcharged conditions will, however, continue to be experienced in branch sewers, but given the sewer line depths, spills will not occur.

The previously noted City's Mauka Relief Sewer Corridor project will significantly impact the Mauka Area's wastewater master plan. Per discussion with City ENV, the City does not have a schedule for completing the Mauka Relief Sewer Corridor. ENV acknowledged that the project is behind schedule and that they will need to complete the improvements by year 2020, implement an alternative project, or request to extend the completion date.

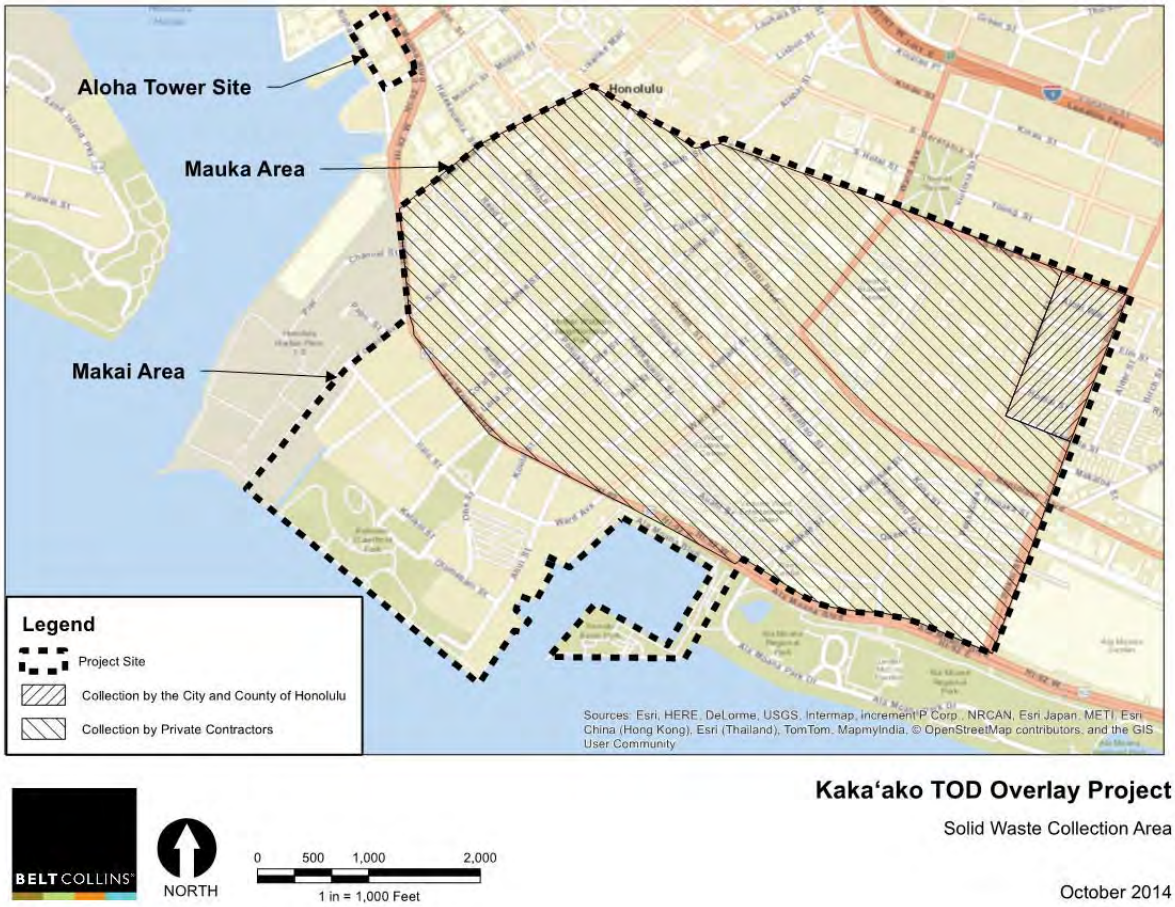
A sewer connection application was submitted for the Aloha Tower Special District (ATS), and on October 12, 2013 the application was approved by DPP-WB. Therefore no additional sewer improvements are required for this property.

4.11.3 Solid Waste Collection and Disposal

4.11.3.1 Affected Environment

Solid waste is trash/rubbish generated by residences and businesses. The City Department of Environmental Services Refuse Division (City ENV-RD) manages the collection, disposal and recycling operations for the majority of residences in the Mauka Area. The City ENV-RD does not collect solid waste generated by businesses or commercial developments; private contractors service them. Figure 4-33 depicts the solid waste collection areas serviced by City ENV-RD and by private contractors.

Figure 4-33: Solid Waste Collection Area



The City ENV-RD collects solid waste twice a week, on Tuesday and Friday. Private contractors that currently collect solid waste from the Mauka Area for disposal include Rolloffs Hawaii and Honolulu Disposal Service.

The City ENV-RD does not collect industrial or hazardous waste; such as hazardous chemicals, paint, used oil, propane tanks, batteries, etc. Information on what can be recycled and disposal instructions is available in the City's website: http://www.opala.org/solid_waste/what_goes_where_table.html#electronic Generators of waste that cannot be taken to a City facility need to contract with appropriately licensed contractors to dispose of industrial or hazardous waste.

There are no existing or proposed solid waste disposal facilities located within the Mauka Area. All collected solid waste is disposed of outside of the Mauka Area; at refuse transfer stations, recycling centers, composting/mulch sites, the Waimānalo Gulch Sanitary Landfill, the H-POWER plant in Campbell Industrial Park, other State Department of Health permitted facility, such as the PVT Landfill in Nanakuli.

4.11.3.2 Potential Impacts and Recommended Measures to Mitigate Them

No modifications to the solid waste disposal program within the Mauka Area are proposed. Expansion of private contractor provided collection services might be required to meet future increased demands.

4.11.4 Drainage

4.11.4.1 Affected Environment

Storm water runoff is collected by a drainage system that consists of catch basins, drain inlets, and road curb inlets, discharging to open drainage channels or underground conduits that outlet to the ocean. The City Department of Facilities Maintenance (City DFM) maintains the storm drain system; and the City Department of Planning and Permitting Civil Engineering Branch (City DPP-CEB) is responsible for planning and design of the storm drain system and manages storm drain connection requests.

The underground storm drain conduits within the Kaka`ako Community Development District (KCDD) road rights-of-way are a combination of circular pipes ranging from 18-inch to 72-inch diameter and box culverts ranging from 2.5-feet by 1.25-feet to 16-feet by 9-feet. Further descriptions of the existing storm drain system can be found in the KCDD Makai Area Plan dated October 2005 (Makai Area Plan) and Final Supplemental Environmental Impact Statement for the Revisions to the Kaka'ako Community Development District, Mauka Area dated May 2009, Volume III, Appendix E - Mauka Area Infrastructure Plan (MAIP). It is noted that within both the Makai and Mauka Areas storm drain lines are within most streets.

4.11.4.2 Potential Impacts and Recommended Measures to Mitigate Them

The Makai Area Plan and MAIP are the base documents utilized to determine impacts and measures that may be necessary to mitigate them. The MAIP describes the criteria to calculate rainfall runoff and states that the existing major trunk drain lines would discharge an estimated 2,500 cubic feet per second of rainfall runoff to the ocean.

System improvements proposed in the MAIP to address the Future Baseline Condition include:

- Locations recommended to receive pavement resurfacing to relieve identified substantial ponding concerns; specific locations listed were:
  - Waimanu Street between Ward Avenue and Kamakee Street
  - Cummins Street between Waimanu Street and Queen Street
  - Hopaka Street between Kona Street and Pensacola Street
  - Kona Street between Kamakee Street and Piikoi Street
- Locations recommended to receive drain inlets and/or catch basins to relieve more frequent, day-to-day, rainfall events; specific locations listed were:
  - Waimalu Street between Drier Street and Kamakee Street

- Kawaiahao Street between Cooke Street and Kamakee Street
- Queen Street between Cooke Street and Kamakee Street
- Ilaniwai Street between Cooke Street and Ward Avenue
- Halekauwila Street between Cooke Street and Ward Avenue
- Koula Street between Halekauwila Street and Pohukaina Street
- Ahui Street between Halekauwila Street and Pohukaina Street
- Kamani Street between Halekauwila Street and Pohukaina Street
- Kona Street between Kamakee Street and Pensacola Street
- Hopaka Street between Kona Street and Pensacola Street
- Cooke Street between Kapiolani Boulevard and South King Street.
- Mission Lane between Queen Street and Kawaiahao Street.

A map from the MAIP (MAIP Figure 13) depicts these storm drainage improvements proposed in 2009 (see Figure 4-34). These improvements represent the Future Baseline Condition. HCDA has no current schedule for the design or construction of any of the proposed improvements.

The MAIP concludes that the existing drainage system is inadequate to accommodate and dispose of design storm rainfall runoff quantities in both the existing and future conditions. However, it is noted that since most of the future improvements were anticipated to be vertical development, additional rainfall runoff, due to development, was anticipated to be negligible; and as such, surface water ponding concerns and existing drainage system inadequacies would not be exacerbated. In other words, while the existing drainage system has deficiencies, the Proposed Action will not exacerbate them. The actions identified above are intended to relieve the existing system deficiencies.

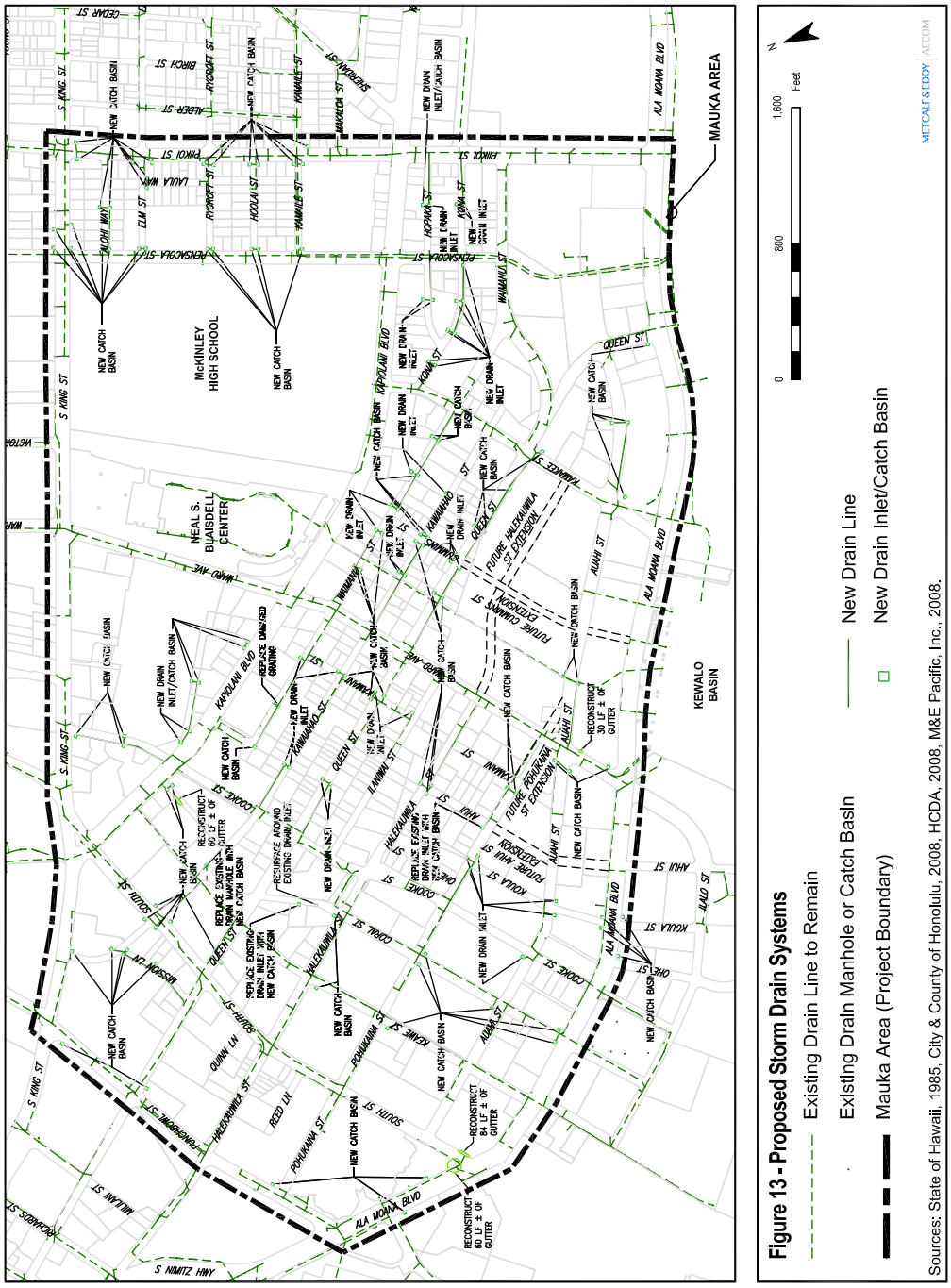
The MAIP also notes that future runoff quantities can be reduced through the implementation of:

- The capture and reuse of rainwater, specifically capture, store and use runoff as a non-potable water source for the building and irrigation.
- Reduction of impermeable surfaces, specifically, the installation more landscaping.
- The optimization of impermeable surfaces; specifically the construction of smaller, multi-level parking structures.
- The use of more evapotranspiration; specifically install more landscaping.

The MAIP identifies Federal, State and City regulations requiring storm water quality treatment and lists the following possible license/permit requirements for new projects:

- Drainage Connection License, if connecting to the City's storm drain system.
- Trenching permit for work within the City's rights-of-way.
- Dewatering permit for discharging dewatering effluent into the City's municipal separate storm sewer system (MS4).

Figure 4-34: Proposed Storm Drain System Improvements (Future Baseline Condition)



The MAIP includes the following project requirements:

- Wastewater plans meeting the State Department of Health (DOH), Hawaii Administrative Rules (HAR) Chapter 11-62 "Wastewater Systems".
- Comply with the Anti-degradation policy outlined in HAR, Section 11-54-1.1.
- Conform to designated uses as outlined in HAR, Section 11-54.3;
- Conform to water quality criteria outlined in HAR, Sections 11-54.4 through 11-54-8.
- Obtain National Pollutant Discharge Elimination System (NPDES) general permit, if required.

The MAIP provides a condition assessment of the existing storm drain systems. The MAIP concluded that the existing major drainage structures are satisfactory. However, the MAIP noted that, during a field inspection, a significant amount of debris and litter was observed in the storm drain along Keawe Street, between Auahi Street and Ala Moana Boulevard; and stressed that the City schedule on-going periodic maintenance to remove the debris/litter from major drainage structures to mitigate runoff from backing up into the street and sidewalks, which could become a hazard to motorists and pedestrians.

It is noted that there are several items that are not addressed in the MAIP due to its 2009 publication date. Specifically, the City has revised several design requirements that include the following:

- The City DPP-CEB reviews proposed development construction plans to ensure that: neighboring properties are not adversely impacted by runoff generated from the proposed development; and impacts to the environment from storm water borne pollutants are minimized. The basis for this review is the *Rules Relating to Storm Drainage Standards*, January 2000; the current amendment became effective on June 1, 2013.
- Proposed developments must demonstrate that the proposed improvements will not discharge runoff to the municipal system in excess of the current condition, commonly referred to as a "no net increase" in runoff. Any increase in storm water runoff in excess of the existing condition is typically retained or disposed of on-site.
- A related component of storm water runoff managed by the CEB is storm water quality, under the City's MS4 NPDES Permit. The purpose is to minimize the quantity of pollutants entering the municipal drain system and ultimately the ocean through the use of Best Management Practices, or BMPs. The treatment criteria and means to provide treatment vary depending on the type and size of development. BMP measures could include vegetated swales or structural BMPs such as a hydrodynamic separator, targeting solid pollutants including dirt, road dust, litter, and vegetative debris.
- Effective June 2013, the City implemented a more rigorous storm drainage standard that included standards for storm water quality program, which included

Low Impact Development (LID) principles specific to storm water runoff. Targeted pollutants will now include liquid contaminants such as petroleum/hydrocarbon by-products. Developments will be required to retain storm water runoff on-site through the use of infiltration or rain harvesting methods, or may be allowed to discharge runoff through an appropriate bio filter such as a rain garden, green roof, or tree box filters.

4.11.5 Electrical Utilities

4.11.5.1 Affected Environment

Hawaiian Electric Co.'s (HECO) existing generation system, on the Island of Oahu, is currently capable of providing approximately 1,321 Megawatts (Mw) of power with independent power producers capable of providing an additional 456 Mw of power for a total generating capacity of 1,778 Mw (based on 11 April 2014 Availability of Supply letter). Current peak demand on the Island of Oahu, as of December 2013, was 1,175 Mw.

Four existing HECO substations presently serve the Mauka Area: Kewalo Substation, located on Kona Street between Kamakee and Piikoi Streets; Kaka'ako Substation, located on Ilaniwai Street between Cooke Street and Ward Avenue; Honolulu Power Plant substation, located on the Honolulu Power Plant site along Nimitz Highway; and Iwilei Substation, located near the corner of Dillingham Boulevard and Ka'a'ahi Street. Based on discussions with HECO, the capacity of each of the substations is 70 Mw, 45 Mw, 20 Mw and 110 Mw, respectively. The current peak demand experienced at each of these substations is 25 Mw, 30 Mw, 13 Mw and 50 Mw, respectively.

The HECO primary distribution systems (11.5 kilo-volt (kV), 12.47 kV and 25 kV) within the Mauka Area currently consist of a blend of overhead and underground lines. In addition to these lines, HECO also has 46 kV and 138 kV transmission lines routed through the Mauka Area. The 46 kV transmission lines are used to energize the primary (higher voltage) side of HECO's substations; and at the substations the 46kV transmission voltage is stepped-down to 12.47 kV or 11.5 kV distribution voltages. Similarly, the 138 kV transmission lines energize the primary side of HECO's transmission substations; and, at the substations, the 138 kV transmission voltage is then stepped-down to the 46 kV transmission voltage or is used to energize the primary side of HECO's 138-25 kV substations, where the 138 kV transmission voltage is stepped-down to the 25 kV distribution voltage. Table 4-76 below provides the voltage information for each of the four HECO substations within the Mauka Area.

Pole-top and ground-mounted HECO owned transformers further step-down the distribution voltage to secondary voltages that are then useable by HECO's customers.

HECO's 138 kV transmission line within the Mauka Area has been installed completely underground and extends from HECO's Archer Substation, located just off Kapiolani Boulevard, along Kapiolani Boulevard down Kamakee Street onto Kona Street and into the Kewalo Substation. From the Kewalo Substation the underground 138 kV line

continues on Kona Street, past the Ala Moana Center, back onto Kapiolani Boulevard to HECO's Kamoku Substation located at the corner of Kamoku Street/Date Street/Kapiolani Boulevard.

Table 4-76: HECO Voltage Within the Mauka Area

HECO Substation	In-Coming Transmission Voltage	Out-Going Distribution Voltage
Kewalo Substation	138 kV and 46 kV	25 kV and 12.47 kV
Kaka'ako Substation	46 kV	11.5 kV
Honolulu Power Plant Substa.	46 kV	11.5 kV
Iwilei Substation	138 kV and 46 kV	25 kV and 12.47 kV

HECO 46 kV transmission lines within the TOD eligible areas, are installed both underground and overhead. The underground 46 kV transmission lines are located along Cooke Street, Halekauwila Street and Kona Street. The overhead 46 kV lines are located along Pensacola Street, Kona Street (west of Pensacola Street) and Waimanu Street.

Based on the estimated Future Baseline Condition build-out figures, the anticipated increased electrical demand will be 89 Mega Volt-Amperes or 89 MVA, tabulated as follows: increased residential loading of 57 MVA or 64% of total load growth; increased commercial loading, of 19 MVA or 21% of total load growth; increased retail loading of 10.5 MVA or 12% of total load growth; increased industrial loading of 1 MVA or 1% of total load growth; and increased parking structure loading of 2 MVA or 2% of total load growth. Averaging the build-out over the 21-year period (2014-2035), the average annual load growth will be approximately 4 MVA per year.

4.11.5.2 Potential Impacts and Recommended Measures to Mitigate Them

Based on the estimated TOD Alternative A build-out figures, the anticipated increased electrical demand, over and above the Future Base estimated demand, will be 30 MVA, tabulated as follows: increased residential loading of 36 MVA or 120% of total load growth; a decreased commercial loading, of -6 MVA or -20% of total load growth. Averaging the build-out over the same 21-year period, the average annual load growth with TOD Alternate A will be approximately 5.2 MVA per year.

Based on the estimated TOD Alternative B build-out figures, the anticipated increased electrical demand, over and above the Future Base estimated demand, will be 14 MVA, tabulated as follows: increased residential loading of 26 MVA or 185% of total load growth; decreased commercial loading, of -10 MVA or -72% of total load growth; and decreased industrial loading of -1.8 MVA or -13% of total load growth. Averaging the build-out over the same 21 year-period, the average annual load growth with TOD Alternate B will be approximately 4.4 MVA per year.

During the initial years of development, the spare capacity in and an expansion of the existing Kewalo Substation and the existing spare capacity at the Iwilei Substation will be adequate to serve the annualized load growth. The Honolulu Power Plant Substation and the Kaka`ako Substation appear to be at their capacity, both in terms of useable land area as well as substation transformer capacity.

Using the Future Baseline Condition projection of 4 MVA increase per year, it appears that within 12 years, HECO would apparently either need to serve the additional loads from the Iwilei and Kewalo Substations, by adding another substation transformer in both substations or need to construct and energize its proposed Cooke Street Substation site or both. Beyond 12 years of development, HECO would likely need to secure an additional substation site. The need for this site would be evaluated by HECO based on actual load growth experienced.

Using the TOD Alternative A projection of 5.2 MVA growth per year, it appears that within 9 years, HECO would apparently either need to serve the additional loads from the Iwilei and Kewalo Substations, by adding another substation transformer in both substations or need to construct and energize its proposed Cooke Street Substation site or both. Beyond 9 years of development, HECO would likely need to secure an additional substation site. Similar to the load growth under the Future Baseline Condition, the need for this site would be evaluated by HECO based on actual load growth experienced during the 21-year build-out.

As interim measures, HECO could also consider adding fan cooling to their existing transformers that would increase their capacity by 25% or HECO could shift load away from the existing substations presently serving this area onto its Makaloa and Piikoi Substations, which are the closest substations to the Mauka Area, thereby creating additional capacity within substations serving the Mauka Area.

In early 2014, the existing electric generating units at the Honolulu Power Plant, which were previously operating as on-line spinning reserve, were de-activated. In the near term, HECO's Power Plant property is not planned to be re-developed and the existing Honolulu Power Plant Substation will remain in service. It is noted that, although the existing generators are de-activated, HECO may re-start these generators at any time if required for additional reserve power.

Subsequent to the issuance of the Final Draft Mauka Area Plan (DMAP) supplemental environmental impact statement in 2009, HECO, under HDOT's Nimitz Highway and Ala Moana Boulevard Rehabilitation project, is completing the construction of a duct line that will extend 25 kV circuits from the Iwilei Substation along Ala Moana Boulevard to the Queen Street intersection. The initial facility that will be connected to this duct line is the Hawaii Sea Water Air Conditioning (HSWAC) system plant located on Keawe Street. The infrastructure supports 25kV circuits and consists of 2-4" and 4-6" conduits. Additional development in both the Mauka and Makai areas of Kaka'ako District could be fed from this line by extending 2-4" and 4-6" conduits along the perpendicular side streets off Ala Moana Boulevard. By connecting the new developments to the 25 kV system, additional

capacity would be created in the existing 12.47 kV infrastructure, which consists of 2-4" and 3 or 4-5" conduits.

In areas presently served by existing overhead facilities, consideration should be given to constructing underground duct systems and relocating the existing overhead conductors. This would have aesthetic benefits as well as continuing the streetscape improvements begun under the HCDA Improvement District projects. The proposed duct system for most areas presently served by overhead systems would consist of a minimum of 3-5" conduits and 2-4" conduits and 6' x 11' manholes. The 5" and 4" conduits would accommodate the 1000 kcmil, unfused feeders and #4/0 fused feeders of HECO's 12.47 kV distribution system. HECO would require larger developments such as the Moana Vista and Ward Entertainment Center to provide dedicated sectionalizing switchgear sites and would be connected to HECO's unfused feeder system. Smaller developments, such as the Public Storage Building and Pier 1, would be connected to HECO's fused feeder system.

It appears that, in general, the existing underground duct systems within the Mauka Area have sufficient space to accommodate the proposed load growth with the caveat that, in some areas, new infrastructure would need to be constructed to extend the 25 kV distribution system. Additionally, development in areas served by existing overhead lines may be limited until an underground duct system is installed in these areas.

4.11.6 Synthetic Natural Gas System

4.11.6.1 Affected Environment

Hawaiʻi Gas (previously known as The Gas Company) is a public utility providing gas service within the State of Hawaii. Gas lines are located within most streets in the Mauka Area, with line sizes ranging from 1- to 4-inches in diameter.

4.11.6.2 Potential Impacts and Recommended Measures to Mitigate Them

Currently, Hawaiʻi Gas has no major upgrades or line installations planned in the Mauka Area. However, Hawaiʻi Gas has indicated that they can expand or upgrade their network to accommodate any required coverage expansion or increased demand. Additional gas service needs will be accomplished through installation of: larger or new lines, service laterals and meters, or by providing on-site containerized gas. Installation of new gas lines will result in short-term construction activity within street rights-of-way. Installation of new laterals will result in short-term construction impacts to some streets and sidewalks. Best management practices for construction within streets or sidewalk areas will be employed to mitigate short-term impacts.

4.11.7 Telecommunication Utilities

4.11.7.1 Affected Environment

Hawaiian Telcom (HTCo.) presently serves the Mauka Area from its Alakea and Kaka'ako Central Offices. The Alakea Central Office is located within the HTCo. headquarters building on Alakea Street. HTCo.'s Kaka'ako Central Office is located on Kawaiahao Street near its intersection with Kamakee Street. The HTCo. distribution system within the Mauka Area currently consists of a blend of overhead and underground lines. Existing HTCo. facilities include both fiber optic cables for trunking, cable television and high-bandwidth uses and copper twisted pair cables which carry voice grade and medium bandwidth signals.

Based on the estimated Future Baseline Condition build-out figures, the anticipated increased telephone line requirements will be: residential – 19,000 lines; commercial – 3,000 lines; retail – 2,000 lines; and industrial – 330 lines. It should be noted that in lieu of deploying conventional copper twisted-pair lines for new or renovated facilities, HTCo., in many cases, is providing fiber optic service instead.

With regard to cable television, Oceanic Time Warner Cable (OTWC) presently serves the Island of Oahu from its head-end facility located in Mililani Technology Park. The OTWC trunking system consists of fiber optic cables that are connected to regional hubs at various locations throughout Oahu. From each hub, fiber optic cables are extended to nodes that service neighborhoods. From these nodes a blend of coaxial cables and fiber optic cables distributes OTWC's signal to end-users. Typically, power supplies are deployed on an "as-needed" basis to provide adequate signal strength throughout OTWC's system.

Due to the nature of Time Warner Oceanic Cable's (OTWC) system, it is not apparent that the increase in residential, commercial and industrial space estimated for the Future Baseline Condition or would necessitate expansion of their existing off-site cable infrastructure except where reinforcement would be needed to provide service enhancements and where additional nodes and power supplies may be required to maintain signal strength. OTWC will be responsible to maintain the bandwidth and transmission speed of their broadband service.

4.11.7.2 Potential Impacts and Recommended Measures to Mitigate Them

Based on the estimated TOD Alternative A build-out figures, increased telephone line requirements will be: residential – 30,000 lines; commercial – 2,000 lines; and retail – 1,800 lines. It should be noted that these anticipated telephone line requirements reflect the in-building requirements and do not, necessarily, represent the actual quantity of lines that HTCo. will be installing. Further, it should be noted that in lieu of deploying conventional copper twisted-pair lines for new or renovated facilities, HTCo., in many cases, is proving fiber optic service instead.

Based on the estimated TOD Alternative B build-out figures, increased telephone line requirements will be: residential – 27,000 lines; commercial – 1,600 lines; and retail – 1,800 lines. It should be noted that these anticipated telephone line requirements reflect the in-building requirements and do not, necessarily, represent the actual quantity of lines that HTCo. will be installing. Further, it should be noted that in lieu of deploying conventional copper twisted-pair lines for new or renovated facilities, HTCo., in many cases, is proving fiber optic service instead.

HTCo.'s existing Alakea and Kaka'ako Central Office facilities appear adequate to accommodate the projected residential, commercial and industrial developments without expansion. However, HTCo. may request easements within the Mauka Area or from building developers to allow multiplexing "pair-gain" units to be deployed. These "pair-gain" units allow HTCo. to concentrate numerous customer lines onto high bandwidth, high capacity trunk lines. For example, a typical "pair-gain" unit module would concentrate approximately 100 customer lines onto 1 HTCo. trunk line. This line concentration would, in turn, lessen the quantity of cables HTCo. is required to install in their underground duct system or onto the joint utility pole system.

Similar to the electrical system, areas presently served by existing overhead facilities, consideration should be given to constructing underground duct systems and relocating the existing overhead conductors. This would have aesthetic benefits as well as continuing the streetscape improvements begun under the HCDA Improvement District projects. The proposed duct system for most areas presently served by overhead systems would consist of a minimum of 4-4" conduits and 5' x 10.5' manholes. Provision of separate underground facilities would lessen the possible congestion of HTCo. facilities by routing Oceanic Time Warner Cable owned-cables separately from HTCo. cables. HTCo. would install a combination of fiber optic and copper cables. In most cases, HTCo would use the fiber optic lines. as trunk facilities, while the copper cables provide telephone service to the buildings located along the route of the telephone duct lines. As mentioned in the previous section, HTCo. would place dedicated "pair-gain" units to serve large developments or would request easements on the large developments so that the "pair-gain" unit(s) could provide service to the large development as well as neighboring developments.

Based on available existing plans of the Mauka Area telephone infrastructure, HTCo. appears to have sufficient conduits to extend additional service from their Alakea and Kaka'ako Central Offices to the Mauka Area. HTCo. may also accommodate development in areas served by overhead lines by adding cables onto the existing poles or through replacement of existing cables with larger capacity cables. In addition, HTCO's initiative to utilize fiber optic lines to service new development in lieu of copper cable technology would create greater capacity within the existing infrastructure.

With regard to cable television service, as additional development occurs, OTWC may determine that reinforcement of their existing cable infrastructure may be needed, both to support the increase service demand and to provide enhanced capabilities. In the Mauka Area where the various HCDA Improvement District projects constructed

undergrounded duct facilities, it appears that no provisions were made for OTWC facilities. In order to initially provide service to these areas, OTWC negotiated with HTCo. for use of space with the HTCo. duct facilities. Similarly, in areas served by overhead facilities, OTWC is not a member of the Joint Pole Committee, whose members include HECo., HTCo. the City and the State, and, therefore, cannot install cables onto existing overhead poles. However, OTWC negotiated with HTCo. to lease space on the joint poles from HTCo. Existing OTWC cable facilities would either be added or upgraded to accommodate the additional development.

Similar to the electrical and telephone systems, areas presently served by existing overhead facilities, consideration should be given to constructing underground duct systems and relocating the existing overhead conductors. This would have aesthetic benefits as well as continuing the streetscape improvements begun under the HCDA Improvement District projects. The proposed duct system for most areas presently served by overhead systems would consist of a minimum of 2-4" conduits and 3' x 5' or 2' x 6' hand holes. OTWC would install a combination of fiber optic and coaxial cables. The fiber optic lines, in most cases, would be used by OTWC as trunk facilities, while the coaxial cables provide service to the buildings located along the route of the duct lines.

After the construction of the OTWC duct line along Ala Moana Boulevard, OTWC may be able to reconfigure its system to lessen the impact on the existing telephone duct lines constructed under the HCDA Kaka'ako Improvement District Nos. 1, 2 and 3. This may require developers to provide additional infrastructure within the road right-of-way from the OTWC designated service connection point to the development.

4.12 Aesthetic Environment

4.12.1 Affected Environment

Defined as a redevelopment area in 1976, the Kaka`ako District consists of an entirely urbanized area which has undergone many transitions over the past one hundred and fifty years[52]. Since the Mauka Area rezoning in 1982, this area's low-scale, circa mid-20th century commercial and warehouse buildings are beginning to be incrementally replaced with high-rise residential buildings. By the mid 1990's, commercial offices along the Kapiolani corridor and "big box" retail near to Ala Moana Boulevard and Ward Center began to proliferate in Kaka`ako's Mauka Area.[53] In response to growing development pressure, the Mauka Area Plan (2011) was adopted to provide strategies to preserve the Mauka Area's mixed industrial character, respect its existing assets, and better provide for tools to create livable neighborhoods. These tools, including a "form-based code" (Chapter 15-217 Subchapter 2, HAR) differentiate the KKCD Mauka Area into a set of

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52 A Century of Change, Kaka`ako. HCDA, 1991. web. 25 Aug. 2013.

53 Gomes, Andrew. "Retail infiltration leaving little room for industrial space in Kakaako." Pacific Business News [Honolulu], 4 Oct. 1998, web. 25 Aug 2013; http://www.bizjournals.com/pacific/stories/1998/10/05/focus1.html?page=all

neighborhoods with unique characteristics. Under the 2011 Mauka Area Plan, urban design priorities relate to local context, development opportunity and future vision. Each of Mauka neighborhoods' characteristics are described in Chapter 2, Section 2.3.1.

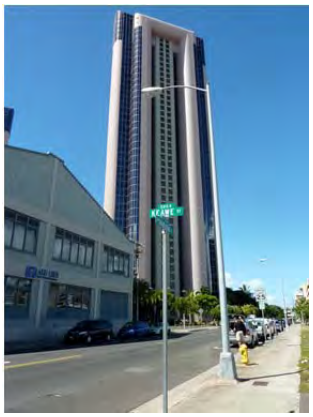
The Proposed Action project area is contained entirely within a portion of the Mauka Area, specifically portions of the Thomas Square District, Auahi, Kapiolani, Pauahi, and the Central Kaka`ako neighborhoods, which together comprises an eclectic mix of buildings with varied types, scales and relationships to the street. As part of HCDA's Mauka Area rezoning process and development and adoption of the Form Based Code in 2011, the agency completed an extensive survey documenting the built form context and representative building types for each neighborhood.[54] Following are descriptions of the key building types found within the project area.

High-Rise Residential Buildings: High-rise residential buildings scattered through the Mauka Area are generally between 100'- 400' in height. A majority of high-rise residential buildings extant in 2013 were entitled under the Mauka Area Rules adopted previously, in 2005 or 1982. The older structures can consist of a higher ratio of wall to window, be up to 200' long and 400' high with a parking podium of 1-6 stories. Many are residential "slab" buildings, a form that maximizes the number of residential units with views to the shoreline. They can have minimal modulations and tend to be a "tower in the park" extending straight up from the ground plane. An extended "super block" of high-rise towers is located at the corner of Pi`ikoi Street and Ala Moana Blvd. These buildings were entitled under the 2005 Mauka Area Rules.

Both Howard Hughes Corporation for the Ward Neighborhood Master Plan and Kamehameha Schools have recently submitted plans for the modified tower-podium form, designed to better provide for street level continuity, eyes on the street, and design quality for high rise buildings (see Photo Plate 4-1).

[54] "Synoptic Survey" Prepared as part of the Mauka Area Rules and Form Based Code, HCDA 4- Apr. 2010.

Photo Plate 4-1: Character of High-Rise Buildings in Kaka`ako



Warehouse/Light Industrial: One to three-story commercial buildings dominate the Pauahi and Auahi neighborhoods as well as Central Kaka`ako. With low overhead costs, these simple structures house local service businesses such as repair shops, automobile service, and personal services, as well as warehouses and industrial shops. Some of these buildings directly front the street (often without a sidewalk) with a clear entry and high street activation with garage or roll up doors. Others are simple steel siding, with entrances away from the street at an abutting parking lot. Some of older warehouses have been adapted to new uses, such as a warehouse that is reused as an auto dealership.[55] (See Photo Plate 4-2.)

Photo Plate 4-2: Character of Low-Rise Buildings in Kaka`ako

Thomas Square/Blaisdell Center: The Neal S. Blaisdell Center (originally named the Honolulu International Center or "HIC") has been in operation since 1964. It is a city owned and city-operated center used for conventions and concerts, with a multi-purpose arena and neighboring performing arts center (the Concert Hall). The facility includes an associated multi-level parking garage (2,000 stalls). Situated on the makai side of King Street, across the street from historic Thomas Square, the center is located in the KCDD's Thomas Square District neighborhood that also includes the McKinley High School campus. (See Photo Plate 4-3 below.)

Photo Plate 4-3: Neal S. Blaisdell Arena

55 Kamehameha Schools, owner of nine contiguous blocks in the community references this type of street environment in plans for the recently released catalyst SALT project (bordered by Ala Moana Blvd., Coral, Keawe and Auahi Streets) which proposes a conversion of an industrial complex into a mix of retail and residential tenancies.

Commercial and Retail Uses Ward Center: TJ Maxx, Sports Authority, and other single use retail buildings are located along Auahi Street and Ward Avenue near to Ala Moana Boulevard with either surface parking lots, or associated multi-story garages. Ward Village shops, now under construction will house major national chain retail. The Kapiolani corridor also contains mid-rise office buildings from 4-12 stories. These buildings have separate parking garages. (See Photo Plate 4-4 below.)

Photo Plate 4-4: Commercial Buildings on Ward & Kapiolani

Parking Lots and Temporary Uses: Portions of the Pauahi and Auahi areas are presently occupied by surface parking areas. In these locations, programmed festivals such as "Eat the Street" festival (555 South), the Honolulu Night Market, and most recently the American Circus, bring temporary activation onto parking areas. Additionally, temporary themed "pop-up shops" have begun to appear in the district that

take advantage of the lower rents and high accessibility of the District. (See Photo Plate 4-5 below.)

Photo Plate 4-5: Temporary Use of Parking Lot in Kaka`ako

Open Space and Public Realm: As discussed above in Section 4.10.9.1, there are presently seven public parks in the entire KCDD. Although some of the following information repeats what was previously presented, it focuses on urban design and aesthetics.

The Mauka Area contains two public parks.

- Mother Waldron Park Neighborhood Park is registered on both the Hawaii register of Historic Places (HRHP) and the National Register of Historic Places (NRHP) because of its distinct art deco features. While central to the project area, the park lacks updated amenity spaces, and is underutilized. The rapid transit alignment will abut the park's boundary on Halekauwila Street. Several adjacent parcels are already developed as high-rise towers, i.e. the Waterfront Towers, and Pohulani residential tower. The Halekauwila Place project, a 19 story tower, 204 unit affordable housing project, has been completed on the property directly abutting the 'Ewa – mauka corner of the park.
- Kolowalu Park is a two-acre passive park on either side of Queen Street between Waimanu Street and Kamakee Streets.

There are also two public parks, located at the corner of Cooke Streets and Kawaiahao Street and along Ala Moana Boulevard as part of the waterfront plaza project. In total, since 1982, the HCDA has introduced 16 acres of privately dedicated recreation area into the KKCD, consisting of landscaped setbacks, and small, dedicated park areas. HCDA is also working with McKinley High School to make the school's planned new track and field

facility available for public use during evenings and weekends. The Mauka Area is also directly across South King Street from the Thomas Square Historic Park.

The Makai Area contains the Kaka`ako Waterfront Park, and the Makai Gateway Park, Kewalo Basin Park and is directly adjacent to Ala Moana Beach Regional Park. Outside of traditional parks, the quality of the existing public realm is diverse, and transitioning. While Kapiolani Boulevard and Punchbowl Streets are notable green corridors with mature street trees, large portions of the project area's local streets lack pedestrian facilities, particularly in Pauahi, Auahi and Central Kaka`ako neighborhoods. These local streets do not have street trees, landscape strips or buffers, and in the case of portions of Queen Street, sidewalks, curbs and gutters. Ala Moana Boulevard, as an important regional route has a landscaped property line setback, but lacks either on-street parking or landscape strips to buffer pedestrians from street traffic. It also generally does not have ground-level walk-in uses that contribute to a comfortable pedestrian environment and can be accessed directly from the Boulevard. Electric power lines are under ground on most major streets in the district.

Planned public park facilities are associated with Kamehameha Schools Master Plan and Ward Neighborhood Master Plan. Each master plan has a 3% public facilities dedication requirement for new commercial uses and 4% public facilities dedication residential uses. Additionally 10% of the total land area covered by each master plan is required to be provided as open space. Both master plans are moving forward with their Phase One implementation. The KS Master Plan consists of an estimated total of 126,000 SF for new open space. Proposed enhancements include:

- Implementation of green street design between Makai Gateway Park and Mother Waldron Neighborhood Park on Cooke Street. This linear park is also coordinated in the Mauka Area Plan.
- A community gathering place at the intersection of Cooke and Auahi Streets with indoor/outdoor space and a large public plaza, now in design stages.
- Kamehameha Schools addresses the potential for associated improvements to Makai Gateway Park and Mother Waldron Neighborhood Park.
- The potential for associated improvements to Makai Gateway Park and Mother Waldron Neighborhood Park.
- Activated green open space on the podium levels constitutes embedded open spaces available to tenants and building users.

In the Ward Neighborhood Master Plan, open space is currently estimated at 260,000 SF. In addition, nearly 250,000 SF of recreational space will be provided for neighborhood use. The Ward Center Master Plan proposes a major linear greenway or Central Plaza as the community's "outdoor living room." The 3.25-acre Central Plaza extends across the length of Ward Center to Ala Moana Boulevard. Additional active spaces are designated at `Ewa Plaza and Diamond Head Plaza.

4.12.2 Visual Resources and Context

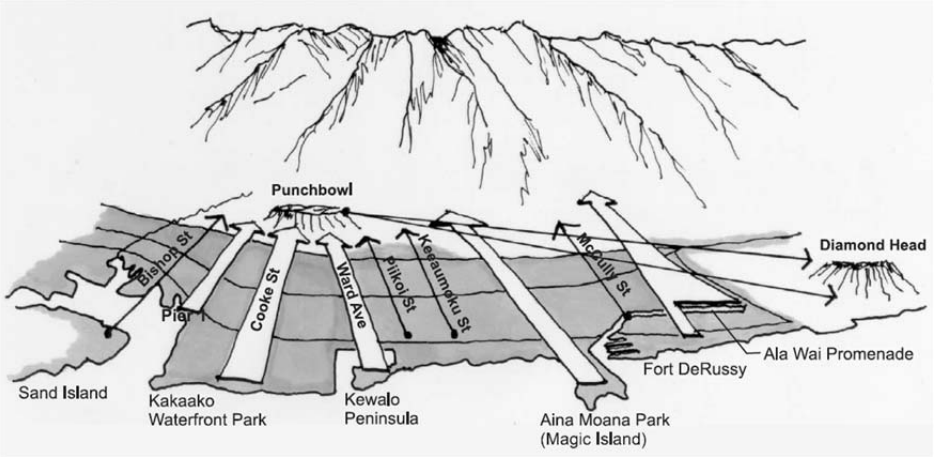
The City's Primary Urban Center Development Plan identifies significant broad, public vistas in the Kaka`ako area (PUC DP, page 3-3). See Figure 4-35. According to the Plan, these vistas have been selected not only to promote local way finding, but also contribute to the overall "sense of place" for urban Honolulu. Panoramic views identified in the PUC DP within the Kaka`ako District are:

- Views of the Ko`olau and Waianae Mountain Ranges and their foothills
- Views to the Pacific Ocean and Kewalo Basin
- Views of the Puowaina (Punchbowl) crater

While the PUC DP identifies these vistas as desirable, it also notes that "there are public places along the shoreline – such as Ala Moana Beach Park, Kaka`ako Waterfront Park and Kewalo Basin" where these panoramic mauka views are gradually diminishing as high-rise buildings are developed.[56]

The Mauka Area Rules established and the Proposed Action also maintains a set of mauka-makai view corridors. See Figure 4-36. These corridors align with the width of the street, combined with building setbacks (and/or building placement guidelines). Street end views to the Ko`olau range are available from the public right of way, except in those instances where a street includes a turning point.

Figure 4-35: View Corridors Identified in the Primary Urban Center Development Plan

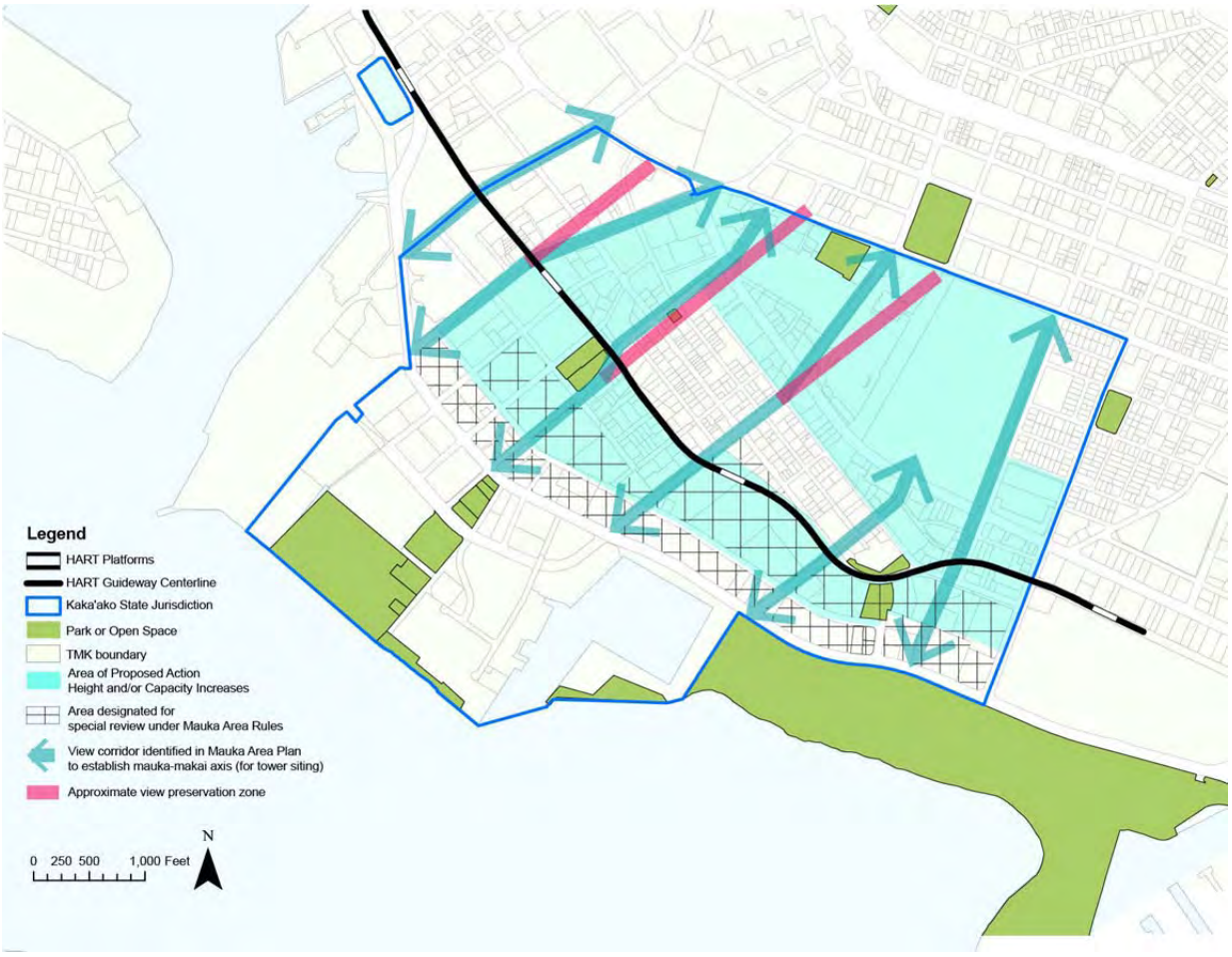


To further this policy of view protection, The Mauka Area Plan designates a corridor fronting Ala Moana Boulevard as the Ala Moana Special Review District in response to the public desire to have a higher quality design treatment along Ala Moana Boulevard and to ensure views to the Ko`olau range would be preserved and avoid a monolithic "wall of

56 City and County of Honolulu, Primary Urban Center Development Plan, Department of Planning and Permitting, 2004 p3-3

towers." The Ala Moana Special Review District constitutes much of the area currently in the Kamehameha Schools and Ward Neighborhood Master Plan and relies upon a discretionary review process by HCDA for the number and placement of towers, with maximum heights of 400'. Project Review criteria include: visual access to the ocean, encouraging and preserving pedestrian access to the Makai Area, and creating nodes of activities at street corners.

Figure 4-36: Established Mauka-Makai View Corridors in Kaka`ako



Existing conditions for the PUC DP associated vantage points are described as follows:

**Vantage Point 1: Kaka'ako Waterfront Park to Ko`olau Ridgeline:** The Kaka'ako Waterfront Park is located in the Makai neighborhood. A view corridor extends from this park over Kaka'ako Makai Gateway Park, allowing for mauka views with partial views to the Ko`olau Mountain range and Punchbowl (Photo Plate 4-6). The current placement of high-rise towers in the distance allows for a good sense of the scale and proximity of the mountain range. Those areas of the Kaka'ako Waterfront Park makai of the (4 story) John A. Burns School of Medicine have obstructed views.

Allowable building heights of 200 feet within the Makai neighborhood – particularly on development parcels adjacent to Ala Moana Boulevard will further obscure views into the distance except in those areas where development is not allowed, i.e. identified park and open space areas, and the historic pump station, and street right of ways.

Photo Plate 4-6: View from Waterfront Park Looking Mauka

Vantage Point 2: Kewalo Basin looking Mauka: The Kewalo Basin is an area identified for water-related uses, with low-rise structures for water-related commercial enterprise at its hardened shoreline. Kewalo Basin also includes a public promenade that affords panoramic views of the Makai neighborhood and the Auahi and Pauahi Districts, as well as through the Ala Moana Special Review District (Photo Plate 4-7).

Photo Plate 4-7: View from Kewalo Basin Looking Mauka

Vantage Point 3: Ala Moana Beach Park Kamakee Street: Makai of Ala Moana Boulevard, the Ala Moana Beach park offers recreational opportunities and shoreline access. Vantage points within the park afford views mauka in the Auahi District, and the Ward Center Master Plan area. Single story buildings and trees within the park obscure panoramic views to the Ko`olau ridgeline (Photo Plate 4-8). Consequently, views to the Ko`olau range are best observed at existing street corridors such as Kamakee Street, but skyline views of high rise buildings, and some narrower views may be accessed from through-out the park.

Photo Plate 4-8: View from Ala Moana Beach Park Looking Mauka to Kamakee Street

In addition to the views identified in the PUC DP, the following five vantage points have been identified for the purposes of this EIS, and consist of views from selected public sites in the project location: McKinley High School, Thomas Square, Punchbowl, from Makai Coral Street and Ilalo Street looking towards Mother Waldron Park, and from the entrance to the National Memorial Cemetery looking makai.

Vantage Point 4: McKinley High School Makai: McKinley High School constitutes a publicly owned shared open area within the District. Views `*Ewa*, diamond head, mauka and makai give a sense of the changes occurring in the distance, particularly in a cluster of new towers along Kapiolani, at the Honolulu Design Center, and along South Street. The existing view from the playing field at McKinley High School looking makai shows lower rise public storage building on Kapiolani, and towers in the distance in the high rise

super block bounded by Queen, Waimanu and Piikoi Streets, and Ala Moana Boulevard. (see Photo Plate 4-9)

Vantage Point 5: McKinley High School 'Ewa: The view `*Ewa* from McKinley takes in high-rise construction along Kapiolani Boulevard, as well as the parking garage associated with the Blaisdell Center. (see Photo Plate 4-10)

Vantage Point 6: Thomas Square, Makai: Located makai of the trees surrounding the fountain, Thomas Square has a view into the Kaka`ako District at the Neil S. Blaisdell performing arts center. Any changes proposed there would be visible from Thomas Square. (see Photo Plate 4-11)

Photo Plate 4-9: View from McKinley High School Sports Field Looking Makai

Photo Plate 4-10: View from McKinley High School Sports Field Looking Ewa

Photo Plate 4-11: View from Thomas Square Looking Makai

Vantage Point 7: Coral Street and Ilalo Street, Mauka: There is no required view corridor on Coral Street. Rather, Coral Street ends at the makai end of Mother Waldron Neighborhood Park, begins again on the mauka side of the park and extends mauka to Queen Street where it terminates. It angles to the Diamond Head direction just mauka of Mother Waldron Neighborhood Park, effectively terminating the view corridor up the street from Ala Moana Boulevard. This vantage point is chosen to showcase the redevelopment around the Civic Center Station and adjacent to Mother Waldron Neighborhood Park. Currently much of Coral Street corridor mauka of Ala Moana Boulevard is low scale, with single story buildings. (see Photo Plate 4-12)

Photo Plate 4-12: View from Coral Street at Llalo Street Looking Mauka

Vantage Point 8: Punchbowl at the Entrance to the National Memorial Cemetery: This vantage point is located at the entrance to the National Memorial Cemetery at Puowaina Drive. Urbanized Kaka`ako can be seen in the distance. However, it should be noted that pedestrians do not frequent this vantage point because there is no public parking adjacent to it, and pedestrian activity is oriented to the cemetery. (see Photo Plate 4-13)

Photo Plate 4-13: View from Punchbowl Looking Makai

4.12.3 Honolulu International Airport Safety Concerns

A majority of the Mauka Area is located in the Precision Instrument Approach Zone between a 15,000 and 20,000-foot radius of the Honolulu International Airport runway. (Attached as Appendix H is the 19-12-14 Department of Transportation, Airports Division, Federal Airports Administration Airport Zoning Map.) This is an area where the Federal Aviation Administration (FAA) uses precision equipment to monitor approaches, and its air traffic controllers issue guidance instructions to pilots based on the aircraft's position in relation to the approach course. Under FAA rule 77.9, projects within the Mauka must submit FAA Form 7460-1 Notice of Proposed Construction or Alteration if the project exceeds an imaginary surface extending outward and upward at the following defined slope:

- Taller than 200'.
- 100:1 for a horizontal distance of 20,000 ft from the nearest point of the Honolulu International Airport runway.

These requirements are intended to ensure that the FAA is kept informed of new development and is provided an opportunity to comment on its potential impact upon airport flight operations.

4.12.4 Shadows, Light and Glare

Current lighting conditions within the KCDD are typical of an urban environment. When viewed from surrounding areas, Kaka`ako is similar to other urbanized locations, particularly Ala Moana, Waikiki and Downtown Honolulu. At night, existing buildings in the District and vehicles traveling on roads within the District currently generate limited ambient light. During the day, glare is created by some building surfaces (windows and building materials) reflecting sunlight. In the area surrounding the District, the primary sources of ambient nighttime light and daytime glare are buildings (including glare from windows and building materials), and at night by automobiles on area roadways. Because of the high concentration of buildings and automobile traffic in both the Central Business District (downtown) and Waikiki and the major roadways leading to them, these areas outside the District currently contribute a proportionally larger amount of daytime glare and nighttime ambient light in the general urban area than the District itself.

4.12.5 Potential Impacts

This section describes changes to the aesthetic character of the built environment that could occur under the Proposed Action and the Future Baseline Condition. As the Proposed Action assumes an increase in both capacity (building density) and height, it would result in a greater potential for visual impacts. However, due to the fact that the specific lay-out of uses, including building heights and scale, cannot be specifically defined at this point in time because they are ultimately dependent upon specific development plans for individual properties that are not yet known, this EIS employs a "worst-case" analysis regarding the potential level of redevelopment, location of buildings and building heights that could occur during the build-out period (see Appendix I for the methodology used in this analysis). Actual uses, building footprints, designs, heights etc. will ultimately be determined by future market conditions and the specific agreements and applicable development regulations and standards that govern long term site redevelopment. Changes to the project are also assumed to be incremental over the approximately 20-year build-out period.

4.12.5.1 Urban Design

Future Baseline Condition: Under the Future Baseline Condition, new mixed-use developments assumed for the KCDD would be consistent with the current Mauka Area Plan, development agreements and rules. Development would occur on a project-by-project basis. Current developments may achieve building heights up to 400 feet, as specified by the Mauka Area Rules in identified neighborhood areas. The existing process for design review and building permitting would continue. Some neighborhoods could

have a discontinuous visual appearance where redevelopment occurs on a lot-by-lot basis. Visual contrasts between older and newer buildings could increase and there is a potential for incompatibility, and/or abrupt transitions between older and new buildings. This is particularly true where properties are privately owned, and development proposals (or decisions not to develop) will largely remain with many individual parties.

However, this is a condition that is common to any metropolitan area that undergoes redevelopment.

Proposed Action: Both TOD Alternative A and TOD Alternative B propose to switch to a different way to quantify and regulate development capacity. Both rely on a minimum lot size of 40,000 sq. ft. to take advantage of the incentive based development rules for TOD.

Floor Area Ratio

FAR capacity begins at 5.0 FAR (but is inclusive of areas devoted to parking). While causing complexity in analysis, the inclusion of parking requires developers to consider their choice of building parking as a land use. Development incentive is assumed beyond the 5.0 FAR such that amenities are allocated upon provision of those features that improve associated infrastructure.

Overall FAR capacity is held relatively constant between the two alternatives, bulk and scale change when associated with height allowances. FAR is used as one tool, in coordination with Floor plates, tower spacing and form-based standards in the Regulating Plan to be prepared by HCDA.

At full build-out, TOD Alternative A would change the character of the overall Mauka Area, and sites entitled under the Plan would develop to a greater intensity and scale. Transit integration resulting from the transit-oriented development would likely result in more intensity of use, including street-level uses located near to the Civic Center Station, Kaka`ako Station and Downtown Honolulu Station. TOD Alternative A demonstrates the potential for a greater frequency of towers, including some buildings that are taller than those in Downtown Honolulu or previously constructed in the District.[57]

When applying proposed building types and maximizing all density allowances, an eligible parcel could result in up to two towers per development site (provided it meets lot size thresholds). For example, Neighborhoods presenting a FAR maximum of 8.5 would likely allow for one taller structure (>400') to be paired with a lower structure (240'), and podium structure, or some variation thereof. Those areas with a greater development capacity (10 FAR) could effectively increase building heights on the high-rise structure to accommodate greater capacities, adding additional units. While maximum building heights would vary throughout the district; TOD Alternative A anticipates only one tall 700' tower in each of the Pauahi, Auahi and Thomas Square neighborhoods (see Figure 4-37). Buildings in each of the Alternatives have maximum height limitation directly restricting both floorplate size and heights. These attributes are maintained and refine in parallel with density increases.

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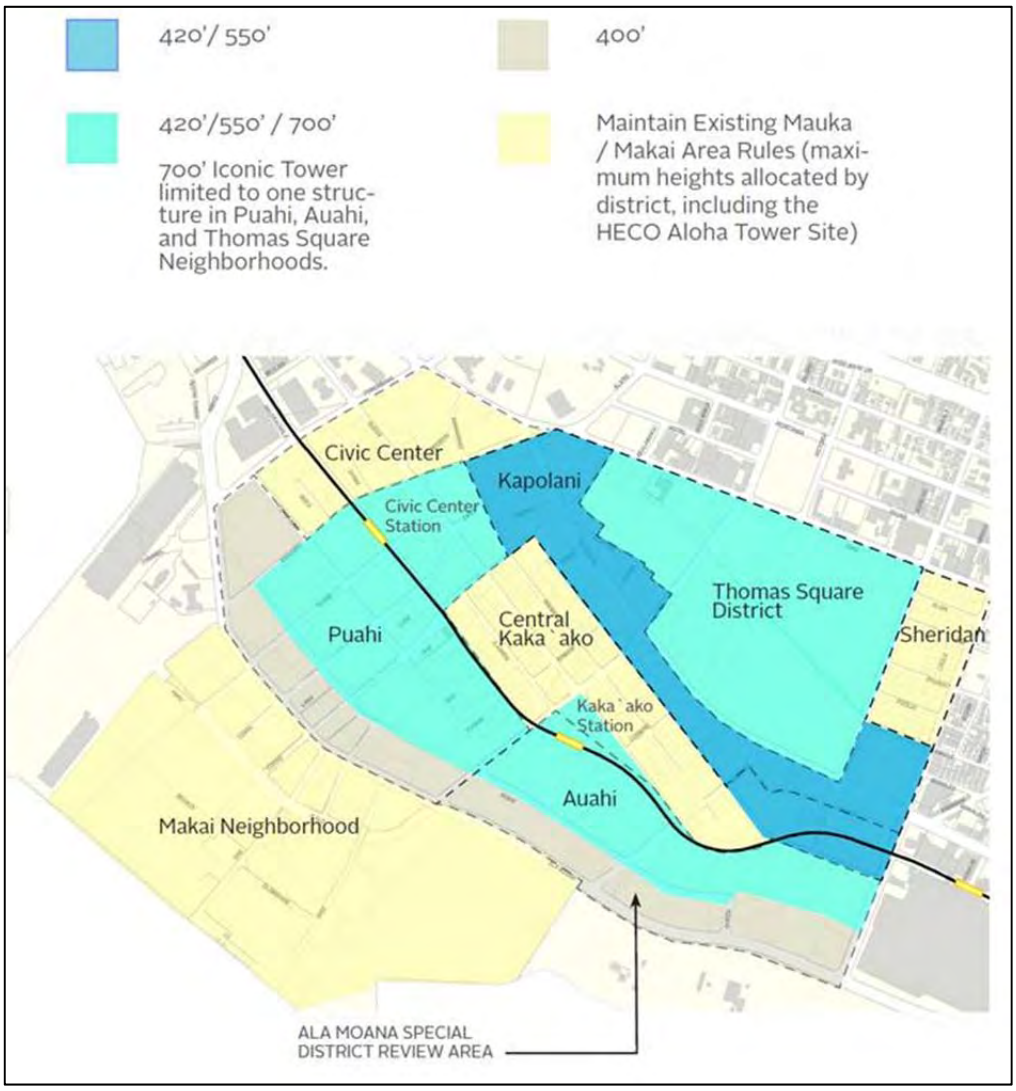
[57] The current tallest building on O`ahu is the First Hawaiian Bank, at a height of 438 feet. Buildings in adjacent Waikiki are allowed up to 350 feet. By comparison, the summit of Diamond Head is 761 feet. Mountain peaks comprising the Ko'olau mountain range average about 2,500 feet.

TOD Alternative B would have a similar aesthetic impact to the District as TOD Alternative A, only the building heights would be restricted to a maximum height of 418 feet.

Figure 4-37: Height Limits Recommended in TOD Alternative A



Street Elements

The term "Street Element" is defined in the Mauka Area Rules as the element that creates a consistent street wall and that area of a building that defines the public space at ground level. In a High-Rise building, the "Street Element" is the lower portion of the building fronting the street, as opposed to the tower element – which is setback, and constrained by maximum footprint controls. The scale and size of a Street Element is generally determined by the necessity to accommodate all required off-street parking for that

development within the development lot. As a result, the amount, treatment and design of parking ultimately influence a building's street characteristics and the quality of pedestrian experience due to access or design treatments.

In a High-Rise building, the range of height allowable under the Future Baseline Condition for a Street Element (before a required setback) is a minimum height of 4 stories or 40' and a maximum height of 15' - 65' (depending on location and context). In the two adopted Master Plans (KS and Ward), the Street Element may achieve a maximum of 75' heights. Under the Proposed Action, while overall height of the towers may increase, the general characteristics of the "Street-Element" and the pedestrian experience at street level would maintain a similar scale as the Future Baseline Condition.

Under the Proposed Action (both Alternatives A and B), a Street Element height of 75' in most locations would accommodate usable area to be placed in the podium and at the street-level such as retail, restaurants, offices or residential units (instead of exposed parking garages). This 75-foot Street Element height limit also allows for garages to be fully buffered from view for aesthetic purposes. Additionally, the Proposed Action encourages residential projects to use the top level of a parking podium as an activated green space with an option to include townhouses that open directly onto these areas.

Parking

Under the Proposed Action (both Alternatives A and B), the portion of a new building allocated to parking (i.e. much of the internal, lower stories located behind the Street Element facade) may ultimately be reduced relative to overall building height and capacity as compared to the Future Baseline Condition. This is due to an emphasis on programs leading to the efficient management of parking as a common resource. Both Alternatives include strategies (commonly known as "transportation demand management) that jointly help to reduce the necessity for a private developer to supply individual, reserved parking spaces specific to each use at the levels currently sustained today. Furthermore, one of the most important shifts assumed under the Proposed Action that will affect the demand for auto use is access to high capacity transit. Strategies considered that affect the design of parking in TOD sites include:

- Counting of square feet associated with the parking in overall density limitations;
- More efficient use of reserved parking spaces with the broad application of Transportation Demand Management strategies and the on-going transition to more shared and joint use parking scenarios;
- Concurrent investment in new and/or improved public infrastructure and associated identified street enhancements that may encourage residents to utilize public transit, walk, or cycle such as bicycle lanes, and access to bike share, new internal streets, or traffic calming;
- Improved access to local transit service, and high capacity transit stations, and
- Potentially unbundling the selling of individual parking spaces from the unit price.

Older buildings and those buildings that no longer produce positive net value compared to rising land values, or shifting economic needs may eventually be demolished or remodeled by landowners in favor of newer structures that meet the HCDA's current design standards. Additionally, land consolidation may occur associated with this redevelopment process.

4.12.5.2 Visual Resources and Views

Impacts Common to Either Alternative: As projects in the Mauka Area develop according to existing zoning, views of, and within the KCDD are expected to change significantly. The greatest impacts will be seen with the higher intensity growth in number and frequency of high-rise buildings under the TOD Alternative A. TOD Alternative B would result in impacts greater than the Future Baseline Condition, but less than the TOD Alternative A. Under either Alternative, panoramic views from identified viewpoints, and existing high-rise or low-rise buildings will be curtailed, but existing view corridors along major mauka-makai streets will be preserved. Buildings fronting Ala Moana Boulevard and situated in the Makai Area will have reduced views of the Ko`olau Range, while buildings along Kapiolani and in the Thomas Square Neighborhood will have reduced views of the ocean. This is typical of an urban environment where external views of landscapes are slowly exchanged for framed views and new architectural features.

Although some existing residents of the District actively oppose any new development that might impact their views, it is possible that the new development occurring in the Kaka`ako District could also be an attractive addition to the views and visual character of the existing community, helping to create new community identity or enhancing the existing sense of place. With all due respect to the passion of those opposed to new development because of reduced views from the balconies of their individual units, the Proposed Action must balance the desires of the few with the needs of the many. The long envisioned redevelopment of Kaka`ako to address the provision of affordable housing and the reduction of development pressures on O`ahu's rural areas, clearly outweighs the complaints of those who purchased high-rise units in a district slated for redevelopment. As demonstrated above, the Proposed Action is consistent with the preservation of view corridors required by the City's Primary Urban Development Plan. Beyond that, it is a matter of urban design. How best can the new development be constructed to create a new and attractive cityscape and skyline for Kaka`ako?

Towers under both the Mauka Area Rules and the two Alternatives must orient towards the closest designated mauka-makai corridor, and include tower separations of a minimum of 80' (for portions of the building above 100') as well as meet other existing and identified view preservation policies. Due to the distance between the Kaka`ako Mauka Area and the identified vistas, and its minimal topography, external views from the ground plane to the Ko`olau Range, Puowaina (Punchbowl Crater) or the shoreline would be obstructed by even low-rise existing development. Additionally, while Makai Area Rules allow for 200' buildings to line the Makai side of Ala Moana, there are currently few restrictions on floor plates, massing or bulk which may result in view obstruction to the Ko`olau ridgeline from the Kaka`ako Waterfront Park.

View Comparisons: As part of the visual analysis for this EIS, eight viewpoint locations were selected as representative views (see Photo Plates 4-6 to 4-13). Based on these viewpoints, visual simulations of site redevelopment under each EIS Alternative were prepared based on massing concepts that assume a level of redevelopment and building heights consistent with the Alternatives. The conceptual buildings representing the extent of potential building massing visible from the respective viewpoint are consistent with the assumed total building square footage and the assumed maximum heights for the Alternatives.

In this analysis, new construction under TOD Alternative A is depicted in blue, while new development under TOD Alternative B is depicted in purple. Under TOD Alternative B, the analysis assumes that existing buildings less than 418 feet in height will eventually be replaced by buildings constructed to the maximum allowable height.

Vantage Point 1: Kaka`ako Waterfront Park

The panoramic view to the Ko`olau Ridge from the Waterfront Park (Photo Plate 4-14) would be obstructed by the continued development of high-rise towers in the Mauka Area, as well as allowable office and commercial development in Makai under existing rules (Future Baseline Condition).

Photo Plate 4-14: Visual Impact of Future Baseline Condition from Waterfront Park

Under the TOD Alternatives, the Ala Moana Special District review area is maintained with no height changes proposed one block mauka of Ala Moana. However, for those

eligible areas in Pauahi and Auahi, height limits are raised to a base of 420'. This increased height limit, together with potential taller structures at 550' and possibly 700' will shift the skyline to create a hierarchy of scale (see Photo Plates 4-15 and 4-16). These additional buildings may increase in height to just below the Ko`olau ridgeline when viewed from the Makai Area. The combination of future potential developments in Makai as well as Mauka will result in reduced visibility except in mandated view corridors. In this instance the view corridor above the Makai Gateway Park, and extending out to Cooke Street may provide the best opportunity to preserve uninterrupted views of the Ko`olau ridgeline. Please note that in this analysis, TOD Alternative A assumes that the property at 690 Pohukaina Street will be built out with either one or two towers (Photo Plates 4-15 and 4-16 respectively).

The view impacts of the TOD-B Alternative are generally similar to those associated with the TOD-A Alternative (see Photo Plate 4-17). Impacts to mountain views are generally comparable, however, from this particular viewpoint, portions of the mountain view over the Ward area are lost. Because the maximum tower height is 418 feet for the TOD-B Alternative, the analysis assumes that most towers are built to that height, creating a more monolithic skyline with less hierarchy of scale, compared to the TOD-A Alternative. An increase in overall development capacity increases the frequency of towers, but the existing view corridors are marginally maintained.

Photo Plate 4-15: Visual Impact of TOD Alternative A from Waterfront Park (with one tower at 690 Pohukaina Street)

Photo Plate 4-16: Visual Impact of TOD Alternative A from Waterfront Park (with two towers at 690 Pohukaina Street)

Photo Plate 4-17: Visual Impact of TOD Alternative B from Waterfront Park (with two towers at 690 Pohukaina Street)

Vantage Point 2: Kewalo Basin looking Mauka

Under both the Future Baseline Condition and the two Alternatives, it is likely that continued construction within the Mauka Area will obstruct views to the Ko`olau Range from the Kewalo Basin public promenade. The Ala Moana Special Review District maintains height and capacity limitations on buildings to 400' one block mauka of Ala Moana Boulevard in both alternatives. Photo Plate 4-18 depicts the anticipated visual impact of the Future Baseline Condition.

Under TOD Alternative A, taller and more frequent towers will place more importance on the street level views at Ward Ave, from the proposed Ward Center plaza open space, and from Kamakee Streets. In these locations views may be obtained up past Kapiolani Boulevard towards the relative open space of McKinley High School grounds. These street corridors will become important wayfinding locations for orientation towards or away from the Ko`olau Range at ground level. (see Photo Plates 4-19 and 4-20)

Photo Plate 4-18: Visual Impact of Future Baseline Condition from Kewalo Basin

Photo Plate 4-19: Visual Impact of TOD Alternative A from Kewalo Basin (with one tower at 690 Pohukaina Street)

Photo Plate 4-20: Visual Impact of TOD Alternative A from Kewalo Basin (with two towers at 690 Pohukaina Street)

The impacts of the TOD Alternative B are generally similar to those associated with the TOD Alternative A. But TOD Alternative B uses lower scaled buildings to achieve capacity increases. This Alternative results in more obscured views to the mountains, compared to the No Action Alternative.

Photo Plate 4-21: Visual Impact of TOD Alternative B from Kewalo Basin (with one tower at 690 Pohukaina Street)

Because the maximum tower height is 400 feet for the TOD Alternative B, most towers are built to that height, creating a more monolithic skyline with less hierarchy of scale, compared to the TOD Alternative A.

<u>Vantage Point 3: Ala Moana Beach Park looking Mauka at Kamakee Street</u>

The mauka-makai view corridor maintains distance views from this public intersection under both the Future Baseline Condition (Photo Plate 22) and the Proposed Action (Photo Plates 4-23 and 4-24).

This viewpoint also illustrates the general quality of street level views at Ala Moana Boulevard. In both Alternatives, the Kamakee mauka-makai view corridor requires towers to be stepped back a minimum of 50' from the Street Element. In this location, Ward Master Plan allows for a maximum of 75' Street Elements. In all Alternatives, building siting and placement is determined by "Build-to lines" designated in the Mauka Area Plan, (figure NZ.1-7 of that plan) which designates the distance between the lot line and the building edge. On Ward Avenue there is a 15' distance from the lot line. While not shown, it should be assumed that generous landscaping and sidewalk treatments would improve the Ward Ave street context.

Photo Plate 4-22: Visual Impact of Future Baseline Condition from Ala Moana Beach Park at Kamakee Street

Photo Plate 4-23: Visual Impact of TOD Alternative A from Ala Moana Beach Park at Kamakee Street

Photo Plate 4-24: Visual Impact of TOD Alternative B from Ala Moana Beach Park at Kamakee Street

The impacts of the TOD Alternative B are nearly identical to those associated with TOD Alternative A. Views to the mountains would be identical for both Alternatives. TOD Alternative B would have slightly less impact on views to the sky because the tower on the west side of Kamakee would be limited in height to 418 feet, as opposed to the 550 feet envisioned in the TOD Alternative A.

Vantage Point 4: McKinley High School Looking Makai

This viewpoint shows the condition of development along the Kapiolani Boulevard. The photograph has been taken approximately at the 50-yard line at the McKinley High School football field.

The Future Baseline Condition (Photo Plate 4-25) illustrates the potential for commercial/residential towers of up to 400' to be constructed on consolidated land parcels along Kapiolani Boulevard.

Photo Plate 4-25: Visual Impact of Future Baseline Condition at McKinley High Sports Field School Looking Makai

TOD Alternative A increases the number and frequency of these towers (see Photo Plate 4-26). Height limitations for buildings are raised to 420' and in limited circumstances, up to 550'. In the Illustrated view point, additional high rise buildings can be seen adjacent to the rapid transit alignment, as well as beyond in the Auahi District as part of the Ward Centers master planned area.

The impacts of the TOD Alternative B are nearly identical to those associated with the TOD Alternative A (see Photo Plate 4-27). TOD Alternative B would have slightly less impacts on views of the sky because of the height limitation to 418 feet for towers on Kamakee Ave.

Photo Plate 4-26: Visual Impact of TOD Alternative A at McKinley High School Sports Field Looking Makai

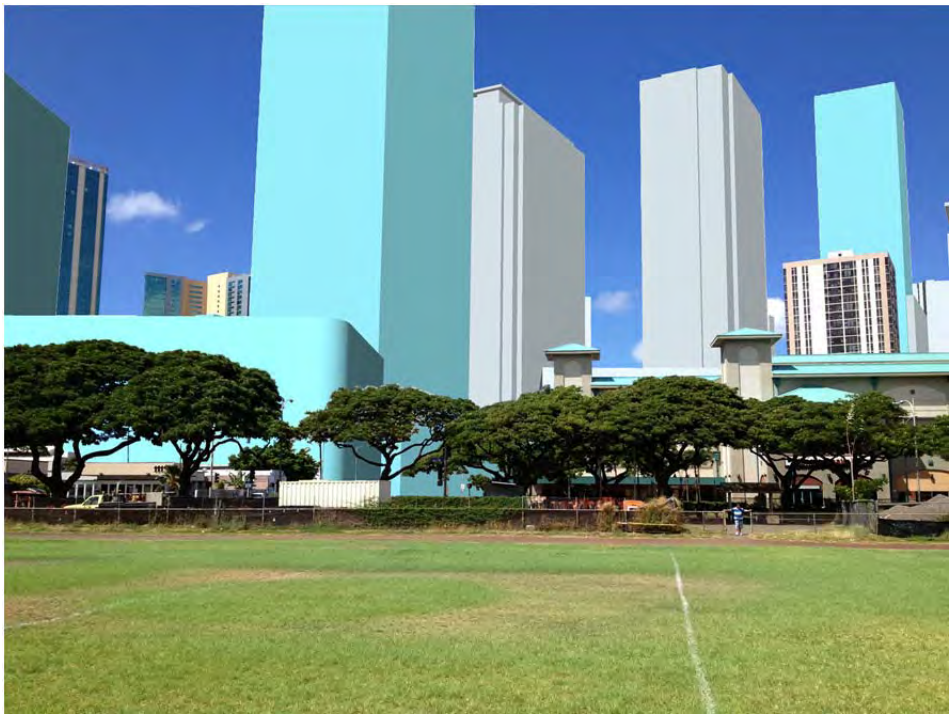


Photo Plate 4-27: Visual Impact of TOD Alternative B at McKinley High School Sports Field Looking Makai

Vantage Point 5: McKinley High School Looking Ewa (Blaisdell Center Site)

The Future Baseline Condition illustrates a possible redevelopment scenario for the Blaisdell Site with a series of high-rise structures (see Photo Plate 4-28). The total number of structures shown on the site meets existing capacity limitations of 3.5 FAR. There would be other potential scenarios for Blaisdell redevelopments, including maintaining existing structures. This illustration reflects a portion of nearby 400' high-rise, with its Street Element located on S. King Street. The Symphony Project now permitted on the corner of Ward and Kapiolani would also affect views from the McKinley High School looking `Ewa.

Photo Plate 4-28: Visual Impact of Future Baseline Condition at McKinley High School Sports Field Looking Ewa

In both the TOD Alternatives A and B, the Blaisdell Center was identified as an opportunity for a joint development between the HCDA and the City/County, and a potential location for residential, hotel and affordable housing development, in addition to a redeveloped arena, performing arts center and a new public green. Here, an additional full street improvement is proposed directly `Ewa of the site.

In the TOD Alternative A (Photo Plate 4-29), visible from the McKinley High School is a redeveloped Blaisdell Center, including an optional 700' tall tower. The total capacity assumed for the site is comparable to that allowed under the Future Baseline Condition; approximately 3.5 FAR. However, permitting a taller structure would accommodate a more consolidated footprint. In particular, the placement of a 700' tall structure somewhere on the Blaisdell site (with market or luxury residential units or a hotel) may

also lead to higher revenues permitting the funding of additional public amenity, such as the public open space seen in Vantage Point 6. Furthermore (not shown in the illustration) additional reserved housing could also be accommodated on the site.

Photo Plate 4-29: Visual Impact of TOD Alternative A at McKinley High School Sports Field Looking Ewa (with one tower at 690 Pohukaina Street)

Photo Plate 4-30: Visual Impact of TOD Alternative A at McKinley High School Sports Field Looking Ewa (with two towers at 690 Pohukaina Street)

In TOD Alternative B, the development capacity on the Blaisdell Center site is the same as for the TOD Alternative A, but the capacity is spread between a greater number of smaller floorplates and shorter towers due to the 418 foot height limit (see Photo Plate 4-31). This results in reduced view blockage from Vantage Point 5. However the illustrations are

only general estimates of the mass and scale of potential developments and should be in no way confused with actual design proposals.

Photo Plate 4-31: Visual Impact of TOD Alternative B at McKinley High School Sports Field Looking Ewa (with two towers at 690 Pohukaina Street)

Vantage Point 6: Thomas Square Historic Park, looking Makai:

The view from Thomas Square Historic Park will be changed depending on the future redevelopment of the Blaisdell site. The Future Baseline Condition (Photo Plate 4-32) shows what could be built with the full redevelopment of the site at maximum allowable capacity (3.5 FAR), with a series of high-rise structures, without the additional amenity options.

As noted in Vantage Point 5, both the TOD Alternatives A and B explore an option to allocate a consolidated area of green, recreation space to extend the public use of Historic Thomas Square Park into the Kaka`ako district, and include additional street connections. The public ownership of the Blaisdell site would allow for potential park allocations, as well as a site that includes additional public amenity, provided that enough revenue generating uses (market residential units or a hotel/hotels) can help to pay for public amenities.

Photo Plate 4-32: Visual Impact of Future Baseline Condition from Thomas Square Looking Makai

Photo Plate 4-33: Visual Impact of TOD Alternative A from Thomas Square Looking Makai

Photo Plate 4-34: Visual Impact of TOD Alternative B from Thomas Square Looking Makai

Both Alternatives would result in reduced visual impact compared to the Future Baseline Condition, because the new buildings are set back further from the street. TOD Alternative A (Photo Plate 4-33) has a bigger visual impact than does the Alternative B (Photo Plate 4-34) because the main tower in the Blaisdell site is 700 feet tall, as opposed to 418 feet tall. Design and placement of buildings would change depending on specific development proposals.

Vantage Point 7: Coral Street and Ilalo Street, Mauka

The Future Baseline Condition depicts proposed development associated with the Kamehameha Schools Master Plan on Ala Moana Boulevard and an individual parcel (see Photo Plate 4-35). These buildings generally constitute only one tower per site, with no new street access points. Allowable building heights and basic massing are included for parcels makai of the Ala Moana Boulevard. This street is not identified within the Mauka Area Rules as a "view corridor street". This street leads into Mother Waldron Neighborhood Park, with a development site located directly mauka of the park.

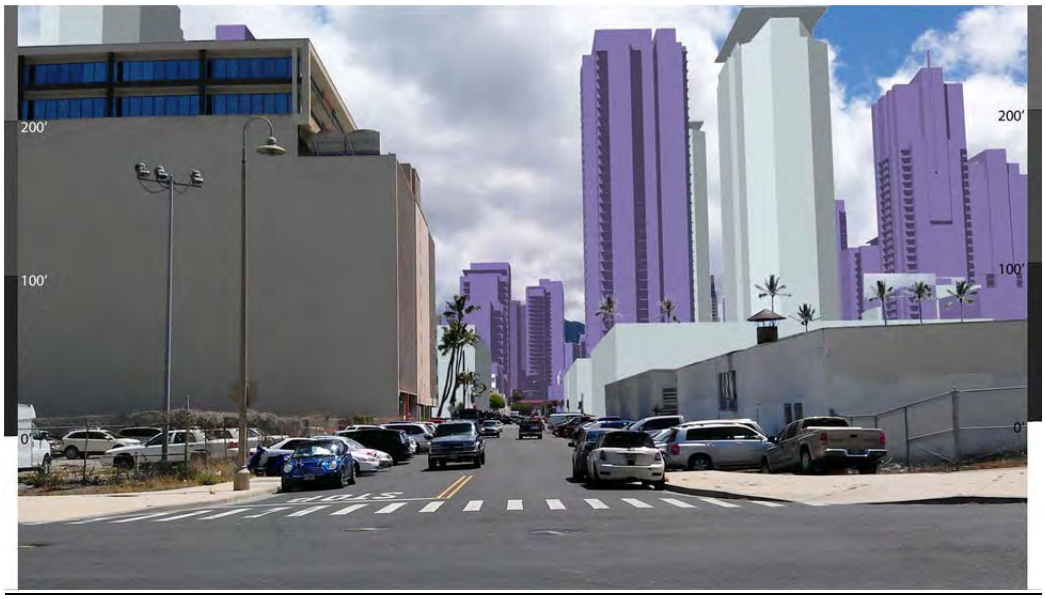
Photo Plate 4-35: Visual Impact of Future Baseline Condition from Coral Street at Ilalo Street Looking Mauka

TOD Alternative A allows for significant development in this area adjacent to Civic Center Station. This vantage point presents two options for the 690 Pohukaina project – the provision of a single 650' tall tower that would met the proposed criteria for an exceptional circumstance and an "Iconic Tower" (see Photo Plate 4-36), and two 400' towers that would require no changes to existing development standards (see Photo Plate 4-37). Developments are also depicted diamond head to Mother Waldron Neighborhood Park, and on an identified TOD site makai of the rapid transit alignment.

Photo Plate 4-36: Visual Impact of TOD Alternative A from Coral Street at Ilalo Street Looking Mauka (with one tower at 690 Pohukaina Street)

Photo Plate 4-37: Visual Impact of TOD Alternative A from Coral Street at Ilalo Street Looking Mauka (with two towers at 690 Pohukaina Street)

Photo Plate 4- 38: Visual Impact of TOD Alternative B from Coral Street at Ilalo Street Looking Mauka



Compared to the TOD Alternative A, the TOD Alternative B has significantly reduced impacts on views to the sky down the Coral Ave corridor, but views of the mountains are increasingly obstructed (Photo Plate 4-38).

Vantage Point 8: View from the entrance of the National Cemetery, 2195 Puowaina Drive

There is an extensive view towards the southern shoreline from Punchbowl. Both Alternatives show the proliferation of new high-rise structures. Those structures in the Future Baseline Condition are the same height as the existing buildings in Kaka`ako (Photo Plate 4-39).

Photo Plate 4-39: Visual Impact of Future Baseline Condition from Punchbowl

TOD Alternative A provides the potential for taller structures, with a 700' tall tower on Blaisdell Center meeting the criteria for an "iconic tower" (Photo Plate 4-40). Three towers extend above the existing buildings in the view shed, and create a small additional amount of view blockage of the ocean.

For the TOD Alternative B, new buildings do not extend beyond the height of existing buildings in the view shed, and only create a very slight additional view blockage of the ocean (Photo Plate 4-41).

Photo Plate 4-40: Visual Impact of TOD Alternative A from Punchbowl

Photo Plate 4-41: Visual Impact of TOD Alternative B from Punchbowl

Shade and Shadows: Development of taller buildings results in increased shading throughout the area, which could periodically affect street environments, smaller buildings, and open spaces, particularly if these areas are located to the north of new development. Shadow impacts are temporary and are influenced by the height, building location etc.

Computer modeling was conducted utilizing the position of the sun at the Spring Equinox (the day when the sun crosses the equator and the length of day and night are equal) and Summer Solstice (the day when the sun is at its farthest point north of the equator, traditionally marking the first day of summer in the northern hemisphere).

A comparison between the existing 400' High Rise Building Type allowed in the Mauka Area Plan and the TOD Alternatives' tower typologies explores the extent of shadowing impact on key public spaces within the Mauka Area, Mother Waldron Neighborhood Park, Kawaiaha`o Church, the planned Cooke Street linear park and Historic Thomas Square Park. Illustrations that follow compare the existing tower typology under the Future Baseline Condition, TOD Alternative B, TOD Alternative A (with a single iconic tower at 690 Pohukaina Street), and TOD Alternative B (with two 418-foot towers at 690 Pohukaina Street). The floor plate controls maintain a slender profile – so that shadows move quickly across a path. Higher buildings generally result in longer shadows.

Figure 4-38: Shadow Impacts of Future Baseline Condition at Equinox (10am)

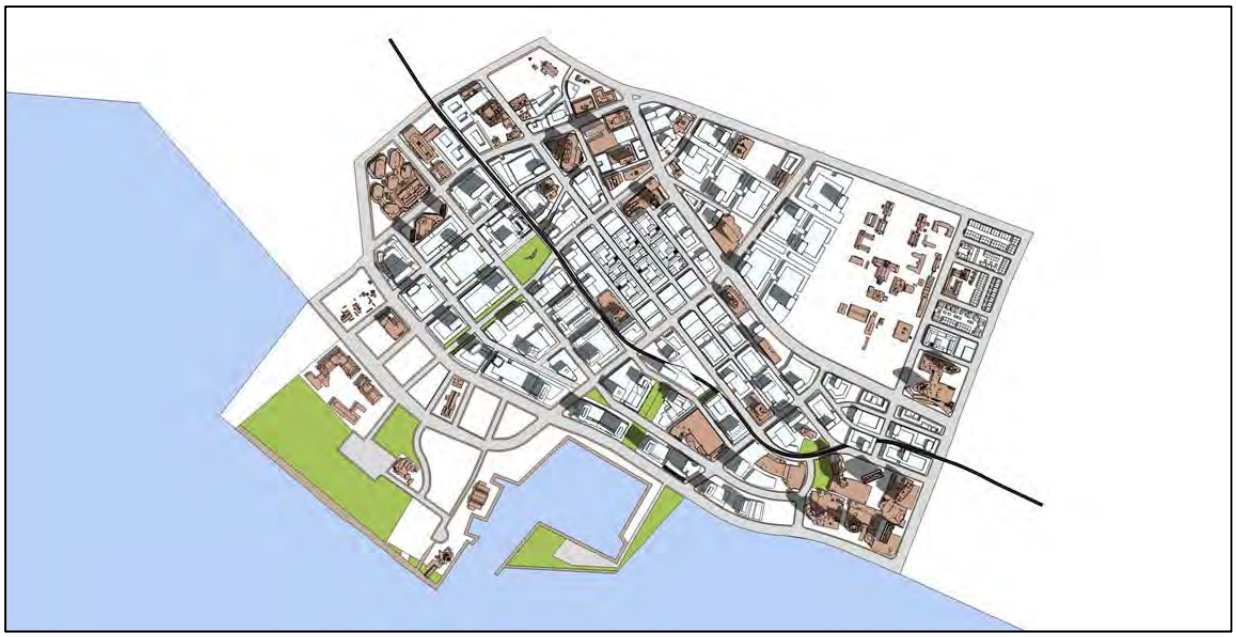


Figure 4-39: Shadow Impacts of Future Baseline Condition at Solstice (10am)

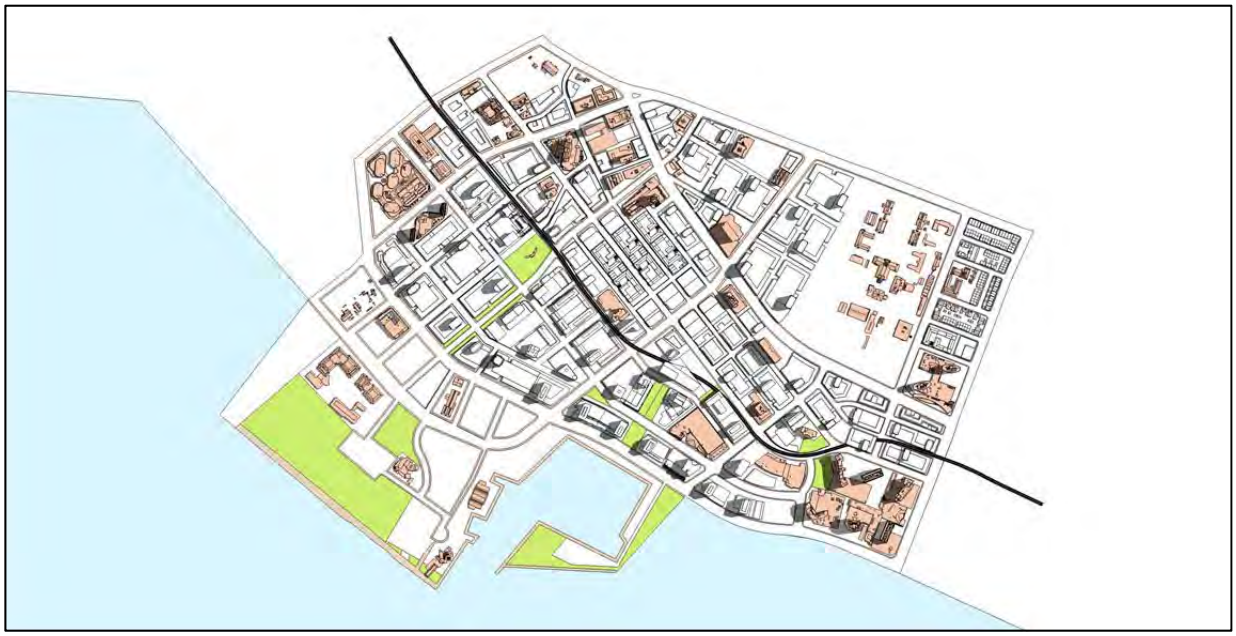


Figure 4-40: Shadow Impacts of Future Baseline Condition at Equinox (4pm)

Figure 4-41: Shadow Impacts of Future Baseline Condition at Solstice (4pm)

Figure 4-42: Shadow Impacts of TOD Alternative B at Equinox (10am)

Figure 4-43: Shadow Impacts of TOD Alternative B at Solstice (10am)

Figure 4-44: Shadow Impacts of TOD Alternative B at Equinox (4pm)

Figure 4-45: Shadow Impacts of TOD Alternative B at Solstice (4pm)

Figure 4-46: Shadow Impacts of TOD Alternative A (with single tower at 690 Pohukaina) at Equinox (10am)

Figure 4-47: Shadow Impacts of TOD Alternative A (with single tower at 690 Pohukaina) at Solstice (10am)

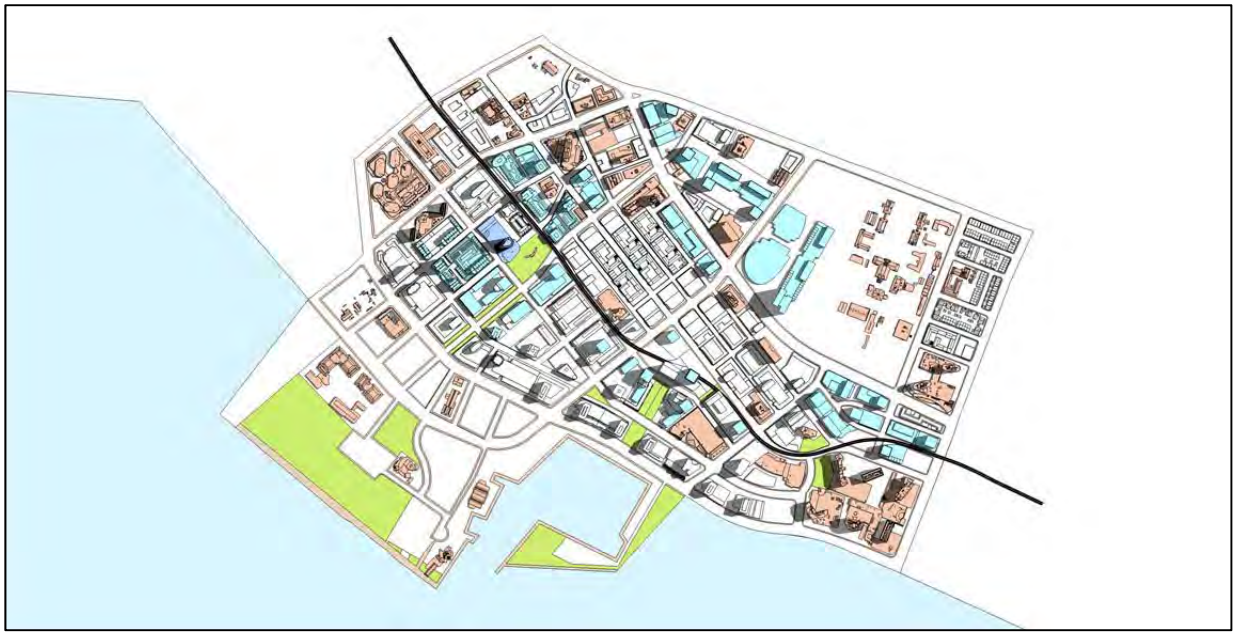


Figure 4-48: Shadow Impacts of TOD Alternative A (with single tower at 690 Pohukaina) at Equinox (4pm)

Figure 4-49: Shadow Impacts of TOD Alternative A (with single tower at 690 Pohukaina) at Solstice (4pm)

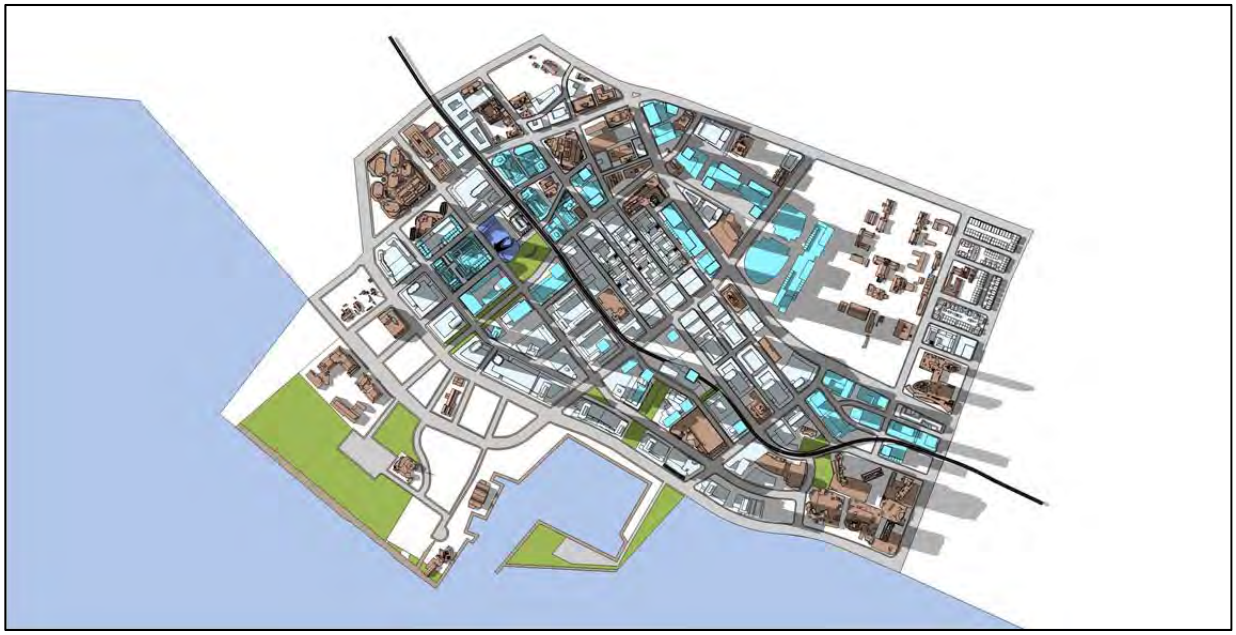
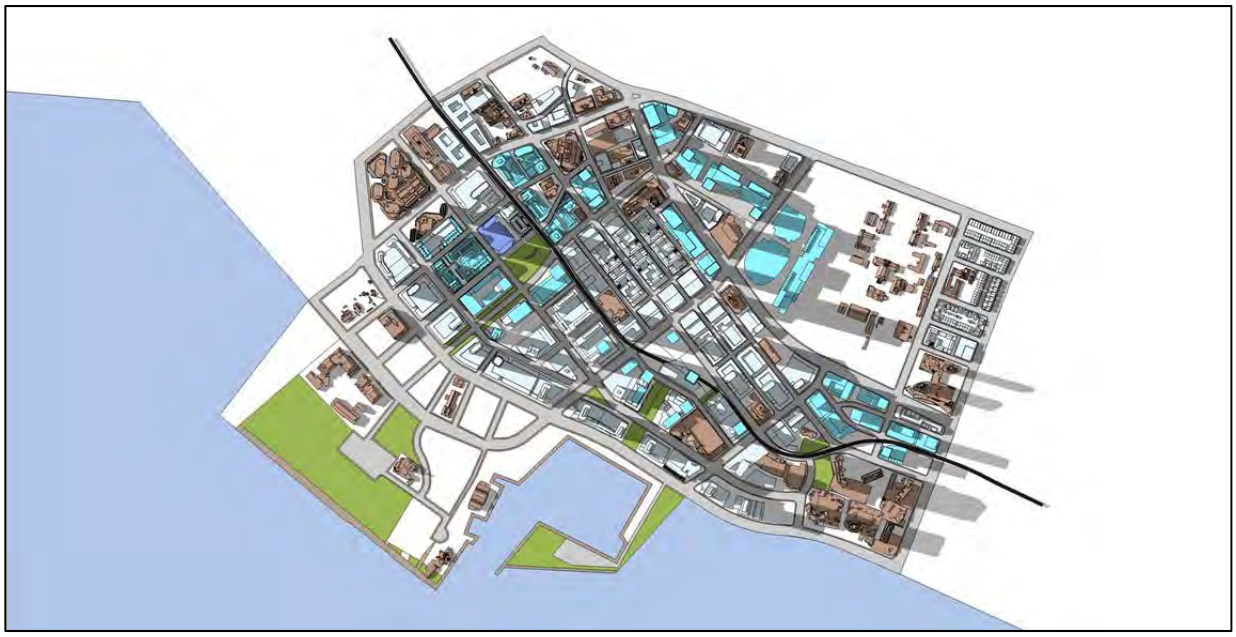


Figure 4-50: Shadow Impacts of TOD Alternative A (with two towers at 690 Pohukaina) at Equinox (10am)

Figure 4-51: Shadow Impacts of TOD Alternative A (with two towers at 690 Pohukaina) at Solstice (10am)

Figure 4-52: Shadow Impacts of TOD Alternative A (with two towers at 690 Pohukaina) at Equinox (4pm)

Figure 4-53: Shadow Impacts of TOD Alternative A (with two towers at 690 Pohukaina) at Solstice (4pm)



Light and Glare: Alteration of natural light will continue with the on-going urbanization of the Kaka`ako District. The light and glare impact that could occur is generally consistent in both alternatives. Views in and out of buildings are desirable for public safety and pedestrian comfort. Chapter 217-22-55 (k.2), HAR, requires that visible light transmission level of windows on the ground floor shall be 50% or greater.

New and renovated structures would provide additional light sources at night within the Mauka and Makai Areas, including interior and exterior building lighting and security lighting, which would be noticeable from adjacent neighborhoods on Punchbowl. With the Proposed Action, additional vehicular traffic is anticipated within the area, which would result in additional light from vehicles entering and leaving the area. Additional light resulting from any one of the development alternatives, however, is not anticipated to result in any significant impacts. Cumulatively, the construction of new towers envisioned under the Proposed Action (either Alternative) would represent an increase in ambient nighttime light over the Future Baseline Condition.

The primary sources of glare from development would be direct nighttime glare from lighting sources, (e.g., building and security lighting, vehicle headlights) and reflective daytime solar glare from specular surfaces (e.g., glazing, luminaire housing, reflective surfaces on building facades and vehicles). New sources of light and glare would be similar to those that current exist in the Mauka Area and could be perceived as a

continuation of existing light and glare from Downtown Honolulu or Waikiki. As with shadows, reflected solar glare impacts are also influenced by climatic conditions. No significant glare related impacts are anticipated. Chapter 217-22- 55 (k), HAR, mitigates adverse light and glare impacts by prohibiting highly reflective, mirrored and opaque window glazing.

Open Space and Public Realm: Ongoing redevelopment of the Kaka`ako District under the Proposed Action (either TOD Alternative), Mauka Area Rules and Makai Conceptual Master Plan will result in a large population of both full-time and employee residents in a more intensive land use pattern. In the Mauka Area, it is unlikely that the HCDA will be able to purchase a new major property to be allocated for parkland.

Recognizing that land in the KCDD is primarily developed by the private sector, both the Future Baseline Condition, and Proposed Action (either TOD Alternative) seek to leverage private investments by requiring developers to provide active public recreational spaces either on or off-site that are accessible to residents and local users. The Alternatives include an allocation of 7% of net sq. ft as recreation area for building users that is comparable to the Future Baseline Condition requirement of 55 sq. ft of space per unit, but does not penalize small units. Rather, this means that both smaller and larger units would result in an amount of recreation area that is proportional to the size of the unit. For example, a 1,500 sq. ft unit (a typical 2 or 3 bedroom) would allocate 105 sq. ft of space, while a smaller studio apartment at 650 sq. ft would be required to allocate 42 sq. ft. Both the Alternatives and Future Baseline Condition maintain a minimum of 15% of lot area as public active space. This required public active space could be allowed on above-grade on podiums or addressed through an in-lieu program.

Mother Waldron Neighborhood Park is adjacent to the proposed ~~HART~~ ***light metro rail*** alignment (along Halekauwila), the 690 Pohukaina property, and new Halekauwila Place – a 19 story affordable housing project. The park is also surrounded by potential sites eligible for participation in the TOD Overlay Plan, and to the south, the Kamehameha Schools Master Plan. As a result, the future context of Mother Waldron Neighborhood Park may be oriented towards, a more activated park space with public improvements that animate and improve the existing park.

4.12.6 Recommended Measures to Mitigate Impacts

4.12.6.1 Urban Design

The following mitigation measures apply to the Proposed Action, and are based on existing HCDA policy[58], as well as new policy proposed in the draft TOD Overlay Plan

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58 Chapter 15-217, HAR, establishes Development and Design Standards for the KCDD Mauka Area. Sub Chapter 2 "Regulating Plan and Neighborhood Zones" establishes the Regulating Plan, Neighborhoods Zones, Building Types, Frontage Types, and the Open Space Plan. Sub Chapter 3 establishes Area Wide Standards including Building Placement, Building Form, Architectural Design, Landscape and Recreation Space, Adequate Infrastructure, Large Lots, Green Building, Encroaching Elements, Historic and Cultural Sites, Parking and Loading and Conditional Use of vacant land.

document. These mitigation measures are proposed in the TOD Overlay Draft Plan, and together with more specific measures developed in implementing rules, can help to mitigate impacts described in Section 4.12.5 of this EIS.

Table 4-77: Urban Design Mitigation Measures

TOD Overlay Plan Strategy	Intent	Alternative
Strategy LU 6 MA 3	This strategy seeks to improve the quality of urban experience related to the minimization of the automobile's impact on streets and land uses. This may have an impact on a reduction of the scale of parking structures in the Kaka`ako District and will improve the comfort of the street environment. This strategy is to be applied concurrently with measures to support street-level building activation and adequate provision of transportation alternatives.	A and B
New tools for Vibrant Neighborhoods	In both Alternatives, the capacity increase is an opt-in program provided land areas meet minimum thresholds. Additional capacity achieved under the program is not given "as of right," but is allocated upon the contractual obligation for the timely receipt of identified public goals, including affordable housing, and new public amenity – such as park space, civic programs, street grid enhancements, new pedestrian links or vehicular connections. To guide this process, HCDA should devise an appropriate "needs assessment" and make available an inventory of desired, and priority amenities, and their relative costs. HCDA should evaluate the value of these amenities and tie their provision using a point system or other basis to the delivery of added capacity.	A and B
Strategy UDI	This strategy directs the HCDA to adopt a revised set of form-based, transit-friendly building types that will allow for increased capacity, while avoiding monolithic, overly uniform buildings or inward facing buildings. High Rise Building types are generally outlined in Chapter four of the Draft TOD Overlay Plan. HCDA should codify these proposed building types to coordinate with and ensure compatibility with existing design and development standards in Chapter 15-217. HCDA to consider: • Definitions and standards for proposed TOD Overlay Building Types; • Refinements to site design for pedestrian and vehicular access, parking and loading as needed; • Standards, design guidelines and review criteria specific to TOD Overlay High Rise structures; (see also guidelines for Family Housing and Design Review) • Guidelines or standards to improve transitions between large buildings and small-scale development. • Provisions for modification of standards by HCDA's Executive Director	A and B

Strategy UD 4	This strategy directs HCDA to expand the existing Design Review process to cover all projects that meet or exceed identified minimum size thresholds. It also directs the agency to engage a Design Review Panel, establish design guidelines and principles to guide the TOD Overlay development process, and provide adequate opportunity for public review and community input for new projects.	
Strategy MA1	Tied to the urban design quality of the buildings, this strategy is focused on the scale of the development site. In reference to Chapter 15-217-58 Large Lots, this strategy directs HCDA to develop tools to implement a fine-grained street network within TOD Overlay redevelopment areas that promote walkability and pedestrian orientation of TOD Developments. In particular this Strategy directs HCDA to consider requiring through-block pedestrian connections where an adequate lot size allows for two projects on a block, or where projects are mostly commercial. This strategy also directs HCDA to consider requiring the Master Plans in its Plan area to meet a minimum intersection density requirement.	A and B
Strategy MA 3	Building upon the existing Mauka Area Rules, this strategy will improve pedestrian orientation and comfort by providing an array of strategies that will reduce vehicle and pedestrian conflicts at the street level. Specifically in terms of building design, this strategy also encourages HCDA to limit driveway access on identified streets to better promote pedestrian and non-motorized movement.	A and B
Strategy SA1 SA 7 SA 9	This strategy seeks to improve street connectivity in the ½ mile around the HART ~~rapid transit~~ ***light metro rail*** stations, and prioritizes pedestrian crossings and pedestrian facility improvements. This strategy directs HCDA to improve the areas around the station, including streets, paths, signage and connections to feeder transit. This strategy also directs HCDA to advocate for, and ensure that on developments located close to new rapid transit stations, designs are vetted to ensure both pedestrian safety and comfort.	A and B
Strategy SA 10	This strategy directs the HCDA to partner with and other relevant agencies to coordinate proposed rapid transit station design with future TOD redevelopment, and circulation plans to achieve desired transit friendly land uses and design strategies. Station and alignment integration opportunities for Kaka`ako, Civic Center and aloha Tower District are identified in the plan. (Draft TOD Overlay Plan Figures: 7-12, 7-13, 7-14, 7-15.)	
Strategy PT 1	This strategy alters capacity regulations in the TOD Overlay to include square footage of building area devoted to parking as part of the calculated Floor Area. This is intended to encourage more efficient use of space, and reduce the likelihood of over-building of parking areas. Support and outreach to the development community on planning and opportunities for more efficient parking utilization may be required.	A and B
Strategy PT 4	This strategy establishes a shared parking district to reduce vehicle trips and share between uses, and create a more welcoming environment. Improve urban design by reducing the amount of area dedicated to parking spaces.	A and B

Strategy PT 9 and 10	This strategy requires Transportation Demand Management for new residential developments to reduce overall auto dependence, and help to reduce the need for multiple cars. See TOD TDM Strategies Menu, 8-16.	A and B
	Family Compatible Housing: a major requirement for the TOD Overlay plan is provide a range of housing types and market places, including unit diversity. The HCDA should provide an analysis of the types of housing opportunities in the Mauka Area under the TOD Plan and provide guidance for successful family housing. Guidelines should be applicable to BOTH affordable and market rate projects and encourage the integration of residents at various income levels and tenants with and without children into projects. For example the City of Vancouver "High Density Housing for Families with Children Guidelines."	A and B

4.12.6.2 Views

The ocean or mountain views experienced by existing high-rise dwellers are not protected under City or State regulations. However, a method for considering the significance attributed to both distant and near-by views will help to maintain the KCDD's long-term residential desirability. This can be accomplished by providing guidelines that ensure that building placement is neighborly, and a balanced distance between towers and housing complexes is maintained. Partial or framed views can also be preserved through the appropriate siting of towers, staggering building placement, and enforcing required spacing.

The existing Mauka Area Rules include policies for View Preservation. Ch 12-217-53 Architectural Design regulates the placement of new buildings in relationship to the Mauka-Makai view corridors. Both TOD Alternatives propose to

- Maintain the 80' high-rise tower separation rules.
- Maintain tower floor plate maximums. These maximums are designated by building type, and when combined with maximum tower dimensions ensure a more slender building profile. This will reduce the effect of a monolithic wall of development, and impact on the mauka-makai view shed.
- Maintain maximum dimension in mauka-makai axis, and maximum tower dimension.

HCDA may consider adjustments to the view preservation rules as discussed in the following sections.

4.12.6.3 Tower Siting and Design

Develop a guideline that addresses issues identified in the TOD Draft Plan (Appendix A, table 4-2 – Building Siting and View Preservation), applicable to either TOD Alternative. Guidelines should at minimum address the following:

- Show prototypical development lots, with preferred site design for staggered or offset towers;
- Encourage staggered heights (tower configurations should provide skyline diversity; and
- Examples for appropriate building tops.

4.12.6.4 Street Level Setbacks

Revise Rules for either TOD Alternative that are in conflict with TOD Overlay Plan objectives. For example:

- Revise standard (ch 15-217-55 (4) for view corridor streets in the TOD Overlay Area to regularize the setback allowed in the Master Plan areas, at 75' above the Street Element. This will meet the TOD Objective of increased capacity, and improved pedestrian environment.
- Revise rule 15-217-54 (c) that requires an increased setback by three feet for every ten feet of building height. These rules are in conflict with building types as proposed and would negate the ability for large parcels to place multiple buildings on a development parcel by reducing flexibility and pushing development to one side of the development parcel.
- Revise Mauka Area Rule designating 25% of tower "void" space to be located at the street frontage.
- Revise Mauka Area Rule designating 65% of tower to be located on street frontage.

4.12.6.5 Incorporate Green Landscaped Podiums

As the number and frequency of towers increases, HCDA may encourage developments to better address and consider internal views. HCDA will require a portion of rooftops to include aesthetic treatments, as well as meet open space objectives. To encourage green roofs as a best practice within Kaka`ako, HCDA will create a green roof policy and provide technical support appropriate to the Hawaiian climate, with resources and guides for developers. HCDA will consider appropriate incentive mechanisms as necessary.

4.12.6.6 Provide Public Access

For Iconic Towers in TOD Alternative A, include a provision for the public to access the view, by providing for a public lobby, restaurant, or other public space on top floors.

4.12.6.7 Flight Path (Honolulu International Airport)

In order to ensure that buildings do not obstruct the flight path and airspace established in consultation with the FAA, maximum building heights in this area of KCDD will be adjusted to ensure that buildings do not penetrate the airspace.

- A vertical safety buffer below the approach surface will be considered to ensure adequate separation between the airspace and building rooftops.
- Consideration will be given to limiting the height of rooftop appurtenances (e.g., antennae, flag poles, etc.) proximate to the flight path that could penetrate the airspace or the associated safety buffer.
- Consideration will also be given as part of the HCDA's design review process to limiting rooftop specular surfaces that can act as a distraction for pilots.
- Proximate to the flight path, consideration will be given to limiting electrical interference on frequencies used by aircraft.

4.12.6.8 Light and Glare

Strategy UD 3 in the Draft TOD Overlay Plan builds upon Chapter 15-217-55 Architectural Design and further directs the HCDA to consider the impact of shadowing on the public realm to reduce shading on public spaces and parks. This is applicable to either TOD Alternative. Other strategies appropriate to an urban environment such as Kaka`ako are the limiting the area and intensity of illumination;

- limiting the location or angle of illumination;
- limiting the hours of illumination; and
- providing landscaping at the street level that will absorb light.

Other measures that may be also employed include:

- installation of screening, overhangs, or shielding to minimize spillover lighting impacts – particularly near sensitive residential receivers;
- shielding exterior lighting fixtures and directing site security lighting away from nearby residential uses;
- including pedestrian-scaled and pedestrian-oriented lighting for safety along sidewalks, parking areas, street crossings and building access points;
- employing timers or motion sensors for lighting to reduce spillover lighting and generally reduce ambient light levels;
- avoiding large expanses of smooth, uniform, reflective building surfaces;
- incorporating architectural relief and detail, such as exterior sun shades, deep spandrels, mullions or other features of façade articulation, that reduce reflectivity; and
- as necessary, undertaking project-specific solar impact analysis studies to determine the extent of light and/or glare impacts and to identify specific mitigation measures.

4.12.6.9 Open Space and Public Realm

The Mauka Area Rules identify a variety of strategies to secure needed open, active public space to ensure that the growing neighborhood contains adequate resources. In addition to the recreational requirement, under the existing Mauka Area Rules, developers are

required to dedicate public facilities in the amount of three percent of the total commercial floor area of the development (exclusive of nursing facilities and assisted living facilities). Additionally, developers are required to dedicate four percent of the total residential floor area, exclusive of floor area devoted to reserved housing unit. If it is determined that dedicating land is not in the best interest of the public, the developer shall pay instead a fee in the sum equal to the fair market value of the land area required. HCDA may expend the moneys for the purchase, creation, expansion, or improvement of public facilities, including parks and recreational facilities.

Other measures that may be employed include:

- Construction of improved pedestrian connections to nearby public parks (Kewalo Basin, Kaka`ako Waterfront Park, Ala Moana Beachfront Park, Thomas Square Historic Park).
- Explicit shared use of existing public recreation facilities: McKinley High School campus contains the most significant publically owned recreation facilities including softball courts, baseball field, tennis courts, basketball and volley ball courts and a football/soccer field surrounded by a track. As noted in the 2009 Mauka Area Plan FEIS, a more formal school/community use arrangement, combined with the improvement of the adjoining three and a half acre site, is a practical option for making a wide range of active outdoor recreation facilities available to the public.
- Improving connecting links and access within the District. Greenways identified in the Mauka Area Rules are Cooke Street, Pohukaina Street, Kamakee Street, and Piikoi Street.

The Proposed Action will apply these strategies for either TOD Alternative. HCDA will also explore opportunities for quasi-public parcels at the Blaisdell Center and the HECO facility (between Cooke St, Ward Ave, S. King Street and Kapiolani) for larger, consolidated park spaces for use by the Kaka`ako community. Either TOD Alternative would include the creation of two small plazas located at both Civic Center Station, and Kaka`ako Stations associated with the ~~HART rapid transit~~ ***light metro rail*** system.

Further strategies for park and Public realm enhancements follow:

Table 4-78: Park and Public Realm Strategies

TOD Overlay Plan Strategy	Intent	Alternative
New Tools for Vibrant Neighborhoods	This strategy directs HCDA to develop a needs assessment process to work with the KCDD community to understand and prioritize a set of public amenities to be tied to the provision of new density. This process should be revised with enough frequency to capture demographic shifts in the area, be coordinated with the City and County of Honolulu such as those amenities that address the needs of diverse populations, such as senior populations, youth	A and B

	populations or day-time employees.	
Strategy LU4 Strategy MA8	This strategy encourages the HCDA to allow for temporary uses, repurposing spaces such as parking lots, low traffic streets, and into a resource that can be used to provide communities activities.	A and B
Strategy MA 9	This strategy directs the HCDA to transform existing and proposed corridors into greenways as identified in the Draft TOD Overly Plan: Cummins Street, connecting the Blaisdell Center to Ala Moana Beach Park; Auahi Street connecting between the Auahi and Pauahi neighborhoods; Punchbowl Street, and Ilalo street within Makai. The Plan also recommends green treatments for Aloha Tower Drive. (Figure 5-10 TOD Overlay Plan)	A and B
Guidelines Public Parks P4-23	HCDA will introduce new types of spaces in the Mauka Area, and activate existing green spaces. Guidelines identify a variety of public realm options as identified including “promenades,” “community gardens,” and “public squares and plazas.” This is especially appropriate for new internal pedestrian passageways in new private development sites.	A and B
Strategy MA 7	Directs HCDA to complete a set of Complete Streets Design Standards for gracious sidewalks that invite pedestrian travel.	A and B

Chapter Five: Relationship to Land Use Policies and Controls

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5.0 Relationship to Land Use Plans, Policies, and Controls

5.1 Federal Policies and Controls

This chapter discusses the relationship of the Proposed Action to applicable plans, policies, and controls of the federal government, State of Hawai`i, and the City and County of Honolulu.

5.1.1 Coastal Zone Management

Section 307 of the National Coastal Zone Management (CZM) Act of 1972 provides for State review of federal actions or permits affecting the coastal zone of states with an approved CZM program. Unlike other states, the entire land mass of the State of Hawai`i is considered to be part of the Coastal Zone. Any federal action conducted in Hawai`i therefore requires a Certificate of Consistency to ensure that it complies with the requirements of the CZM Act.

Hawai`i's CZM program was established pursuant to Chapter 205A, HRS, and is administered by the State Office of Planning. The program provides for the beneficial use, protection, and development of the State's coastal zone. Under the State program, a coastal zone has been delineated along the coast of each island and designated the Special Management Area (SMA). Any activity defined as development by Chapter 205A, HRS, requires that an application for a SMA Use Permit be filed with the regulating County agency, or in the instance of the KCDD, with the State Office of Planning. Further discussion of the SMA requirements is provided in Section 5.3.3 below.

5.1.2 FEMA National Flood Insurance Program

The National Flood Insurance Act of 1968 established a nationwide program to delineate flood-prone areas and provide insurance opportunities to property owners in those designated areas. The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM) are utilized by building departments and development agencies throughout the country to establish flood control policies and building code requirements in designated flood zones. All development must comply with flood zone regulations.

5.1.3 National Historic Preservation Act of 1966

The 1966 National Historic Preservation Act established a mechanism for protecting and preserving valued historic and archaeological resources, including architectural resources. In Hawai`i, the provisions of the federal law are implemented and

enforced by the State Historic Preservation Division of the Department of Land and Natural Resources, pursuant to Chapter 6E, Hawaii Revised Statutes, as amended. In instances where archaeological and/or cultural artifacts such as burials are discovered during excavation of property in Kaka`ako, the work crew is required to stop work and to contact the State Historic Preservation Officer at DLNR to determine whether the provisions of Chapter 6E are applicable and how to proceed.

5.2 State Plans, Policies, and Controls

Numerous state plans, polices, programs and controls provide goals, objectives, and priority actions to provide guidelines for development within the State of Hawai`i. Following is a review of those that are most applicable to the KCDD.

5.2.1 Hawaii State Land Use Law (Chapter 205, HRS)

Under this law, all lands in the State of Hawai`i are classified as one of four categories: Urban, Conservation, Agricultural, or Rural. The KCDD is designated as Urban. Jurisdiction over Urban lands rests with the County in which the lands are located.

5.2.2 Hawaii State Plan (Chapter 226)

In 1978, the Department of Planning and Economic Development (now known as the Department of Business, Economic Development and Tourism, or "DBEDT") completed the Hawaiʻi State Plan to: (1) improve the planning process; (2) increase the effectiveness of government and private actions; (3) improve coordination among agencies and levels of government; (4) provide for the wise use of Hawaiʻi's resources; and (5) guide the future development of the State. (State of Hawaiʻi, Department of Planning and Economic Development, 1978, Revised 1989, 1991.)

The State Legislature subsequently adopted 1978 the Hawaiʻi State Planning Act (Planning Act), as HRS Chapter 226. The Planning Act consists of a series of broad goals, objectives and policies that serve as guidelines for future long-term growth and development. It further (1) provides a basis for determining priorities and allocating limited resources; (2) seeks to improve coordination of Federal, State, and County plans, policies, programs, projects, and regulatory activities; and (3) establishes a system for plan formulation and program coordination to provide for an integration of all major State and County activities.

The Planning Act is divided into three sections: Part I - Overall Theme, Goals, Objectives and Policies; Part II - Planning Coordination and Implementation; and Part III - Priority Guidelines. Part I of the Planning Act consists of three overall themes: (1) individual and family self-sufficiency; (2) social and economic mobility; and (3) community or social well-being. These themes are considered "basic functions of society" and goals toward which government must strive (HRS §226-3).

Part II of the Planning Act primarily addresses internal government policies to help streamline, coordinate, and implement various plans and processes between governmental agencies. It seeks to eliminate or consolidate burdensome or duplicative governmental requirements imposed on business, where public health, safety, and welfare would not be adversely affected. Part III of the Planning Act establishes overall priority guidelines to address areas of statewide concern (HRS §226-101). The overall direction and focus are on improving the quality of life for Hawai‘i’s present and future population through the pursuit of desirable courses of action (HRS §226-102). Following is a discussion of how the Proposed Action relates to these to Chapter 226.

Table 5-1: Compliance with Hawai`i State Planning Act – Part 1

SECTION	CHAPTER 226 - PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES	RATING
A = actively supportive C= conforms I = goal is inconsistent with applicant’s objectives NA = goal is not applicable		
226-1	Findings and purpose.	
226-2	Definitions.	
226-3	Overall Theme	
226-4	State Goals. In order to guarantee, for present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:	
(1)	A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawai‘i's present and future generations.	**A**
(2)	A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well being of the people.	**A**
(3)	Physical, social, and economic well being, for individuals and families in Hawai‘i, that nourishes a sense of community responsibility, of caring, and of participation in community life.	**A**
COMMENTARY: As a matter of State and County land use policy, the KCDD has been created to provide new residential opportunities. The Proposed Action is consistent with those policies. Implementation of Transit-Oriented Development contributes to the continued strengthening of the island economy. As the TOD Overlay is an incentive based program, Kaka`ako will continue to provide new residential opportunities with or without the Proposed Action. However, with the Proposed Action new residential opportunities are expected to increase.		
226-5	OBJECTIVE AND POLICIES FOR POPULATION	
(a)	It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter;	**A**
(b)	To achieve the population objective, it shall be the policy of this State to:	
(1)	Manage population growth statewide in a manner that provides	**A**

	increased opportunities for Hawai‘i’s people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county.	
(2)	Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.	**NA**
(3)	Promote increased opportunities for Hawai‘i’s people to pursue their socio-economic aspirations throughout the islands.	**C**
(4)	Encourage research activities and public awareness programs to foster an understanding of Hawai‘i’s limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawai‘i’s population.	**C**
(5)	Encourage federal actions and coordination among major governmental agencies to promote a more balanced distribution of immigrants among the states, provided that such actions do not prevent the reunion of immediate family members.	**NA**
(6)	Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state’s population.	**NA**
(7)	Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.	**A**
COMMENTARY: The Proposed Action is consistent with the CC&H’s population distribution policies. As the TOD Overlay is an incentive based program, Kaka`ako will continue to accommodate population growth with or without the Proposed Action. However, with the Proposed Action the population of the district will increase over what is anticipated under current rules.		
226-6	OBJECTIVES AND POLICIES FOR THE ECONOMY - IN GENERAL.	
(a)	Planning for the State's economy in general shall be directed toward achievement of the following objectives:	
(1)	Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai‘i’s people.	**A**
(2)	A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.	**C**
(b)	To achieve the general economic objectives, it shall be the policy of this State to:	
(1)	Expand Hawai‘i’s national and international marketing, communication, and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.	**NA**
(2)	Promote Hawai‘i as an attractive market for environmentally and socially sound investment activities that benefit Hawai‘i’s people.	**C**
(3)	Seek broader outlets for new or expanded Hawai‘i business	**C**

	investments.	
(4)	Expand existing markets and penetrate new markets for Hawai‘i’s products and services.	**C**
(5)	Assure that the basic economic needs of Hawai‘i’s people are maintained in the event of disruptions in overseas transportation.	**C**
(6)	Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.	**C**
(7)	Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawai‘i’s small-scale producers, manufacturers, and distributors.	**NA**
(8)	Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.	**C**
(9)	Foster greater cooperation and coordination between the government and private sectors in developing Hawai‘i’s employment and economic growth opportunities.	**C**
(10)	Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.	**C**
(11)	Maintain acceptable working conditions and standards for Hawai‘i’s workers.	**C**
(13)	Provide equal employment opportunities for all segments of Hawai‘i’s population through affirmative action and nondiscrimination measures.	**C**
(14)	Encourage businesses that have favorable financial multiplier effects within Hawai‘i’s economy.	**C**
(15)	Promote and protect intangible resources in Hawai‘i, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.	**C**
(16)	Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new, potential growth industries in particular.	**C**
(17)	Foster a business climate in Hawai‘i - including attitudes, tax and regulatory policies, and financial and technical assistance programs - that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.	**C**
COMMENTARY: While the Proposed Action focuses on residential development, the provision of new office space, commercial, and industrial land use opportunities are supportive of the State’s objectives.		
226-7	OBJECTIVES AND POLICIES FOR THE ECONOMY - AGRICULTURE	
(a)	Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:	
(1)	Viability of Hawai‘i’s sugar and pineapple industries.	**NA**
(2)	Growth and development of diversified agriculture throughout the State.	**C**
(3)	An agriculture industry that continues to constitute a dynamic and essential component of Hawai‘i’s strategic, economic, and social well-	**C**

	being.	
(b)	To achieve the agriculture objectives, it shall be the policy of this State to:	
(1)	Establish a clear direction for Hawai'i's agriculture through stakeholder commitment and advocacy.	**NA**
(2)	Encourage agriculture by making best use of natural resources.	**C**
(3)	Provide the governor and the legislature with information and options needed for prudent decision making for the development of agriculture.	**NA**
(4)	Establish strong relationships between the agricultural and visitor industries for mutual marketing benefits.	**NA**
(5)	Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawai'i's economy.	**NA**
(6)	Seek the enactment and retention of federal and state legislation that benefits Hawai'i's agricultural industries.	**NA**
(7)	Strengthen diversified agriculture by developing an effective promotion, marketing, and distribution system between Hawai'i's producers and consumer markets locally, on the continental United States, and internationally.	**NA**
(8)	Support research and development activities that provide greater efficiency and economic productivity in agriculture.	**NA**
(9)	Enhance agricultural growth by providing public incentives and encouraging private initiatives.	**NA**
(10)	Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.	**NA**
(11)	Increase the attractiveness and opportunities for an agricultural education and livelihood.	**NA**
(12)	Expand Hawai'i's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.	**NA**
(13)	Promote economically competitive activities that increase Hawai'i's agricultural self-sufficiency.	**NA**
(14)	Promote and assist in the establishment of sound financial programs for diversified agriculture.	**NA**
(15)	Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.	**NA**
(16)	Facilitate the transition of agricultural lands in economically nonfeasible agricultural production to economically viable agricultural uses.	**NA**
COMMENTARY: Because the Proposed Action is situated in the Urban district, it has no direct relationship to agricultural activities. However, continued development in the KCDD will help to reduce development pressures on rural and agricultural lands by		

redirecting growth to an existing urban growth center.		
226-8	OBJECTIVE AND POLICIES FOR THE ECONOMY - VISITOR INDUSTRY.	
(a)	Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawai'i's economy.	
(b)	To achieve the visitor industry objective, it shall be the policy of this State to:	
(1)	Support and assist in the promotion of Hawai'i's visitor attractions and facilities.	**C**
(2)	Insure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawai'i's people.	**C**
(3)	Improve the quality of existing visitor destination areas.	**NA**
(4)	Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.	**A**
(5)	Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawai'i's people.	**C**
(6)	Provide opportunities for Hawai'i's people to obtain job training and education that will allow for upward mobility within the visitor industry.	**C**
(7)	Foster a recognition of the contribution of the visitor industry to Hawai'i's economy and the need to perpetuate the aloha spirit.	**C**
(8)	Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawai'i's cultures and values.	**C**
COMMENTARY: Although the Proposed Action is focused on residential development, the inclusion of limited hotel development is supportive of the State's policies related to the visitor industry.		
226-9	OBJECTIVE AND POLICIES FOR THE ECONOMY – FEDERAL EXPENDITURES.	
(a)	Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawai'i's economy;	
(b)	To achieve the federal expenditures objective, it shall be the policy of this State to:	
(1)	Encourage the sustained flow of federal expenditures in Hawai'i that generates long-term government civilian employment.	**NA**
(2)	Promote Hawai'i's supportive role in national defense.	**NA**
(3)	Promote the development of federally supported activities in Hawai'i that respect state-wide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawai'i's environment.	**NA**
(4)	Increase opportunities for entry and advancement of Hawai'i's people	**NA**

	into federal government service.	
(5)	Promote federal use of local commodities, services, and facilities available in Hawai‘i.	**NA**
(6)	Strengthen federal-state-county communication and coordination in all federal activities that affect Hawai‘i.	**NA**
(7)	Pursue the return of federally controlled lands in Hawai‘i that are not required for either the defense of the nation or for other purposes of national importance, and promote the mutually beneficial exchanges of land between federal agencies, the State, and the counties.	**NA**
COMMENTARY: As the Proposed Action involves no federal programs, objectives and policies pertaining to federal expenditures are not applicable.		
226-10	OBJECTIVE AND POLICIES FOR THE ECONOMY – POTENTIAL GROWTH ACTIVITIES.	
(a)	Planning for the State’s economy with regard to potential growth activities shall be directed towards achievement of the objective of development and expansion of potential growth activities that serve to increase and diversify Hawai‘i’s economic base.	
(b)	To achieve the potential growth activity objective, it shall be the policy of this State to:	
(1)	Facilitate investment and employment in economic activities that have the potential for growth such as diversified agriculture, aquaculture, apparel and textile manufacturing, film and television production, and energy and marine-related industries.	**NA**
(2)	Expand Hawai‘i’s capacity to attract and service international programs and activities that generate employment for Hawai‘i’s people.	**NA**
(3)	Enhance and promote Hawai‘i’s role as a center for international relations, trade, finance, services, technology, education, culture, and the arts.	**NA**
(4)	Accelerate research and development of new energy- related industries based on wind, solar, ocean, and underground resources and solid waste.	**NA**
(5)	Promote Hawai‘i’s geographic, environmental, social, and technological advantages to attract new economic activities into the State.	**NA**
(6)	Provide public incentives and encourage private initiative to attract new industries that best support Hawai‘i’s social, economic, physical, and environmental objectives.	**NA**
(7)	Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research.	**NA**
(8)	Develop, promote, and support research and educational and training programs that will enhance Hawai‘i’s ability to attract and develop economic activities of benefit to Hawai‘i.	**NA**
(9)	Foster a broader public recognition and understanding of the potential benefits of new, growth-oriented industry in Hawai‘i.	**NA**
(10)	Encourage the development and implementation of joint federal and	**NA**

	state initiatives to attract federal programs and projects that will support Hawai‘i’s social, economic, physical, and environmental objectives.	
(11)	Increase research and development of businesses and services in the telecommunications and information industries.	**NA**
COMMENTARY: As the development of new residential opportunities in the KCDD is largely intended to help redistribute the existing population by making Kaka`ako a more attractive place to live, the Proposed Action will not attract new economic development to the State.		
226-10.5	OBJECTIVES AND POLICIES FOR THE ECONOMY – INFORMATION INDUSTRY.	
(a)	Planning for the State's economy with regard to the information industry shall be directed toward the achievement of the objective of positioning Hawai‘i as the leading dealer in information businesses and services in the Pacific Rim;	
(b)	To achieve the information industry objective, it shall be the policy of this State to:	
(1)	Encourage the continued development and expansion of the telecommunications infrastructure serving Hawai‘i to accommodate future growth in the information industry;	**C**
(2)	Facilitate the development of new business and service ventures in the information industry which will provide employment opportunities for the people of Hawai‘i;	**C**
(3)	Encourage greater cooperation between the public and private sectors in developing and maintaining a well-designed information industry;	**C**
(4)	Ensure that the development of new businesses and services in the industry are in keeping with the social, economic, and physical needs and aspirations of Hawai‘i’s people;	**C**
(5)	Provide opportunities for Hawai‘i’s people to obtain job training and education that will allow for upward mobility within the information industry;	**NA**
(6)	Foster a recognition of the contribution of the information industry to Hawai‘i’s economy; and	**C**
(7)	Assist in the promotion of Hawai‘i as a broker, creator, and processor of information in the Pacific.	**NA**
COMMENTARY: The redevelopment of the KCDD relative to the Proposed Action will provide new opportunities for improving broadband infrastructure in Urban Honolulu, thereby facilitating positive growth in the telecommunications industry.		
226-11	OBJECTIVES AND POLICIES FOR THE PHYSICAL ENVIRONMENT – LANDBASED, SHORELINE, AND MARINE RESOURCES.	
(a)	Planning for the State’s physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:	
(1)	Prudent use of Hawai‘i’s land-based, shoreline, and marine resources.	**A**

(2)	Effective protection of Hawai‘i’s unique and fragile environmental resources.	**A**
(b)	To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:	
(1)	Exercise an overall conservation ethic in the use of Hawai‘i’s natural resources.	**A**
(2)	Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.	**A**
(3)	Take into account the physical attributes of areas when planning and designing activities and facilities.	**A**
(4)	Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.	**A**
(5)	Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.	**A**
(6)	Encourage the protection of rare or endangered plant and animal species and habitats native to Hawai‘i.	**A**
(7)	Provide public incentives that encourage private actions to protect significant natural resources from degradation or unnecessary depletion.	**A**
(8)	Pursue compatible relationships among activities, facilities, and natural resources.	**A**
(9)	Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.	**A**
COMMENTARY: The Proposed Action actively promotes protection of natural resources and environmentally sensitive areas by promoting population growth in an existing urban area, thereby reducing development pressures on rural areas.		
226-12	OBJECTIVE AND POLICIES FOR THE PHYSICAL ENVIRONMENT – SCENIC, NATURAL BEAUTY, AND HISTORIC RESOURCES.	
(a)	Planning for the State’s physical environment shall be directed towards achievement of the objective of enhancement of Hawai‘i’s scenic assets, natural beauty, and multi-cultural/historical resources.	
(b)	To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to:	
(1)	Promote the preservation and restoration of significant natural and historic resources.	**A**
(2)	Provide incentives to maintain and enhance historic, cultural, and scenic amenities.	**C**
(3)	Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.	**C**
(4)	Protect those special areas, structures, and elements that are an integral and functional part of Hawai‘i’s ethnic and cultural heritage.	**C**

(5)	Encourage the design of developments and activities that complement the natural beauty of the islands.	**C**
COMMENTARY: As discussed in Chapter 4, historic and cultural resources in the District have been identified. HCDA is committed to ensuring the historic resources are protected and preserved.		
226-13	OBJECTIVES AND POLICIES FOR THE PHYSICAL ENVIRONMENT – LAND, AIR, AND WATER QUALITY.	
(a)	Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:	
(1)	Maintenance and pursuit of improved quality in Hawai'i's land, air, and water resources.	**A**
(2)	Greater public awareness and appreciation of Hawai'i's environmental resources.	**A**
(b)	To achieve the land, air, and water quality objectives, it shall be the policy of this State to:	
(1)	Foster educational activities that promote a better understanding of Hawai'i's limited environmental resources.	**C**
(2)	Promote the proper management of Hawai'i's land and water resources.	**C**
(3)	Promote effective measures to achieve desired quality in Hawai'i's surface, ground, and coastal waters.	**C**
(4)	Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i's people.	**C**
(5)	Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.	**C**
(6)	Encourage design and construction practices that enhance the physical qualities of Hawai'i's communities.	**A**
(7)	Encourage urban developments in close proximity to existing services and facilities.	**A**
(8)	Foster recognition of the importance and value of the land, air, and water resources to Hawai'i's people, their cultures and visitors.	**C**
COMMENTARY: The Proposed Action concentrates new urban density in an existing urban area, thereby making the best use of existing services and facilities. By redirecting population growth to the Primary Urban Center, development pressures on rural and urban-fringe areas will be reduced.		
226-14	OBJECTIVE AND POLICIES FOR FACILITY SYSTEMS – IN GENERAL.	
(a)	Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.	
(b)	To achieve the general facility systems objective, it shall be the policy of this State to:	

(1)	Accommodate the needs of Hawai'i's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.	**A**
(2)	Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.	**A**
(3)	Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.	**A**
(4)	Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.	**C**
COMMENTARY: As a mature urban area, the KCDD's ancillary infrastructure has been designed to accommodate urban growth.		
226-15	OBJECTIVE AND POLICIES FOR FACILITY SYSTEMS -- IN GENERAL.	
(a)	Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:	
(1)	Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.	**C**
(2)	Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.	**C**
(b)	To achieve solid and liquid waste objectives, it shall be the policy of this State to:	
(1)	Encourage the adequate development of sewerage facilities that complement planned growth.	**C**
(2)	Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.	**C**
(3)	Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.	**C**
COMMENTARY: The Proposed Action is in a location designated for urban growth. Additional infrastructure that may be necessary to support the Proposed Action will be provided as needed.		
226-16	OBJECTIVE AND POLICIES FOR FACILITY SYSTEMS – WATER.	
(a)	Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.	
(b)	To achieve the facility systems water objective, it shall be the policy of this State to:	
(1)	Coordinate development of land use activities with existing and potential water supply.	**C**
(2)	Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.	**C**

(3)	Reclaim and encourage the productive use of runoff water and wastewater discharges.	**C**
(4)	Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.	**C**
(5)	Support water supply services to areas experiencing critical water problems.	**C**
(6)	Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.	**C**
COMMENTARY: Adequate water resources exist to support development under the Baseline Condition. Additional demands on the water system posed by the Proposed Action will be addressed as needed.		
226-17	OBJECTIVES AND POLICIES FOR FACILITY SYSTEMS – TRANSPORTATION	
(a)	Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives:	
(1)	An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.	**A**
(2)	A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.	**A**
(b)	To achieve the transportation objectives, it shall be the policy of this State to:	
(1)	Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;	**A**
(2)	Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;	**A**
(3)	Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;	**A**
(4)	Provide for improved accessibility to shipping, docking, and storage facilities;	**C**
(5)	Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;	**A**
(6)	Encourage transportation systems that serve to accommodate present and future development needs of communities;	**A**
(7)	Encourage a variety of carriers to offer increased opportunities and advantages to interisland movement of people and goods;	**NA**
(8)	Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;	**NA**
(9)	Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;	**A**
(10)	Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of	**A**

	Hawai'i's natural environment;	
(11)	Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation;	**A**
(12)	Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives; and	**A**
(13)	Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.	**A**
COMMENTARY: The Proposed Action is specifically intended to take advantage of the development opportunities presented by the introduction of the HART *light metro rail* system in the KCDD. The presence of the light rail system will provide new transportation alternatives for the District's current and future residents. The Proposed Action is focused on making the KCDD a more walkable and bike-able community.		
226-18	OBJECTIVES AND POLICIES FOR FACILITY SYSTEMS – ENERGY	
(a)	Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all	
(1)	Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;	**C**
(2)	Increased energy self-sufficiency where the ratio of indigenous to imported energy use is increased;	**C**
(3)	Greater energy security in the face of threats to Hawai'i's energy supplies and systems; and	**NA**
(4)	Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use.	**C**
(b)	To achieve the energy objectives, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable energy services to accommodate demand.	
(c)	To further achieve the energy objectives, it shall be the policy of this State to:	
(1)	Support research and development as well as promote the use of renewable energy sources;	**C**
(2)	Ensure that the combination of energy supplies and energy-saving systems is sufficient to support the demands of growth;	**C**
(3)	Base decisions of least-cost supply-side and demand-side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;	**C**
(4)	Promote all cost-effective conservation of power and fuel supplies through measures including: (A) Development of cost-effective demand-side management programs; (B) Education; and (C) Adoption	**C**

	of energy-efficient practices and technologies;	
(5)	Ensure to the extent that new supply-side resources are needed, the development or expansion of energy systems utilizes the least-cost energy supply option and maximizes efficient technologies;	**NA**
(6)	Support research, development, and demonstration of energy efficiency, load management, and other demand-side management programs, practices, and technologies;	**NA**
(7)	Promote alternate fuels and energy efficiency by encouraging diversification of transportation modes and infrastructure;	**C**
(8)	Support actions that reduce, avoid, or sequester greenhouse gases in utility, transportation, and industrial sector applications; and	**C**
(9)	Support actions that reduce, avoid, or sequester Hawai'i's greenhouse gas emissions through agriculture and forestry initiatives.	**C**
COMMENTARY: Redevelopment of the KCDD affords landowners and developers opportunities to implement new energy saving technologies, which in turn, will help lower energy demand.		
226-18.5	OBJECTIVES AND POLICIES FOR FACILITY SYSTEMS – TELECOMMUNICATIONS.	
(a)	Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.	
(b)	To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand.	
(c)	To further achieve the telecommunications objective, it shall be the policy of this State to:	
(1)	Facilitate research and development of telecommunications systems and resources;	**C**
(2)	Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;	**C**
(3)	Promote efficient management and use of existing telecommunications systems and services; and	**C**
(4)	Facilitate the development of education and training of telecommunications personnel.	**NA**
COMMENTARY: The Proposed Action will require the expansion of the existing telecommunications systems to service the proposed project, including new opportunities for improvements to broadband service.		
226-19	OBJECTIVES AND POLICIES FOR SOCIO – CULTURAL ADVANCEMENT – HOUSING	
(a)	Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:	
(1)	Greater opportunities for Hawai'i's people to secure reasonably priced,	**A**

	safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low, low- and moderate-income segments of Hawai‘i’s population.	
(2)	The orderly development of residential areas sensitive to community needs and other land uses.	**A**
(3)	The development and provision of affordable rental housing by the State to meet the housing needs of Hawai‘i’s people.	**A**
(b)	To achieve the housing objectives, it shall be the policy of this State to:	
(1)	Effectively accommodate the housing needs of Hawai‘i’s people.	**A**
(2)	Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.	**A**
(3)	Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.	**A**
(4)	Promote appropriate improvement, rehabilitation, and maintenance of existing housing units and residential areas.	**NA**
(5)	Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.	**A**
(6)	Facilitate the use of available vacant, developable, and underutilized urban lands for housing.	**A**
(7)	Foster a variety of lifestyles traditional to Hawai‘i through the design and maintenance of neighborhoods that reflect the culture and values of the community.	**A**
(8)	Promote research and development of methods to reduce the cost of housing construction in Hawai‘i.	**C**
COMMENTARY: The provision of new affordable housing opportunities is a key component of the Proposed Action.		
226-20	OBJECTIVES AND POLICIES FOR SOCIO – CULTURAL ADVANCEMENT – HEALTH.	
(a)	Planning for the State’s socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives:	
(1)	Fulfillment of basic individual health needs of the general public.	**C**
(2)	Maintenance of sanitary and environmentally healthful conditions in Hawai‘i’s communities.	**C**
(b)	To achieve the health objectives, it shall be the policy of this State to:	
(1)	Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.	**NA**
(2)	Encourage improved cooperation among public and private sectors in	**NA**

	the provision of health care to accommodate the total health needs of individuals throughout the State.	
(3)	Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.	**NA**
(4)	Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.	**NA**
(5)	Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.	**C**
(6)	Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring, and enforcement.	**NA**
COMMENTARY: The Proposed Action will connect to regional infrastructure systems. On-site infrastructure improvements will be constructed to comply with relevant DOH and County standards. Collectively, the on-site and off-site systems will ensure that sanitary and healthful conditions are maintained for the benefit of the area's residents and visitors.		
226-21	OBJECTIVE AND POLICIES FOR SOCIO – CULTURAL ADVANCEMENT – EDUCATION	
(a)	Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.	**NA**
(b)	To achieve the education objective, it shall be the policy of this State to:	
(1)	Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.	**C**
(2)	Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.	**C**
(3)	Provide appropriate educational opportunities for groups with special needs.	**C**
(4)	Promote educational programs which enhance understanding of Hawai'i's cultural heritage.	**C**
(5)	Provide higher educational opportunities that enable Hawai'i's people to adapt to changing employment demands.	**C**
(6)	Assist individuals, especially those experiencing critical employment problems or barriers, or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.	**C**
(7)	Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.	**C**
(8)	Emphasize quality educational programs in Hawai'i's institutions to promote academic excellence.	**C**

(9)	Support research programs and activities that enhance the education programs of the State.	**C**
COMMENTARY: The HCDA is committed to working with the Department of Education to ensure that adequate educational opportunities will exist for all residents of the KCDD.		
226-22	OBJECTIVE AND POLICIES FOR SOCIO-CULTURAL ADVANCEMENT – LEISURE.	
(a)	Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being.	**NA**
(b)	To achieve the social service objective, it shall be the policy of the State to:	**NA**
(1)	Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State's fiscal capacities.	**NA**
(2)	Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and to enhance their participation in society.	**NA**
(3)	Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawaii's communities.	**NA**
(4)	Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.	**NA**
(5)	Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.	**NA**
(6)	Promote programs which assist people in need of family planning services to enable them to meet their needs.	**NA**
COMMENTARY: This objective and its policies are directed towards governmental responsibilities of social service agencies and are, therefore, beyond the scope of the Proposed Action.		
226-23	OBJECTIVE AND POLICIES FOR SOCIO-CULTURAL ADVANCEMENT – LEISURE.	
(a)	Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.	
(b)	To achieve the leisure objective, it shall be the policy of this State to:	
(1)	Foster and preserve Hawai'i's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.	**C**
(2)	Provide a wide range of activities and facilities to fulfill the cultural,	**C**

	artistic, and recreational needs of all diverse and special groups effectively and efficiently.	
(3)	Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.	**C**
(4)	Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.	**C**
(5)	Ensure opportunities for everyone to use and enjoy Hawaiʻi's recreational resources.	**C**
(6)	Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.	**C**
(7)	Provide adequate and accessible physical fitness programs to promote physical and mental well-being of Hawaiʻi's people.	**C**
(8)	Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.	**C**
(9)	Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawaiʻi's population to participate in the creative arts.	**C**
(10)	Assure adequate access to significant natural and cultural resources in public ownership.	**C**
COMMENTARY: As discussed in Chapter 4, a variety of new contemporary cultural activities have emerged in the KCDD and are anticipated to continue with implementation of the Proposed Action.		
226-24	OBJECTIVE AND POLICIES FOR SOCIO-CULTURAL ADVANCEMENT--INDIVIDUAL RIGHTS AND PERSONAL WELL-BEING.	
(a)	Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations.	
(b)	To achieve the individual rights and personal well- being objective, it shall be the policy of this State to:	
(1)	Provide effective services and activities that protect individuals from criminal acts and unfair practices and that alleviate the consequences of criminal acts in order to foster a safe and secure environment.	**C**
(2)	Uphold and protect the national and state constitutional rights of every individual.	**C**
(3)	Assure access to, and availability of, legal assistance, consumer protection, and other public services which strive to attain social justice.	**NA**
(4)	Ensure equal opportunities for individual participation in society.	**NA**

	COMMENTARY: The provision of a safe, livable community is a central component of the Proposed Action.	
226-25	OBJECTIVE AND POLICIES FOR SOCIO – CULTURAL ADVANCEMENT – CULTURE.	
(a)	Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawai'i's people.	
(b)	To achieve the culture objective, it shall be the policy of this State to:	
(1)	Foster increased knowledge and understanding of Hawai'i's ethnic and cultural heritages and the history of Hawai'i.	**C**
(2)	Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawai'i's people and which are sensitive and responsive to family and community needs.	**C**
(3)	Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawai'i.	**C**
(4)	Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawai'i's people and visitors.	**C**
COMMENTARY: The provision of a safe, livable community is a central component of the Proposed Action.		
226-26	SECTION 226-26 OBJECTIVES AND POLICIES FOR SOCIO – CULTURAL ADVANCEMENT – PUBLIC SAFETY.	
(a)	Planning for the State's socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:	
(1)	Assurance of public safety and adequate protection of life and property for all people.	**C**
(2)	Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.	**C**
(3)	Promotion of a sense of community responsibility for the welfare and safety of Hawai'i's people.	**C**
(b)	To achieve the public safety objectives, it shall be the policy of this State to:	
(1)	Ensure that public safety programs are effective and responsive to community needs.	**C**
(2)	Encourage increased community awareness and participation in public safety programs.	**C**
(c)	To further achieve public safety objectives related to criminal justice, it shall be the policy of this State to:	
(1)	Support criminal justice programs aimed at preventing and curtailing	**NA**

	criminal activities.	
(2)	Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.	**NA**
(3)	Provide a range of correctional resources which may include facilities and alternatives to traditional incarceration in order to address the varied security needs of the community and successfully reintegrate offenders into the community.	**NA**
(d)	To further achieve public safety objectives related to emergency management, it shall be the policy of this State to:	**NA**
(1)	Ensure that responsible organizations are in a proper state of readiness to respond to major war-related, natural, or technological disasters and civil disturbances at all times.	**NA**
(2)	Enhance the coordination between emergency management programs throughout the State.	**NA**
COMMENTARY: The provision of a safe, livable community is a central component of the Proposed Action.		
226-27	OBJECTIVES AND POLICIES FOR SOCIO-CULTURAL ADVANCEMENT – GOVERNMENT	
(a)	Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives:	
(1)	Efficient, effective, and responsive government services at all levels in the State.	**C**
(2)	Fiscal integrity, responsibility, and efficiency in the state government and county governments.	**C**
(b)	To achieve the government objectives, it shall be the policy of this State to:	
(1)	Provide for necessary public goods and services not assumed by the private sector.	**C**
(2)	Pursue an openness and responsiveness in government that permits the flow of public information, interaction, and response.	**C**
(3)	Minimize the size of government to that necessary to be effective.	**C**
(4)	Stimulate the responsibility in citizens to productively participate in government for a better Hawai'i.	**C**
(5)	Assure that government attitudes, actions, and services are sensitive to community needs and concerns.	**C**
(6)	Provide for a balanced fiscal budget.	**C**
(7)	Improve the fiscal budgeting and management system of the State.	**C**
(8)	Promote the consolidation of state and county governmental functions to increase the effective and efficient delivery of government programs and services and to eliminate duplicative services wherever feasible.	**C**
	COMMENTARY: As a public agency, the HCDA is committed to complying with these goals, objectives and policies.	

Table 5-2: Compliance with Hawai`i State Planning Act – Part III

SECTION	CHAPTER 226 - PART III. PRIORITY GUIDELINES	RATING
A = actively supportive C = conforms I = goal is inconsistent with applicant's objectives NA = goal is not applicable		
226-101	Establishes overall priority guidelines to address areas of statewide concern.	
226-102	Overall direction. The State shall strive to improve the quality of life for Hawai'i's present and future population through the pursuit of desirable courses of action in five major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, and quality education.	
226-103	ECONOMIC PRIORITY GUIDELINES.	
(a)	Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawai'i's people and achieve a stable and diversified economy:	
(1)	Seek a variety of means to increase the availability of investment capital for new and expanding enterprises.	NA
(A)	Encourage investments which:	
(i)	Reflect long term commitments to the State;	A
(ii)	Rely on economic linkages within the local economy;	A
(iii)	Diversify the economy;	A
(iv)	Reinvest in the local economy;	A
(v)	Are sensitive to community needs and priorities, and	A
(vi)	Demonstrate a commitment to provide management opportunities to Hawai'i residents.	A
(2)	Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements.	NA
(3)	Improve the quality, accessibility, and range of services provided by government to business, including data and reference services and assistance in complying with governmental regulations.	NA
(4)	Seek to ensure that state business tax and labor laws and administrative policies are equitable, rational, and predictable.	NA
(5)	Streamline the building and development permit and review process, and eliminate or consolidate other burdensome or duplicative governmental requirements imposed on business, where public health, safety and welfare would not be adversely affected.	C
(6)	Encourage the formation of cooperatives and other favorable	NA

	marketing or distribution arrangements at the regional or local level to assist Hawai‘i’s small-scale producers, manufacturers, and distributors.	
(7)	Continue to seek legislation to protect Hawai‘i from transportation interruptions between Hawai‘i and the continental United States.	NA
(8)	Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:	NA
(A)	An industry that can take advantage of Hawai‘i’s unique location and available physical and human resources.	NA
(B)	A clean industry that would have minimal adverse effects on Hawai‘i’s environment.	NA
(C)	An industry that is willing to hire and train Hawai‘i’s people to meet the industry's labor needs at all levels of employment.	NA
(D)	An industry that would provide reasonable income and steady employment.	NA
(9)	Support and encourage, through educational and technical assistance programs and other means, expanded opportunities for employee ownership and participation in Hawai‘i business.	NA
(10)	Enhance the quality of Hawai‘i’s labor force and develop and maintain career opportunities for Hawai‘i’s people through the following actions:	NA
(A)	Expand vocational training in diversified agriculture, aquaculture, information industry, and other areas where growth is desired and feasible.	NA
(B)	Encourage more effective career counseling and guidance in high schools and post-secondary institutions to inform students of present and future career opportunities.	NA
(C)	Allocate educational resources to career areas where high employment is expected and where growth of new industries is desired.	NA
(D)	Promote career opportunities in all industries for Hawai‘i’s people by encouraging firms doing business in the State to hire residents.	NA
(E)	Promote greater public and private sector cooperation in determining industrial training needs and in developing relevant curricula and on-the-job training opportunities.	NA
(F)	Provide retraining programs and other support services to assist entry of displaced workers into alternative employment.	NA
(b)	Priority guidelines to promote the economic health and quality of the visitor industry:	
(1)	Promote visitor satisfaction by fostering an environment which enhances the aloha spirit and minimizes inconveniences to	C

	Hawai‘i’s residents and visitors.	
(2)	Encourage the development and maintenance of well-designed, adequately serviced hotels and resort destination areas which are sensitive to neighboring communities and activities and which provide for adequate shoreline setbacks and beach access.	A
(3)	Support appropriate capital improvements to enhance the quality of existing resort destination areas and provide incentives to encourage investment in upgrading, repair, and maintenance of visitor facilities.	NA
(4)	Encourage visitor industry practices and activities which respect, preserve, and enhance Hawai‘i’s significant natural, scenic, historic, and cultural resources.	NA
(5)	Develop and maintain career opportunities in the visitor industry for Hawai‘i’s people, with emphasis on managerial positions.	C
(6)	Support and coordinate tourism promotion abroad to enhance Hawai‘i’s share of existing and potential visitor markets.	NA
(7)	Maintain and encourage a more favorable resort investment climate consistent with the objectives of this chapter.	NA
(8)	Support law enforcement activities that provide a safer environment for both visitors and residents alike.	C
(9)	Coordinate visitor industry activities and promotions to business visitors through the state network of advanced data communication techniques.	NA
(c)	Priority guidelines to promote the continued viability of the sugar and pineapple industries:	
(1)	Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.	C
(2)	Continue efforts to maintain federal support to provide stable sugar prices high enough to allow profitable operations in Hawai‘i.	NA
(3)	Support research and development, as appropriate, to improve the quality and production of sugar and pineapple crops.	NA
(d)	Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:	
(1)	Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.	C
(2)	Assist in providing adequate, reasonably priced water for agricultural activities.	NA
(3)	Encourage public and private investment to increase water supply and to improve transmission, storage, and irrigation facilities in support of diversified agriculture and aquaculture.	NA

(4)	Assist in the formation and operation of production and marketing associations and cooperatives to reduce production and marketing costs.	NA
(5)	Encourage and assist with the development of a waterborne and airborne freight and cargo system capable of meeting the needs of Hawaiʻi's agricultural community.	NA
(6)	Seek favorable freight rates for Hawaiʻi's agricultural products from interisland and overseas transportation operators.	NA
(7)	Encourage the development and expansion of agricultural and aquacultural activities which offer long-term economic growth potential and employment opportunities.	NA
(8)	Continue the development of agricultural parks and other programs to assist small independent farmers in securing agricultural lands and loans.	NA
(9)	Require agricultural uses in agricultural subdivisions and closely monitor the uses in these subdivisions.	NA
(10)	Support the continuation of land currently in use for diversified agriculture.	A
(e)	Priority guidelines for water use and development:	
(1)	Maintain and improve water conservation programs to reduce the overall water consumption rate.	A
(2)	Encourage the improvement of irrigation technology and promote the use of nonpotable water for agricultural and landscaping purposes.	NA
(3)	Increase the support for research and development of economically feasible alternative water sources.	NA
(4)	Explore alternative funding sources and approaches to support future water development programs and water system improvements.	NA
(f)	Priority guidelines for energy use and development:	
(1)	Encourage the development, demonstration, and commercialization of renewable energy sources.	C
(2)	Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.	C
(3)	Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.	C
(4)	Encourage the development and use of energy conserving and cost-efficient transportation systems.	C
(g)	Priority guidelines to promote the development of the information industry:	
(1)	Establish an information network that will serve as the catalyst for establishing a viable information industry in Hawaiʻi.	C
(2)	Encourage the development of services such as financial data processing, products and services exchange, foreign language	NA

	translations, telemarketing, teleconferencing, a twenty-four-hour international stock exchange, international banking, and a Pacific Rim management center.	
(3)	Encourage the development of small businesses in the information field such as software development, the development of new information systems and peripherals, data conversion and data entry services, and home or cottage services such as computer programming, secretarial, and accounting services.	NA
(4)	Encourage the development or expansion of educational and training opportunities for residents in the information and telecommunications fields.	NA
(5)	Encourage research activities, including legal research in the information and telecommunications fields.	NA
(6)	Support promotional activities to market Hawaiʻi's information industry services.	NA
226-104	POPULATION GROWTH AND LAND RESOURCES PRIORITY GUIDELINES.	
(a)	Priority guidelines to effect desired statewide growth and distribution:	
(1)	Encourage planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawaiʻi's people.	A
(2)	Manage a growth rate for Hawaiʻi's economy that will parallel future employment needs for Hawaiʻi's people.	A
(3)	Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.	A
(4)	Encourage major state and federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.	NA
(5)	Explore the possibility of making available urban land, low-interest loans, and housing subsidies to encourage the provision of housing to support selective economic and population growth on the neighbor islands.	NA
(6)	Seek federal funds and other funding sources outside the State for research, program development, and training to provide future employment opportunities on the neighbor islands.	NA
(7)	Support the development of high technology parks on the neighbor islands.	NA
(b)	Priority guidelines for regional growth distribution and land resource utilization:	
(1)	Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be	A

	provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.	
(2)	Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.	NA
(3)	Restrict development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area.	NA
(4)	Encourage restriction of new urban development in areas where water is insufficient from any source for both agricultural and domestic use.	C
(5)	In order to preserve green belts, give priority to state capital-improvement funds which encourage location of urban development within existing urban areas except where compelling public interest dictates development of a noncontiguous new urban core.	A
(6)	Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces.	A
(7)	Pursue rehabilitation of appropriate urban areas.	A
(8)	Support the redevelopment of Kakaako into a viable residential, industrial, and commercial community.	A
(9)	Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.	A
(10)	Identify critical environmental areas in Hawaiʻi to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.	C
(11)	Identify all areas where priority should be given to preserving rural character and lifestyle.	NA
(12)	Utilize Hawaiʻi's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.	A
(13)	Protect and enhance Hawaiʻi's shoreline, open spaces, and scenic resources.	A
226-	CRIME AND CRIMINAL JUSTICE. PRIORITY GUIDELINES IN	

105	THE AREA OF CRIME AND CRIMINAL JUSTICE:	
(1)	Support law enforcement activities and other criminal justice efforts that are directed to provide a safer environment.	NA
(2)	Target state and local resources on efforts to reduce the incidence of violent crime and on programs relating to the apprehension and prosecution of repeat offenders.	NA
(3)	Support community and neighborhood program initiatives that enable residents to assist law enforcement agencies in preventing criminal activities.	NA
(4)	Reduce overcrowding or substandard conditions in correctional facilities through a comprehensive approach among all criminal justice agencies which may include sentencing law revisions and use of alternative sanctions other than incarceration for persons who pose no danger to their community.	NA
(5)	Provide a range of appropriate sanctions for juvenile offenders, including community-based programs and other alternative sanctions.	NA
(6)	Increase public and private efforts to assist witnesses and victims of crimes and to minimize the costs of victimization.	NA
226-106	AFFORDABLE HOUSING. PRIORITY GUIDELINES FOR THE PROVISION OF AFFORDABLE HOUSING:	
(1)	Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low-and moderate-income and gap-group households.	A
(2)	Encourage the use of alternative construction and development methods as a means of reducing production costs.	A
(3)	Improve information and analysis relative to land availability and suitability for housing.	A
(4)	Create incentives for development which would increase home ownership and rental opportunities for Hawaiʻi's low- and moderate-income households, gap-group households, and residents with special needs.	A
(5)	Encourage continued support for government or private housing programs that provide low interest mortgages to Hawaiʻi's people for the purchase of initial owner-occupied housing.	A
(6)	Encourage public and private sector cooperation in the development of rental housing alternatives.	A
(7)	Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.	A
(8)	Give higher priority to the provision of quality housing that is affordable for Hawaiʻi's residents and less priority to	A

	development of housing intended primarily for individuals outside of Hawaiʻi.	
226-107	QUALITY EDUCATION. PRIORITY GUIDELINES TO PROMOTE QUALITY EDUCATION:	
(1)	Pursue effective programs which reflect the varied district, school, and student needs to strengthen basic skills achievement;	NA
(2)	Continue emphasis on general education "core" requirements to provide common background to students and essential support to other university programs;	NA
(3)	Initiate efforts to improve the quality of education by improving the capabilities of the education work force;	NA
(4)	Promote increased opportunities for greater autonomy and flexibility of educational institutions in their decision-making responsibilities;	C
(5)	Increase and improve the use of information technology in education by the availability of telecommunications equipment for:	NA
(A)	The electronic exchange of information;	NA
(B)	Statewide electronic mail; and	NA
(C)	Access to the Internet.	NA
(6)	Encourage programs that increase the public's awareness and understanding of the impact of information technologies on our lives;	NA
(7)	Pursue the establishment of Hawaiʻi's public and private universities and colleges as research and training centers of the Pacific;	NA
(8)	Develop resources and programs for early childhood education;	NA
(9)	Explore alternatives for funding and delivery of educational services to improve the overall quality of education; and	NA
(10)	Strengthen and expand educational programs and services for students with special needs.	NA

Sustainability: In 2011, the Governor signed into law Act 181 amending Chapter 226 to add a new definition (Sustainability) and new priority guidelines and principles to promote sustainability. Following is a discussion of how the Proposed Action fulfills the intent of these amendments.

As set forth in Act 181, "Sustainability means achieving the following:

1. Respect of the culture, character, beauty, and history of the State's island communities;
2. Striking a balance between economic, social, community, and environmental priorities; and

3. Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

New Priority Guidelines:

(1) Encouraging balanced economic, social, community, and environmental priorities;
(2) Encouraging planning that respects and promotes living within the natural resources and limits of the State;
(3) Promoting a diversified and dynamic economy;
(4) Encouraging respect for the host culture;
(5) Promoting decisions based on meeting the needs of the present without compromising the needs of future generations;
(6) Considering the principles of the ahupua`a system; and
(7) Emphasizing that everyone, including individuals, families, communities, businesses, and government, has the responsibility for achieving a sustainable Hawaii.

Discussion: The Proposed Action is consistent with the intent of these new priority guidelines. By focusing development in an existing urban area and by redirecting population growth to an area specifically designated for that purpose, the HCDA is contributing to the overall sustainability of Hawaii's economy.

Climate Change Adaptation: In 2009, Act 20 created a Climate Change Task Force that was to identify adaptation actions for Hawaii. The Task Force was never funded or convened. It ceased to exist in 2011. Nevertheless, a series of stakeholder-driven workshops were held in conjunction with the *Ocean Resource Management Plan*, with funding support from the Army Corps of Engineers and the National Oceanic Atmospheric Administration, which resulted in *A Framework for Climate Change Adaptation in Hawaii* (ORMP, 2009). The framework suggests to:

1) Build a Climate Change Adaptation Team;

2) Develop and Adopt a Long-Term Vision;

3) Identify Planning Areas and Opportunities Relevant to Climate Change;

4) Scope Climate Change Impacts to Major Sectors;

5) Conduct a Vulnerability Assessment;

6) Conduct a Risk Assessment;

7) Prioritize Areas for Adaptation Planning;

8) Set Preparedness Goals;

9) Develop, Select, and Prioritize Preparedness Actions;

10) Implement Preparedness Plan; and

11) Monitor Progress and Update Plan as Appropriate (ORMP, 2009).

This provides the groundwork in determining key components of Hawaii's future climate change adaptation plan.

As a next step in creating overarching guidelines for adaptation in Hawaii, Act 286 was passed in the 2012 legislative session (Office of Planning, 2013). Act 286 aims to prioritize guidelines to prepare the State to address impacts of climate change. Act 286 is now codified as Section 226-109, HRS. Following are the guidelines and a discussion of how they relate to the Proposed Action.

1) Ensure that Hawaii's people are educated, informed, and aware of the impacts climate change may have on their communities;

2) Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies;

3) Invest in continued monitoring and research of Hawaii's climate and the impacts of climate change on the State;

4) Consider native Hawaiian traditional knowledge and practices in planning for the impacts of climate change;

5) Encourage the preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, forests, streams, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change;

6) Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;

7) Promote sector resilience in areas such as water, roads, airports, and public health, by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;

8) Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other non-governmental entities, including nonprofit entities;

9) Use management and implementation approaches that encourage the continual collection, evaluation, and integration of new information and strategies into new and existing practices, policies, and plans; and

10) Encourage planning and management of the natural and built environments that effectively integrate climate change policy (HRS 226-109).

These priority guidelines are now "part of the statewide planning system, which coordinate and guides all major state and county activities and implements Chapter 226. As a priority guideline, climate change must now be considered in state and county budgetary, land use and other decision-making processes" (ICAP, 2012). However, actions may differ from the adaptation guidelines, in some circumstances, without penalty (ICAP, 2012). In addition, because the guidelines are at a relatively high-level, there is broad space for interpretation of what constitutes, for example, "encourag[ing] planning and management of the natural and built environments that effectively integrate climate change policy." The word "encourage" is non-binding while reference to effectively integrating climate change policy is vague, given there is currently little actual policy other than the guidelines themselves. These guidelines nonetheless serve as a foundational framework for prioritizing adaptation planning activities in Hawaii as well as for incorporating future climate change policies. The Office of Planning is "currently working with various stakeholders, primarily through the *Ocean Resource Management Plan* program, to implement this policy" (Office of Planning, 2013).

5.2.3 Hawaii State Functional Plans

The Planning Act called for the creation of functional plans to set specific objectives, establish policies, and implement actions for a particular field of activity. These functional plans further identified those organizations responsible in carrying out the actions, the implementing timeframe, and the proposed budgets.

The following section describe the Proposed Action's relationship and compatibility to applicable State Functional Plans.

5.2.3.1 State Educational Functional Plan (1989)

Goals of the Plan: The State Educational Functional Plan reflects the State Department of Education's (DOE) strategy to address the goals, policies, and priority guidelines of the Planning Act and the goals of the Board of Education (BOE). The plan outlines actions to be taken by the DOE to improve the public school system and to attend to various societal needs and trends.

Conformance with the Goals of the Plan: The HCDA will work closely with the DOE to ensure that demand for additional classrooms generated by the Proposed Action will be addressed.

5.2.3.2 State Energy Functional Plan (1991)

Goals of the Plan: The State Energy Functional Plan sought to (1) support the commercialization of Hawai'i's alternative energy resources, (2) implement a wide range of energy conservation and efficiency technologies; (3) prepare for disruptions in the energy supply; and (4) reduce the State's dependence on imported fossil fuels, such as oil, for 90 percent of its total energy needs as opposed to 42 percent nationally.

The plan called for objectives and courses of action to lessen Hawai'i's dependence on imported fossil fuels. The objectives were to: (1) moderate the growth in energy demand through conservation and energy efficiency; (2) displace oil and fossil fuels through alternate and renewable energy sources; (3) promote energy education and legislation; (4) support and develop an integrated approach to energy development and management; (5) ensure the State's abilities to implement energy emergency actions immediately in the event of fuel supply disruptions, and ensure essential public services are maintained and provisions are made to alleviate economic and personal hardships that may arise.

Conformance with the Goals of the Plan: The Proposed Action will facilitate energy conservation efforts by providing residential opportunities near the region's largest employment centers (Downtown, Ala Moana Center, and Waikiki). The Proposed Action's emphasis on pedestrian, bike, and transit options will assist the effort to use a non-motorized vehicle alternative and reduce overall fossil fuel consumption. The use of energy efficient equipment in buildings will also contribute towards the effort as well. HCDA will comply with sustainability guidelines adopted by the State. The intent of these guidelines is to respond to Hawai'i's complex growth challenges by promoting sustainable practices, high performance energy efficient buildings, economically viable and environmentally mindful development, and by encouraging best practices in new development today.

The Proposed Action will perpetuate the policies already established in the Mauka Area Rules that projects will incorporate energy efficient design principles where feasible. Design elements may include the use of individual meters for the residential and commercial/retail uses to provide incentives for energy conservation, high efficiency motors, chillers, energy efficient ballasts for all fluorescent lamps, building design that maximizes indoor light without increasing indoor heat, use of insulation and double glazed windows and doors, and energy efficient metal halide lights for outdoor lighting. The highly respected and established programs like the US Green Building Council's LEED (Leadership in Energy and Environmental Design) Green Building Rating System and other similar industry standard best practice rating and measurements systems are also available as tools for implementing designs with minimal impact to the environment.

5.2.3.3 State Historic Preservation Functional Plan (1991)

Goals of the Plan: The State Historic Functional Plan identifies issues, policies, and implementing actions that seek to preserve and protect the unsurpassable beauty, history, and culture of the Hawaiian Islands. Hawaiʻi's natural scenic beauty, clean environment, and rich multi-cultural heritage (including historic/cultural sites) are reasons why so many people have made Hawaiʻi their home, and why so many visit the State.

Conformance with the Goals of the Plan: The Proposed Action is supportive of the Historic Preservation Functional Plan. At the time of redevelopment, individual property owners will be expected to conduct a supplemental archaeological inventory survey for the expressed purpose of identifying archaeological and cultural resources so that they can be avoided. The preparation of the Cultural Impact Assessment included in this EIS furthers the understanding of the region's valued cultural resources.

5.2.3.4 State Housing Functional Plan (1990)

Goals of the Plan: The 1990 State Housing Functional Plan identified a need to develop affordable housing throughout the State, and found that the housing needs of lower income households would not be adequately met in future residential developments. Obstacles identified to the development of affordable housing include (1) the lack of infrastructure, particularly on the neighbor islands; (2) the high cost of zoned land, high development costs, and the regulatory system particularly on O`ahu; (3) government policies that have created a shortage of urban land zoned for housing; (4) lack of government funds to develop rental housing; (5) building codes and subdivision standards that constrain innovative, cost-saving technologies; and (6) current labor wages. The Plan recommended increased densities in residential developments where feasible, smaller and basic units, funding for rental developments, and state subsidies.

Conformance with the Goals of the Plan: The Proposed Action will comply with the Reserved Housing plan already incorporated as part of the Mauka Area Plan and Rules. The design incentives included in the Proposed Action (density bonuses, increased building height, and reduced parking standards) are all intended to encourage the development of affordable housing by helping to lower building costs. Please refer to Chapter Four, Section 4.10.5 for a detailed discussion of HCDA's intentions regarding its Reserved Housing plan.

5.2.3.5 State Recreation Functional Plan (1991)

Goals of the Plan: The 1991 State Recreation Functional Plan focused on six issue areas: (1) ocean and shoreline recreation; (2) *mauka*, urban, and other recreation; (3) public access to the shoreline and upland recreation areas; (4) resource conservation and management, (5) management of recreation programs and facilities; and (6) wetlands protection and management.

Conformance with the Goals of the Plan: The Makai Area supplements the existing recreational facilities present in the Mauka Area with the Kaka`ako Waterfront Park, Kaka`ako Gateway Park, Kewalo Basin Park, and Ala Moana Beach Park. HCDA will be preparing a new recreation plan for the KCDD to ensure that the provisions of the State Recreational Functional Plan are implemented.

5.2.3.6 State Transportation Functional Plan (1991)

Goals of the Plan: The 1991 State Transportation Functional Plan sought to (1) construct facility and infrastructure improvements in support of Hawai'i's thriving economy and growing population base; (2) develop a transportation system balanced with an array of new alternatives; (3) implement Transportation Systems Management to maximize the use of existing facilities and systems; (4) foster innovation and use of new technology in transportation; (5) maximize joint efforts with the private sector; (6) pursue land use initiatives which help reduce travel demand; (7) encourage resident quality-of-life improvements through improved mobility opportunities and travel reduction.

Conformance with the Goals of the Plan: The goal of the Proposed Action to promote transportation alternatives in the District, including access to transit and improved pedestrian and bicycle access will contribute to a community where people can live, work, and play in close proximity to their residences, thereby reducing their dependence upon automobile travel. The mixed-use character of the Proposed Action in a high density setting allows complimentary land uses to be clustered together, further reducing the need for automotive travel. Implementation of a Complete Streets program in the District will greatly improve pedestrian activities and bicycling. The implementation of three fixed rail transit stations in the District will not only compliment existing bus service, but help to further reduce dependency upon the automobile.

5.2.4 State Ocean Resources Management Plan

The State Ocean Resources Management Plan (ORMP) was adopted by the State Department of Land and Natural Resources in 2006 to establish management goals and strategic actions pertaining to three broad areas of concern. Following is a review of how the Proposed Action relates to the ORMP.

Table 5-3: Compliance with the State Ocean Resources Management Plan

Management Goals and Strategic Actions	Supports	Conforms	Inconsistent	Not Applicable

Improve coastal water quality by reducing land-based sources of pollution.	S	C	I	NA
Reduce soil erosion from upland forest ecosystems and conservation lands.				x

Reduce pollutant loads from residential, agricultural, and commercial uses in priority watersheds.				x

Discussion: The KCDD is an urban area that includes no forest ecosystems, conservation lands, or priority watersheds.

Protect beaches, wetlands, and coastal communities from shoreline erosion and other coastal hazards.	**S**	**C**	**I**	**NA**
Develop and implement a comprehensive and integrated shoreline policy that addresses the impacts of chronic and episodic coastal hazards.		x		
Develop a Hawai`i beach and shoreline management plan with specific management measures to address coastal erosion and other hazards in priority coastal areas.				x
Encourage appropriate coastal-dependent development that reduces risks from coastal hazards and protects coastal and cultural resources.		x		

Discussion: The Proposed Action incorporates development restrictions imposed by the Federal Emergency Management Agency through its Flood Insurance Rate Map (FIRM) program. As the District's coastline is a hardened seawall with no beach resources present, no beach and shoreline management plan is required.

Management Goals and Strategic Actions	**Supports**	**Conforms**	**Inconsistent**	**Not Applicable**

Improve and ensure maintenance and appropriate use of environmental infrastructure.	**S**	**C**	**I**	**NA**
Repair leaking sewers in priority watersheds.				x
Reduce the number of individual wastewater disposal systems in the coastal environment.				x
Reduce unpermitted storm-water discharges to the sewers in priority watersheds.				x
Provide appropriate waste management infrastructure to support commercial and recreational marine facilities.	x			

Discussion: The District's existing wastewater collection system will be expanded if needed to accommodate increased density under the Proposed Action.

Improve coastal water quality by reducing marine sources of pollution.	**S**	**C**	**I**	**NA**
Minimize the introduction and spread of marine alien and invasive species into and throughout archipelagic waters.				x
Establish wastewater-discharge restricted zones and conditions for commercial vessels in archipelagic waters.				x

Discussion: As part of the KCDD, Kewalo Basin is an important asset to the community. The authority for vessel-related activities there rests with the Harbors Division of the State DOT.

Improve the health of coral reef resources for sustainable traditional, subsistence, recreational, and commercial uses.	**S**	**C**	**I**	**NA**
Strengthen and expand marine protected area management.				x
Develop ecosystem-based approaches for near-shore fisheries management.				x
Establish and institutionalize approaches for restoring, operating, and preserving ancient Hawaiian coastal fishponds for the benefit of coastal communities around the State.				x
Improve enforcement capacity and voluntary compliance with existing rules and regulations for ocean resource protection.				x

Discussion: Management of coastal resources makai of the Kaka`ako Waterfront Park seawall rests with the Aquatics Division of DLNR and the Harbor Division of DOT.

Management Goals and Strategic Actions	**Supports**	**Conforms**	**Inconsistent**	**Not Applicable**

Enhance public access and appropriate coastal-dependent uses of the shoreline.	**S**	**C**	**I**	**NA**
Enhance and restore existing public shoreline areas and scenic vistas.	x			
Establish new shoreline areas public and appropriate coastal-dependent uses.	x			

Discussion: The Proposed Action's emphasis on improving pedestrian and biking activities within the District will help to enhance public access to the shoreline.

Promote appropriate and responsible ocean recreation and tourism that provide culturally informed and environmentally sustainable uses for visitors and residents.	**S**	**C**	**I**	**NA**
Develop community-based frameworks and practices for identifying and mitigating ocean recreational use conflicts.				x
Develop responsible and sustainable ocean-based tourism.				x

Discussion: Achievement of this goal is beyond the scope of the Proposed Action.

Encourage cutting edge and appropriate ocean science and technology with safeguards for ocean resource protection.	**S**	**C**	**I**	**NA**
Promote alternative ocean energy sources.				x
Plan and develop sustainable commercial aquaculture in coastal				x

areas and ocean waters to diversify and expand Hawai`i's economy and provide locally produced sources of seafood.				
Expand ocean science and technology.				x

Discussion: Achievement of this goal is beyond the scope of the Proposed Action.

Apply integrated and place-based approaches to the management of natural and cultural resources.	**S**	**C**	**I**	**NA**
Develop integrated natural and cultural resources planning process and standardized tools.		x		
Build capacity for community participation in natural and cultural resources management.		x		

Discussion: HCDA is committed to the protection and preservation of archaeological and cultural resources in the District.

Management Goals and Strategic Actions	**Supports**	**Conforms**	**Inconsistent**	**Not Applicable**

Improve the existing legal, regulatory, and institutional framework for integrated natural resources management based on scientific data, traditional knowledge, and field experience.	**S**	**C**	**I**	**NA**
Establish a legislative and administrative reform agenda to improve management of natural resources.				x
Develop integrated information management systems for priority watersheds and coastal areas.				x
Document and share experiences and lessons learned in Hawai`i and globally to promote natural and cultural resource policy reforms and adoption.				x
Monitor and evaluate ORMP implementation.				x

Discussion: The implementation of this goal and its accompanying strategic actions lies with the State Department of Land and Natural Resources.

5.2.5 State of Hawaii Historic Preservation Act (Chapter 6E, HRS)

As set forth in Section 1 of Chapter 6E, HRS, "The Constitution of the State of Hawaii recognizes the value of conserving and developing the historic and cultural property within the State for the public good. The legislature declares that the historic and cultural heritage of the State is among its important assets and that the rapid social and economic developments of contemporary society threaten to destroy the remaining vestiges of this heritage. The legislature further declares that it is in the public interest to engage in a comprehensive program of historic preservation at all levels of government to promote the use and conservation of such property for the education, inspiration, pleasure, and enrichment of its citizens. The legislature

further declares that it shall be the public policy of this State to provide leadership in preserving, restoring, and maintaining historic and cultural property, to ensure the administration of such historic and cultural property in a spirit of stewardship and trusteeship for future generations, and to conduct activities, plans, and programs in a manner consistent with the preservation and enhancement of historic and cultural property."

The District includes several properties and/or land registered as a State or National historic site. Burials that have been previously identified and inadvertently discovered in the District have been respectfully cared for and disposition (preservation in place of relocation) has followed the Hawai'i State Burial Laws as contained in chapter 6E. A CIA was prepared pursuant to Act 50, 2000 Hawai'i Session Laws, as part of the current EIS process. The CIA and the community consultation process identified cultural resources within the District and the potential impacts of the Proposed Action on these valuable cultural and historic resources is disclosed in Chapter 4.

5.2.6 State of Hawaii Environmental Protection Act (Chapter 343 & 344, HRS)

Hawai`i's Environmental Protection Act establishes procedures by which environmental impacts resulting from a proposed action are disclosed. The rules governing the implementation of Chapter 343 are found in Section 11-200, HAR. HAR Section 11-200-12 establishes thirteen (13) significance criteria which agencies use in evaluating an action's impacts. Following is a discussion of how the Proposed Action relates to applicable significance criteria:

Pursuant to subparagraph 12, ...an action shall be determined to have a significant effect on the environment if it:

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;

Discussion: The Proposed Action will impact cultural resources in the region. However, these impacts will be mitigated through continued compliance with policies and procedures established pursuant to Chapter 6E, HRS, and implemented under the auspices of the SHPO and the O`ahu Burial Council. ***(see discussion in Chapter Four, Section 4.6)***

(2) Curtails the range of beneficial uses of the environment:

Discussion: The range of beneficial uses of the District's environment is guided by the HCDA, as implemented by the State Legislature which designated the District as a redevelopment area. The Proposed Action is consistent with the planned beneficial use of the area. The Proposed Action increases the range of beneficial uses for the environment by providing additional residential units in the District, with an emphasis on affordable units, and increased connectivity with surrounding

roads, infrastructure, services, and public facilities. ***(see discussion in Chapter Two)***

(3) Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders;

Discussion: The stated purpose of Chapter 344 is to establish a state policy which will encourage productive and enjoyable harmony between people and their environment, promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, and enrich the understanding of the ecological systems and natural resources important to the people of Hawai'i. The Proposed Action complies with the policies, goals and guidelines of Chapter 344. The project proposes to improve the integration of the District with the regional transportation network (including the fixed rail system) and infrastructure systems, and improve the quality of life for residents by providing affordable housing near employment centers.

(4) Substantially affects the economic or social welfare of the community or State;

Discussion: The Proposed Action will have a beneficial impact upon the economic and social welfare of surrounding communities, the region and the State. It will provide new residential opportunities and the provision of housing that is affordable to the community; both of which will directly benefit the residents of the region. ***(see discussion in Chapter Four, Section 4.10.13)***

(5) Substantially affects public health;

Discussion: The Proposed Action is anticipated to have negligible impact on public health. Infrastructure systems will be constructed to comply with applicable State, DOH, and County standards and regulations. ***(see discussion in Chapter Four, Sections 4.8 and 4.9)***

(6) Involves substantial secondary impacts such as population changes or effects on public facilities;

Discussion: The Proposed Action will have a significant impact on population, which, in turn, will have an impact upon public facilities. While it will necessitate an increase in some services, e.g. enrollment in public schools for the children of new residents and increased demand for recreational facilities, these increases are offset by the increased economic benefits that the Proposed Action will bring to the region in terms of new tax revenues. ***(see discussion in Chapter Four, Sections 4.10.2 and 4.10.12)***

(7) Involves a substantial degradation of environmental quality

Discussion: The Proposed Action will not result in a substantial degradation of environmental quality in the District or the region. It will result in a substantial increase in the quality of life for existing and future District residents through the provision of pedestrian and bicycle friendly streets and a decreased emphasis on automobile travel. ***(see discussion in Chapter Four, Section 4.7.10)***

(8) Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions;

Discussion: The Proposed Action will involve a commitment for larger actions by the State DOE and the City and County of Honolulu's Fire Department and Police Department in terms of providing new personnel and/or facilities to support the anticipated development. It will result in a beneficial cumulative effect in the form of increased tax revenues in the region to help offset this demand. The project's environmental impacts are mostly related to short-term construction impacts that can be mitigated through the implementation of Best Management Practices.

(9) Substantially affects a rare, threatened, or endangered species, or its habitat;

Discussion: No rare, threatened, or endangered plants or terrestrials animals or birds have been identified in the District. ***(see discussion in Chapter Four, Section 4.3)***

(10) Detrimentally affects air or water quality or ambient noise levels;

Discussion: As discussed in Chapter 4, ***Sections 4.2 and 4.9,***, the Proposed Action will have no significant adverse impact upon water or air quality.

(11) Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;

Discussion: The Proposed Action will be implemented in a manner that conforms to prevailing flood control regulations and requirements. While portions of the District are situated within a tsunami evacuation zone, emergency evacuations plans already in place will help to ensure that the community can respond appropriately in during emergencies. ***(see discussion in Chapter Four, Section 4.1.4)***

(12) Substantially affects scenic vistas and viewplanes identified in county or state plans or studies,

Discussion: The Proposed Action will affect scenic vistas and viewplanes between the mountains and the ocean through the provision of new towers built up to or exceeding the prevailing height limit. However, it will not impact identified view corridors. ***(see discussion in Chapter Four, Sections 4.12.2 and 4.12.6.2)***

(13) Requires substantial energy consumption.

Discussion: Energy consumption will be increased in relation to the Proposed Action. However, new development will employ energy saving strategies. ***(see discussion in Chapter Four, Section 4.11.15)***

5.3 County Plans, Policies, and Controls

5.3.1 Oahu General Plan

The General Plan for the City and County of Honolulu (referred to herein as the "O`ahu General Plan"), first enacted in 1977 and amended in 2002, is a statement of the long-range social, economic, environmental, and design objectives for the general welfare and prosperity of the people of O`ahu and a statement of broad policies that facilitate the attainment of those objectives. The General Plan identifies eleven areas of concern. Following is a discussion of those objectives and policies that are directly relevant to the Proposed Action.

Table 5-4: Objectives and Policies of the O`ahu General Plan

Housing Objective	Policy	
A		To provide decent housing for all the people of Oahu at prices they can afford.
	1	Develop programs and controls which will provide decent homes at the least possible cost.
	3	Encourage innovative residential development which will result in lower costs, added convenience and privacy, and the more efficient use of streets and utilities.
	5	Make full use of State and Federal programs that provide financial assistance for low- and moderate-income homebuyers.
	8	Encourage and participate in joint public- private development of low- and moderate- income housing.
	10	Promote the construction of affordable dwellings which take advantage of Oahu's year-round moderate climate.
	12	Encourage the production and maintenance of affordable rental housing.
	13	Encourage the provision of affordable housing designed for the elderly and the handicapped.
	14	Encourage equitable relationships between landowners and leaseholders, between landlords and tenants, and between condominium developers and owners.

Discussion: The Proposed Action represents the latest initiative by the HCDA to fulfill its mission to provide new affordable housing opportunities for the residents of O`ahu.

Housing Objective	Policy	
C		To provide the people of Oahu with a choice of living environments which are reasonably close to employment, recreation, and commercial centers and which are adequately served by public utilities.
	1	Encourage residential developments that offer a variety of homes to people of different income levels and to families of various sizes.
	2	Encourage the fair distribution of low- and moderate-income housing throughout the Island.
	3	Encourage residential development near employment centers.

Discussion: The Proposed Action will provide new residential opportunities, including affordable housing, in close proximity to major employment areas. The provision of transit-oriented development is consistent with the City and County of Honolulu's intent to improve the quality of life of its residents through the introduction of a fixed rail system.

Transportation & Utilities Objective	Policy	
A		To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, the elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel.
	5	Improve roads in existing communities to reduce congestion and eliminate unsafe conditions.
	9	Promote programs to reduce dependence on the use of automobiles.
	10	Discourage the inefficient use of the private automobile, especially in congested corridors and during peak-hours.
	11	Make public, and encourage private, improvements to major walkway systems.

Discussion: The Proposed Action specifically focuses on new urban design attributes that will help to reduce dependency upon automotive travel and enhance

the use of the fixed rail system and bus service in the District. Implementation of a Complete Streets program in the District will improve pedestrian and bicycle use and access.

Energy Objective	Policy	
C		To fully utilize proven alternative sources of energy.
	1	Encourage the use of commercially available solar energy systems in public facilities, institutions, residences, and business developments.
E		To establish a continuing energy information program.
	2	Foster the development of an energy conservation ethic among Oahu residents.

Discussion: It will be the ultimate decision of the future developer(s) of individual properties to determine the extent of energy saving initiatives that will be implemented during redevelopment of their property. However, HCDA is committed to requiring that all major development structures meet the LEED certification standards for new structures on all individual site development.

Physical Development & Urban Design Objective	Policy	
A		To coordinate changes in the physical environment of Oahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.
	2	Coordinate the location and timing of new development with the availability of adequate water supply, sewage treatment, drainage, transportation, and public safety facilities.
	3	Phase the construction of new developments so that they do not require more regional supporting services than are available.
	4	Require new developments to provide or pay the cost of all essential community services, including roads, utilities, schools, parks, and emergency facilities that are intended to directly serve the development.
	5	Provide for more compact development and intensive use of urban lands where compatible with the physical and social character of existing communities.
	6	Encourage the clustering of developments to reduce the cost of providing utilities and other public services.

Discussion: The HCDA is committed to ensuring that new development will not proceed unless supported by adequate infrastructure. New development proposals in the District are reviewed on a case-by-case basis to ensure that adequate infrastructure capacity exists before a project is permitted to proceed.

Physical Development & Urban Design Objective	Policy	
D		To maintain those development characteristics in the urban-fringe and rural areas which make them desirable places to live.
	4	Maintain rural areas as areas which are intended to provide environments supportive of lifestyle choices which are dependent on the availability of land suitable for small to moderate size agricultural pursuits, a relatively open and scenic setting, and/or a small town, country atmosphere consisting of communities which are small in size, very low density and low rise in character, and may contain a mixture of uses.

Discussion: The Proposed Action is specifically intended to help reduce development pressures on rural and urban fringe areas by increasing density in the Primary Urban Center, and specifically in the District that was intended for redevelopment over 30 years ago.

Physical Development & Urban Design Objective	Policy	
E		To create and maintain attractive, meaningful, and stimulating environments throughout Oahu.
	3	Encourage distinctive community identities for both new and existing districts and neighborhoods.
	4	Require the consideration of urban-design principles in all development projects.
	5	Require new developments in stable, established communities and rural areas to be compatible with the existing communities and areas.

	8	Preserve and maintain beneficial open space in urbanized areas.
	9	Design public structures to meet high aesthetic and functional standards and to complement the physical character of the communities they will serve.

Discussion: The existing neighborhoods of the KCDD will be improved and enhanced through the implementation of the Proposed Action.

Culture & Recreation Objective	Policy	
B		To protect Oahu's cultural, historic, architectural, and archaeological resources.
	2	Identify, and to the extent possible, preserve and restore buildings, sites, and areas of social, cultural, historic, architectural, and archaeological significance.
	3	Cooperate with the State and Federal governments in developing and implementing a comprehensive preservation program for social, cultural, historic, architectural, and archaeological resources.
	4	Promote the interpretive and educational use of cultural, historic, architectural, and archaeological sites, buildings, and artifacts.

Discussion: The HCDA's is committed to preserving and protecting historic and cultural resources.

Culture & Recreation Objective	Policy	
D		To provide a wide range of recreational facilities and services that are readily available to all residents of Oahu.
	1	Develop and maintain community-based parks to meet the needs of the different communities on Oahu.
	6	Provide convenient access to all beaches and inland recreation areas.
	9	Require all new developments to provide their residents with adequate recreation space.
	10	Encourage the private provision of recreation and leisure-time facilities and services.
	13	Encourage the safe use of Oahu's ocean environments.

Discussion: Implementation of the Proposed Action will result in improved access to the regional's recreational amenities.

5.3.2 General Plan Update Program

In 2011, the DPP initiated a General Plan Update program to solicit public input on possible revisions to the O`ahu General Plan. In 2012, the DPP released a public review draft of the proposed General Plan Update. Public review meetings continued into 2013.

Following is a summary of the Proposed Action's compliance with applicable revisions being proposed to the O`ahu General Plan as discussed in the 2012 General Plan Update - Public Review Draft (GPUPRD).

The GPUPRD adds new language promoting sustainability. The Proposed Action is consistent with and supportive of these amendments.

The GPUPRD emphasizes the need for economic diversification. The Proposed Action is consistent with and supportive of these amendments. While a major focus of the Proposed Action is to help provide new residential opportunities in the Primary Urban Center, the indirect and induced job growth resulting from the Proposed Action will contribute to growth in other sectors of the O`ahu economy

The GPUPRD recognizes expanded options for visitor accommodations, including community hotels and alternative lodging. The Proposed Action is consistent with and supportive of this provision. The Proposed Action includes provisions for a limited number of hotels in the District.

The GPUPRD updates policies on affordable housing. The Proposed Action is consistent with and supportive of this policy. HCDA is committed to the provision of new housing opportunities that will be affordable to residents of O`ahu.

The GPUPRD promotes mixed use and higher density development. The Proposed Action is supportive of this policy. By focusing increased density in Kaka`ako, development pressures will be relieved in rural and urban-fringe areas of O`ahu.

The GPUPRD emphasizes the creation of a multi-modal transportation system and improvements to existing transportation and utility systems. The Proposed Action is consistent with and supportive of these policies. The TOD orientation of the Proposed Action is the result of the fixed rail system providing three new stations in the District. The Proposed Action also includes a strong emphasis on improving pedestrian activity and bicycle use in the District.

5.3.3 Primary Urban Center Development Plan

Adopted in 2004, the Primary Urban Center Development Plan is one of eight development plans created to implement the goals and policies of the O`ahu General Plan. Its policies are used to shape the growth and development of the primary urban core of Honolulu, which includes Kaka`ako. Kaka`ako will absorb about 30 percent of the PUC's future residential and commercial growth. Although conformance with the PUCDP is not required, the Proposed Action and the Baseline Condition (pursuant to the Mauka Area Plan) are generally consistent with the vision of the PUCDP. Policy 3.1.2 of the PUCDP pertains to open space network and calls for the preservation of panoramic views of natural landmarks and the urban skyline. The full buildout of Kaka`ako under the Baseline Condition and the Proposed Action would result in the near obliteration of the Mauka view of the Ko`olau mountain range referred to by the PUCDP. The Proposed Action lessens this impact my introducing provisions to reduce the bulk and mass of tower structures and encouraging orientation of the longer face of buildings to a Mauka-Makai orientation. It also encourages the continued preservation of view corridors along major Mauka-Makai oriented streets.

5.3.4 Special Management Area

Enforcement of the federal Coastal Zone Management Act (CZM) of 1972 has been delegated to the State and enacted as HRS Chapter 205A, HRS. The CZM area encompasses the entire State including all marine waters seaward to the extent of the State's police power and management authority, including the 12-mile U.S. territorial sea and all archipelagic waters. A CZM Certificate of Consistency is required for federal applicants, federal permits, or federal activities.

5.3.4.1 Coastal Zone Management

The CZM Act is comprised of a number of objectives primarily related to (1) protecting and preserving the coastal zone; (2) improving the quality of coastal scenic and open space resources and ensuring that coastal dependent development such as harbors and ports, and coastal-related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and (3) encouraging research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Following is a summary of the project's conformance with the ten objectives of the coastal zone management program.

1A Provide coastal recreation opportunities accessible to the public.

Discussion: The Proposed Action is consistent with and supportive of the existing Mauka Area Plan's initiatives to increase public access to nearby coastal recreational areas of Kewalo Basin Park, Kaka`ako Waterfront Park, and Ala Moana Beach Park by improving pedestrian connections between the Mauka Area and these parks. By promoting the District wide implementation of a Complete Streets program, the existing and future residents of the District will enjoy improved access to coastal recreational opportunities.

2A Protect, preserve, and where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Discussion: This objective will be satisfied by the Proposed Action which will continue the protection of identified historic resources in the District, through preservation, rehabilitation, and restoration as applicable. Moreover, no action to alter or demolish these protected properties shall occur without prior approval by the DLNR for state resources and the National Park Service for national resources.

3A Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Discussion: The Proposed Action focuses development on specific properties within the Mauka Area, thereby preserving the open space character and scenic attributes of the Makai Area. Existing open spaces in the Mauka Area, such as the Mother Waldron Neighborhood Park, will be preserved and new open space areas will be created as part of the Ward Master Plan and the Kamehameha Schools Master Plan for respective properties in the District.

4A Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Discussion: As a mature urban area, the District's existing storm water drainage system is designed to protect nearshore areas from excessive storm water runoff and environmental degradation.

5A Provide public or private facilities and improvements important to the State's economy in suitable locations.

Discussion: Because the Proposed Action responds in part to the planned development of three new rail stations in the District, it is specifically intended to focus new development in proximity to the rail system, to the benefit of all residents of O`ahu.

6A Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Discussion: The Proposed Action is focused on the Mauka Area, which is situated outside of the tsunami inundation zone. In the event of a disaster, the NBC and McKinley High School have been designated as disaster relief sites. Both sites are located outside the floodplain and can accommodate a large number of persons as needed. In addition, new residential towers built to comply with contemporary building codes improve opportunities for vertical evacuations during public emergencies.

7 Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Discussion: The development process will utilize and implement existing laws and applications will be reviewed in a timely manner. All proposed developments will be subject to the HCDA review and approval process. Developers shall also obtain applicable permits and planning approvals required by other local, state, and in some instances, federal agencies.

8 Stimulate public awareness, education, and participation in coastal management.

Discussion: Through the preparation of the EIS, the HCDA hopes to stimulate public awareness about coastal management issues relevant to the District.

9 Protect beaches for public use and recreation.

Discussion: The Proposed Action concentrates new development in the Mauka Area, thereby protecting regional beaches for public use and recreation.

10 Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Discussion: The Proposed Action includes actions that will likely increase the use of marine and coastal resources, due to its associated population increases. The HCDA is committed to working with its sister agencies to ensure that the public is educated to the sensitivity of our valued coastal resources.

5.3.4.2 Special Management Area

The State CZM review authority has been, in turn, delegated to the counties through the Special Management Area (SMA) controls for development along the shoreline. In the late 1970s, each county delineated the SMA around its coastline, varying in interior depth from a few hundred feet to several miles inland from the coastline. Within the District, the SMA extends from the shoreline to Ala Moana Boulevard and is administered by the State Office of Planning. Following is a discussion of the relationship of the Proposed Action to the guidelines presented in Chapter 205A-26.

(*1) All development in the special management area shall be subject to reasonable terms and conditions set by the authority in order to ensure:*

(A) Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas, and natural reserves is provided to the extent consistent with sound conservation principles;

Discussion: The Proposed Action focuses development in the Mauka Area and facilitates improved pedestrian access to the Makai Area which includes the Kaka`ako Waterfront Park.

(B) Adequate and properly located public recreation areas and wildlife preserves are reserved;

Discussion: The Proposed Action is consistent with and supportive of the existing Mauka Area Plan's initiatives to increase public access to nearby coastal recreational areas of Kewalo Basin Park, Kaka`ako Waterfront Park, and Ala Moana Beach Park by improving pedestrian connections between the Mauka Area and these parks. By promoting the District wide implementation of a Complete Streets program, the existing and future residents of the District will enjoy improved access to coastal recreational opportunities.

(C) Provisions are made for solid and liquid waste treatment, disposition, and management which will minimize adverse effects upon special management area resources; and

Discussion: The District is served by an existing municipal wastewater collection and treatment system. Solid waste collection is conducted by the City and County of Honolulu. All new development will be reviewed prior to approval to determine the adequacy of the wastewater collection and treatment system.

(D) Alterations to existing land forms and vegetation, except crops, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimum danger of floods, wind damage, storm surge, landslides, erosion, siltation, or failure in the event of earthquake.

Discussion: Given the flat character of the existing topography, the Proposed Project will require no significant alteration to existing land forms. The proposed development will be constructed in compliance with all applicable building and developed regulations to minimize danger from floods, wind damage, storm surge, erosion, siltation, or failure from earthquakes. Given the existing topography, the potential for landslides on the property does not exist.

(2) No development shall be approved unless the authority has first found:

(A) That the development will not have any substantial adverse environmental or ecological effect, except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health, safety, or compelling public interests. Such adverse effects shall include, but not be limited to, the potential cumulative impact of individual developments, each one of which taken in itself might not have a substantial adverse effect, and the elimination of planning options;

Discussion: Based upon the findings of the EIS, the proposed project will not result in a substantial adverse environmental or ecological effect over the long term. While the Proposed Action will result in ecological impacts, these are not anticipated to be long-term significant adverse impacts because they are short-term impacts related to construction. Anticipated beneficial impacts include the provision of new affordable housing opportunities.

(B) That the development is consistent with the objectives, policies, and special management area guidelines of this chapter and any guidelines enacted by the legislature; and

Discussion: Based upon the findings of the EIS, the proposed project has been found to be consistent with the objectives, policies, and special management area guidelines.

(C) That the development is consistent with the county general plan and zoning. Such a finding of consistency does not preclude concurrent processing where a general plan or zoning amendment may also be required.

Discussion: The proposed project is consistent with the O`ahu General Plan, and the Primary Urban Center Development Plan. As a redevelopment district established by the State, Kaka`ako is exempt from the City's zoning requirements. The HCDA has established its own zoning classifications pursuant to the Mauka and Makai Area Plans.

(3) The authority shall seek to minimize, where reasonable:

(A) Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough or lagoon;

Discussion: No such activities are contemplated as part of the Proposed Action.

(B) Any development which would reduce the size of any beach or other area usable for public recreation;

Discussion: No such activities are contemplated as part of the Proposed Action.

(C) Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the special management areas and the mean high tide line where there is no beach;

Discussion: The Proposed Action will not impose any restriction upon public access to tidal and submerged lands, beaches, portions of rivers, or the mean high tide line.

(D) Any development which would substantially interfere with or detract from the line of sight toward the sea from the state highway nearest the coast; and

Discussion: The Proposed Action is not anticipated to substantively interfere or detract from the line of sight toward the sea from the Ala Moana Boulevard. The Proposed Action focuses development activity in the Mauka Area, which is mauka of Ala Moana Boulevard.

(E) Any development which would adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.

Discussion: No such activities are contemplated as part of the Proposed Action.

5.3.5 Complete Streets

In 2012, the City and County of Honolulu adopted Bill 26 (2012), adopting a Complete Streets policy to guide and direct more comprehensive and balanced planning, design, and construction of City transportation systems. As set forth in the ordinance, the City now encourages the development of transportation facilities or projects that are planned, designed, operated, and maintained to provide safe mobility for all users. The ordinance identifies the following objectives:

(1) Improve safety;
(2) Apply a context sensitive solution process that integrates community context and the surrounding environment, including land use;
(3) Protect and promote accessibility and mobility for all;
(4) Balance the needs an comfort of all modes and users;
(5) Encourage consistent use of national industry best practice guidelines to select complete street design elements;
(6) Improve energy efficiency in travel and mitigate vehicle emissions by providing non-motorized transportation options;
(7) Encourage opportunities for physical activity and recognize the health benefits of an active lifestyle;
(8) Recognize complete streets as a long term investment that can save money over time;

(9) Build partnerships with stakeholders and organizations statewide; and
(10) Incorporate trees and landscaping as integral components of complete streets.

The Proposed Action is supportive of the Complete Streets initiative. The HCDA intends to implement Complete Streets throughout the District.

Chapter Six:
Contextual Issues

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6.0 Contextual Issues

6.1 Contributing to the Regional and Island Economy

Assuming full build-out, each of the TOD Alternatives generates more population, fewer operational jobs (in the form of office jobs), but more cumulative construction employment in Kakaʻako than does the Future Baseline Condition.

TOD Alternative B is forecast to generate $496 million in overall sales, payments, and exchanges than build-out under the Future Baseline Condition. For TOD Alternative A, the total statewide economic impact is slightly less: $474 million. (Each alternative assumes up to three hotels, but Alternative B assumes a higher density hotel because of the height limit imposed by Act 61).

Full build-out under Alternative B would create or maintain about 960 more job-years of direct employment than would full build-out of the Future Baseline Condition – with multiplier effects, total job-years of employment reaches about 2,660. For Alternative A, comparable figures are about 1,075 and 2,680.

TOD Alternative B is forecast to generate over $21 million annually in State taxes and about $1.5 million annually in County General Excise Taxes. Tourist Accommodation Taxes would exceed $67 million annually.

TOD Alternative A is forecast to generate over $22 million annually in State taxes and about $1.6 million annually in County General Excise Taxes. Tourist Accommodation Taxes would exceed $66 million annually.

Analysis of government costs and revenues is complicated by various uncertainties (such as whether public funds will be needed for parks, or whether new impact fees or other mechanisms to capture revenue from developers/consumers will be developed). However, the analysis suggests the State will see a significant annual positive balance from operational elements of each TOD Alternative, A or B. Given some conservative assumptions, the State's balance from facility and infrastructure construction costs alone could be negative, but the positive operational balance and tax revenues from build-out would be enough to offset this loss in a single year.

The City and County situation is more neutral – figures mostly hovering a little above zero for both construction costs and operational revenues, though a little negative for operations under TOD Alternative A only. That apparent negative balance is very small, and would be turned to a small positive balance if the State decides to restore more Transient Accommodations Tax funds to counties in the future. It would seem logical to assume that new development in Kaka`ako would result in a noticeable increase in property tax revenues. However, as discussed in Appendix G (the socio-economic impact analysis), real property tax revenues were

calculated on an islandwide basis, and it is assumed that growth in Kaka`ako represents captured growth that would otherwise occur elsewhere. Thus, net growth is nearly neutral.

Implementing TOD Alternative B would result in a Total Facilities Cost of approximately $1.88 million, while implementing TOD Alternative A would result in a modestly higher cost: approximately $1.96 million.

6.2 Relationship to Short-Term Uses and Long-Term Productivity

6.2.1 Trade Offs: Short-Term and Long-Term Gains and Losses

From an over-arching perspective, the benefits of providing more residential units, including Reserved Housing units, in the District generally outweigh the short-term impacts related to the construction of individual projects. The public investment in facilities and services that may be needed to support private sector development is greatly offset by increased tax revenues generated from completed projects.

As an incentive based plan, implementation of the TOD Overlay will depend upon voluntary actions and commitments by public agencies as well as private landowners. From the government perspective, the implementation of rules to guide transit-oriented development will have generally few, if any, short-term impacts; landowners need only comply if they seek the advantages offered in the form of incentives. The long-term impacts of implementing TOD will include increased density in the form of more residential units than allowed under the existing rules, and increased building heights for a limited number of towers (under Alternative A), which will result in a change to the skyline when viewed from afar.

Implementation of TOD will also result in the creation of a comprehensive Complete Streets program in Kaka`ako that will result in long-term benefits with very few short-term impacts. While a limited amount of construction is necessary over the short term, in the form of changes to sidewalks and street widths, and the re-striping of traffic lanes to accommodate increased bicycle usage, the long-term benefits are anticipated to include a shift away from reliance upon automobiles by residents of the District and an increase in alternative forms of transportation.

Implementation of HCDA's vision for Transit Oriented Development in Kaka`ako will result in some short-term impacts in the form of the construction impacts of infrastructure projects. However, as discussed in Chapter Four, the implementation of regional plans by the City's Board of Water Supply and the Department of Environmental Services are independent of any actions by HCDA and may or may not proceed depending upon the respective agencies ultimate course of action.

From the perspective of private landowners, implementation of TOD will result in the same general short-term construction impacts, on a project-by-project basis, as would development of their property pursuant to the existing rules.

6.2.2 Extent to Which the Proposed Action Forecloses Future Options

Because TOD is an incentive based program, in and of itself it does not foreclose upon other development options; it is an overlay that is "added on" to existing rules that guide development in the District.

6.2.3 How the Proposed Action Narrows the Range of Beneficial Uses

Since the KCDD has been targeted for redevelopment for several decades, beneficial uses are defined as the desired outcome of implementing HCDA's policies and plans. Those beneficial uses focus on the provision of new residential opportunities in the District, including units that affordable as defined by federal guidelines. Rather than narrow the range of those beneficial uses, the Proposed Action increases them by offering the opportunity for high density for residential development. It does, however, reduce to a small degree, commercial land uses in the District, compared to what is allowable under the current rules. However, that loss is considered to be negligible.

6.2.4 Long Term Risks to Health and Safety

Since there are no significant adverse impacts associated with noise or air quality, and because the Proposed Action focuses on increasing transportation options for District residents, there are generally no long-term risks to health and safety associated with the Proposed Action. While increases in vehicular traffic are anticipated to result from implementing TOD, resulting in impacts to regional traffic patterns and volumes, the presence of the HART ***light metro rail*** system in Kaka`ako, together with implementation of a Complete Streets program, are intended to mitigate those impacts, primarily by offering area residents opportunities to increase their bicycling and pedestrian activities, which in turn, can lead to a healthier lifestyle.

6.2.5 Culturally Significant Consequences

As discussed in Chapter Four, implementation of the Proposed Action will result in potentially significant archaeological and cultural impacts whenever inadvertent find of human remains occurs. It will also potentially impact contemporary cultural activities that may be threatened with displacement as the result of redevelopment.

6.2.6 Environmentally Significant Consequences

As the KCDD is a mature urban area with no identified flora or faunal habitat of significance, its redevelopment under the Proposed Action will result in impacts no different than those anticipated with full build-out under the existing rules (the Future Baseline Condition). Infrastructure in the District has been constructed over the past several decades to accommodate redevelopment envisioned by the HCDA and the State Legislature. Although implementation of the TOD overlay plan may necessitate some additional infrastructure projects, they are not anticipated to result in significant adverse environmental consequences.

6.2.7 Potential Harm to the Environment

Assuming that Best Management Plans and Practices are followed and all permit-induced protocol are adhered to, no primary, secondary, or cumulative impacts to the natural environment are anticipated.

6.2.8 Promoting Sustainability

HCDA is committed to promoting sustainable practices in both construction activities and operational activities that would implement the Proposed Action. The Proposed Action will facilitate energy conservation efforts by providing residential opportunities near the region's largest employment centers (Downtown, Ala Moana Center, and Waikiki). The Proposed Action's emphasis on pedestrian, bike, and transit options will assist the effort to use a non-motorized transportation alternative and reduce overall fossil fuel consumption. The use of energy efficient equipment in buildings will also contribute towards the effort as well. HCDA will comply with sustainability guidelines adopted by the State. The intent of these guidelines is to respond to Hawai'i's complex growth challenges by promoting sustainable practices, high performance energy efficient buildings, economically viable and environmentally mindful development, and by encouraging best practices in new development today.

The Proposed Action will perpetuate the policies already established in the Mauka Area Rules that projects will incorporate energy efficient design principles where feasible. Design elements may include the use of individual meters for the residential and commercial/retail uses to provide incentives for energy conservation, high efficiency motors, chillers, energy efficient ballasts for all fluorescent lamps, building design that maximizes indoor light without increasing indoor heat, use of insulation and double glazed windows and doors, and energy efficient metal halide lights for outdoor lighting. The highly respected and established programs like the US Green Building Council's LEED (Leadership in Energy and Environmental Design) Green Building Rating System and other similar industry standard best practice rating and measurements systems are also available as tools for implementing designs with minimal impact to the environment.

6.3 Irreversible and Irretrievable Commitments of Resources

6.3.1 Unavoidable Impacts and Probable Adverse Effects

Implementation of the Proposed Action (either TOD Alternative) will impact the general character of the overall district by increasing urban density, increasing the resident population, and increasing vehicular and non-vehicular traffic in and outside of the District. ***Increases in vehicular traffic will result in slower vehicular travel times, especially during peak hour travel periods. Intersections operating at Level of Service F will impede the movement of vehicles, including the transport of goods and the provision of some vehicular-oriented services.*** Either Alternative will impact scenic vistas: the skyline of Kaka`ako will change with the addition of new residential towers. Implementation of TOD Alternative A would increase those visual impacts due to the presence of a maximum of three iconic towers that may approach 700 feet in height (although the final determination as to the height of any structures on the three designated properties will be the result of negotiations between the landowner and HCDA). Building heights will be limited to 418 feet TOD Alternative B, thus the visual impact of height would not be any different than what is allowed under the current Mauka Area Rules, except that there may be additional numbers of towers constructed under TOD Alternative B.

Under the Future Baseline Condition, the construction of a new mixed-use high-rise developments throughout the Mauka Area will degrade the existing Mauka view of the Ko`olau mountain range as seen from the Makai Area, as disclosed in the 2009 Supplemental EIS. Implementation of either TOD Alternative may result in additional high-rise towers being constructed, which would further degrade the view. In addition, new development will change the visual character of the streetscape at the eye-level of the pedestrian, both through changes in building mass and replacement of existing single story buildings with multi-story buildings.

Whether these impacts are deemed to be adverse is somewhat subjective. Those attracted to the urban environment and the benefits it has to offer in terms of convenience and lifestyle, may not consider increased building density to be an adverse effect. However, those who may be opposed to the general concept of population growth, might consider any density increase in Kaka`ako to result in an adverse effect. For the residents already living in the District, implementation of the Proposed Action might be considered to be adverse if they purchased their unit or property based upon an assumption that the urban design character of the District would never change. However, for those residents who purchased their unit or property under the assumption that redevelopment of the District would occur in a timely manner, the effects resulting from implementation of the Proposed Action may be viewed as beneficial rather than adverse.

While all public services and facilities will be impacted by population growth throughout urban Honolulu, responses from affected agencies suggest that impacts

of both TOD Alternatives A and B on Kakaʻako-area schools and recreational facilities could be significant. (Park/recreational impacts are considered an "Unresolved Issue" until HCDA completes a study of needs and master plan for the area.) An additional fire station is likely also needed under both Alternative A and Alternative B.

6.3.2 Use of Non-Renewable Resources

Implementation of the Proposed Action would result in the irreversible and irretrievable commitment of certain natural and fiscal resources. Major non-renewable resource commitments include individual project sites, the capital financing of the project, construction materials, labor, and energy required for the construction and long-term operation of projects. Impacts represented by the commitment of these resources must be weighed against the positive social-economic benefits that could be derived from any particular development project (or the Proposed Action as a whole at build-out), versus the consequences of either taking no action or pursuing another less beneficial use of the area.

When fully built out pursuant to the Proposed Action (either Alternative), the area will transform to a higher density mixed-use environment than that envisioned under the current Mauka Area Rules (the Future Baseline Condition). More residents, more pedestrians, more bicycles, and more vehicles on the road can all be expected.

As with any construction activity, non-renewable resources such as fossil fuel and construction materials will be irrevocably committed. Labor will be required for planning, engineering, and construction. New residential, commercial, and light-industrial uses will generate increases in demand for water, electricity, and sewer services, and the provision of these services will create additional demand for the consumption of non-renewable resources. Similar types of development proposed elsewhere in Honolulu will generate the same or similar demand for these resources.

Providing potable water for consumption and irrigation would commit additional groundwater resources. However, it is repeated here that the population increase associated with the Proposed Action is anticipated to represent the relocation of existing population from elsewhere on the island. Thus, the anticipated increase in demand for non-renewable resources such as water in Kaka`ako also represents the relocation or redistribution of demand rather than the creation of substantive new demand.

The introduction of light rail to the District, together with the implementation of a Complete Streets program, will result in increased opportunities for existing and future residents to engage in transportation methods that are less reliant upon fossil fuels than internal combustion engine powered vehicles. In this regard, the Proposed Action will likely result in the decreased use of non-renewable resources.

However, because Kaka`ako is dependent upon the provision of electrical energy from a publicly regulated utility that presently relies upon non-renewable resources as the primary fuel source for its power plants, the District, together with its residents and the remaining population of the City and County of Honolulu, will continue to rely upon the use of non-renewable resources until such time that alternative energy sources are implemented by the utility. While that conversion is happening, progress has been slow.

6.3.3 Possibility of Environmental Accidents

Activities in the District pursuant to the Proposed Action will be limited to residential, commercial (including hotel and office), and light-industrial land uses. The possibility of significant environmental accidents emanating from residential and/or commercial land uses is quite remote, and is generally limited to the accidental spillage of small quantities of household chemicals or pesticides associated with landscape maintenance. Environmental accidents associated with light-industrial land uses are greater, due to the character of the land use, but are generally limited to similar small-scale accidental releases.

6.3.4 Loss and/or Destruction of Natural and Cultural Resources

Redevelopment of individual properties in Kaka`ako will result in the temporary loss of limited areas of existing vegetation and the faunal habitat associated with them. However, redevelopment also provides the opportunity for replacement of existing vegetation with new landscaping and vegetation. Provisions for the creation of new open space areas may result in a net gain of vegetated areas. Urban fauna displaced by development is considered to be resilient and will not likely be permanently lost. Implementation of the Proposed Action will result in potentially significant archaeological and cultural impacts whenever inadvertent find of human remains occurs. It will also potentially impact contemporary cultural activities that may be threatened with displacement as the result of redevelopment. However, it is not anticipated that these resources will be permanently lost or destroyed. Archaeological or historical cultural resources may be preserved in place or relocated, depending upon the nature of the resource, and decision-making by regulating agencies such as the State Historic Preservation Division of DLNR, which has strict regulations and protocol in place. Contemporary cultural activities may be displaced, but will likely not be destroyed as the result of redevelopment. Like any business, contemporary cultural activities respond to consumer demand, and if displaced, will likely relocate elsewhere in response to that demand.

6.3.5 Addressing the Irretrievable and Irreversible Loss of Resources

The irretrievable and irreversible loss of the resources discussed above is offset by the beneficial impacts associated with providing transit-oriented development in an existing urban area already targeted for redevelopment. Increasing urban density in a portion of the Primary Urban Center as a means of redirecting population growth

and expansion away from rural areas more than offsets the losses described. They would be far greater if the scale of population growth envision under the Proposed Action were to occur in a rural area.

6.4 Government Policies that Offset Identified Adverse Impacts

The following positive benefits included in the current TOD planning effort will help to offset the adverse impacts identified above by:

- increasing opportunities for the provision of Reserved Housing;
- increasing open space through urban design requirements focused on improving the streetscape and the pedestrian experience;
- improving pedestrian and bicycle access through the implementation of a Complete Streets program;
- reducing reliance upon internal combustion engine powered vehicles;
- increasing employment opportunities, including new service, retain, office and construction jobs;
- reducing urban pressure on rural areas elsewhere on O`ahu; and
- improving quality of living, working, and playing in urban Honolulu.

6.5 Secondary and Cumulative Impacts

Introducing transit-oriented development as an overlay to the redevelopment of Kaka`ako already anticipated under the current Mauka Area rules (the Future Baseline Condition), is likely to affect the residents and visitors to nearby areas such as downtown Honolulu, the Ala Moana/Sheridan district, Waikiki, and other areas of the City and County of Honolulu. Implementation of TOD, when added to other adopted and proposed projects of a similar nature (such as other TOD projects envisioned by the City along the transit line corridor), may have a significant ~~affect~~ ***effect*** on a regional scale, and at an islandwide scale.

Long-term direct effects will likely include increases in population-related activities including the increased presence of people, both residents and visitors, and improved economic conditions resulting of their demand for goods and services. Long-term indirect effects can extend to the redistribution of goods and services to accommodate the redistribution of population anticipated by TOD.

Kaka`ako is situated in the Primary Urban Center, which has been designated to accommodate a substantial portion of O`ahu's population growth over the next 25 to 30 years. The Proposed Action will have long-term effects on the decisions by O`ahu residents about where to live, work, and play, which will, in turn lead to a redistribution of population.

Implementation of the Proposed Action will also provide new employment, residential, commercial, and light-industrial opportunities that together sustain the redevelopment activity that was initiated by the implementation of the Mauka Area Plan in 2011.

6.6 Unresolved Issues

Regional Infrastructure: The construction of a region-serving sewer line to relieve wastewater demands in Waikiki and elsewhere in Honolulu is presently being evaluated by the City's Environmental Services Department. The decision to construct the line, and if so where, will impact wastewater collection line capacities in Kaka`ako. Some existing sewer lines in Kaka`ako are surcharged by wastewater generated elsewhere. Construction of the relief sewer line would resolve capacity issues and might preclude the need for additional smaller-scale sewer improvements in the District. The relief sewer line project has been under consideration for several years and the outcome of decision-making is beyond the control of HCDA. The matter will remain unresolved until the City completes its planning efforts, and the timing of that effort remains unknown.

City's 2040 Population Projections: The City and County of Honolulu's Department of Planning and Permitting periodically forecasts population on the island of O`ahu for purposes of long-range planning. For the past several years, DPP has utilized population projections with a planning horizon of 2035. The Proposed Action assumes the same planning horizon as its hypothetical build-out date. In 2013, the City advised HCDA that it would soon begin updating its current population forecast to 2040. As recently as October, 2014, in a follow-up inquiry to the City as to the status of its efforts, we were advised that the City has developed *interim* projections to 2040 that have been used by the City for some planning purposes. However, we were also advised that *official* projections are still on hold due to technical issues that must be resolved. The City is targeting June 2015 as a possible release date for the *official* projections. The matter will remain unresolved until such time that the DPP officially releases the 2040 forecast.

The Ultimate Timing and Extent of Community Amenities: As the majority of property in the KCDD is privately owned, individual properties will undergo redevelopment based on the preferences and needs of the respective property owners. The existing Mauka Area Rules define the maximum allowable scope of redevelopment of any particular property. While the TOD Overlay Plan, when implemented, will change that scope, it is an incentive based program and it will remain up to the property owner to determine how much density to pursue should they determine that redevelopment is in their interest. Thus, the scope of potential community amenities are tethered to the land use capacity of a particular property, as defined by the property owner in a redevelopment proposal. For example,

Kamehameha Schools has elected to focus the redevelopment of some of its properties at a density (including building height) that is less than what is allowed under existing rules. The ultimate timing of redevelopment of any given property is therefore unknown to the HCDA until the property owner presents specific plans to the agency for approval. Additionally, the extent of community amenities that may arise from the redevelopment of any particular property will ultimately be negotiated between the property owner and the agency and will be directly proportional to the density of the redevelopment proposed: the pursuit of maximum allowable density by a property owner will likely result in greater public amenities than a more modest development proposal. Thus, the ultimate provision of community amenities is unknown until such time that a property's redevelopment plan is formulated, presented to HCDA for review and approval, and the nature and extent of community amenities are successfully negotiated.

Office of Hawaiian Affairs (OHA) Master Plan: In 2014, OHA announced that it would prepare a master plan to determine the future uses and development timing for its property holdings in the Makai Area. The outcome of its master planning efforts will have broad implications on matters concerning general urban density, infrastructure capacity, and views. The scope and timing of the OHA master plan will remain unresolved until such time that the agency establishes a deadline for the planning effort and its decision-making.

Completion of HCDA Parks Master Plan: HCDA has determined the need to prepare a master plan for the provision of public and private parklands and recreational and/or passive open space in the KCDD. The timing for the preparation, review, and approval of the plan is presently unresolved. The outcome of this process cannot be known until the effort is funded by HCDA, a consultant is selected, and a deadline for completion is established.

Implementation of the Proposed Action: The Proposed Action is described throughout this document as being "incentive based", meaning that to achieve the HCDA's desired outcome of more affordable housing, pedestrian-friendlier streets, and less emphasis on the automobile, developers will be offered an incentive of greater density and/or relaxed parking standards, etc. How this incentive based program will be implemented is unresolved at this point in time. The process for implementing TOD requires the publication of a Draft TOD Overlay Plan, which was done in May 2013, followed by the preparation of an EIS to evaluate its impacts (which is now underway). Once the EIS effort is concluded, the Draft TOD Overlay Plan must be finalized and then approved by the HCDA. After that occurs, final rules for implementing TOD must be prepared by the HCDA and presented to the public for comment, before being reviewed by the HCDA for final approval. The rules are the mechanism by which the incentive based program will be implemented. The exact form and content of those rules cannot be finalized at this point in time, which leaves the matter unresolved. The matter will be resolved once the rules are finalized, presented to the public for comment, and ultimately reviewed by the HCDA for approval. However, Appendix B of the Draft TOD Overlay Plan (presented

in the EIS as Appendix A) presents a preliminary idea of the scope and content of the proposed rules for TOD.

Chapter Seven:
Document Preparation and References

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Chapter Eight:
Document Preparation and References

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8.0 Public Outreach

8.1 EIS Preparation Notice Publication, Comments, and Responses

An Environmental Impact Statement Preparation Notice was published in the December 23, 2012 edition of the Office of Environmental Quality Control's *Environmental Notice* announcing the intent of the HCDA to prepare an EIS for the Proposed Action. Written comments were received from the following:

- Outdoor Circle
- University of Hawaii's Water Resources Research Center and Environmental Center
- Kamehameha Schools[1]
- The Pacific Resource Partnership

The Draft TOD Overlay Pan was published on May 20, 2013. Comments on the Plan were received from the following:

- Servco Pacific Inc.
- CCH Department of Planning and Permitting

The comment letters on the EISPN, together with HCDA's responses, are presented following Section 8.3. The two letters commenting on the Draft TOD Overlay Plan follow the EISPN comments and responses.

8.2 Community Outreach

Since the inception of the TOD Overlay Plan project, the HCDA has sought to engage public agencies, elected officials, community members, organizations, and decision-makers in the discussion of the future of Kaka`ako as it relates to transit-oriented development. This process involved meetings with the following:

<u>City and County of Honolulu</u>

Board of Water Supply
Department of Design and Construction
Department of Emergency Services, Emergency Medical Services Division
Department of Environmental Services
Department of Planning and Permitting
Department of Transportation Services

[1] Two comment letters were received from Kamehameha Schools; dated 1-17-13 and 1-22-13.

Department of Parks and Recreation
Honolulu Administration for Rapid Transit
Honolulu Fire Department
Honolulu Police Department

State of Hawai`i

Department of Business, Economic Development & Tourism
Department of Education
Department of Land & Natural Resources, Division of State Parks
Department of Transportation
State Health Planning & Development Agency
State Historic Preservation Division
University of Hawaiʻi, John A. Burns School of Medicine

Federal Government

Federal Aviation Administration

Community Organizations

Hawaiʻi Hotel & Lodging Association
The Healthcare Association of Hawaiʻi (HAH)
Honolulu Board of Realtors
Kaka`ako Small Business Association

In addition, the HCDA conducted a series of four public informational Open House meetings at its office to present the Draft TOD Plan to the general public (May 23, 24, 25, and 30, 2013). Notice of the meetings dates and times were published in the Honolulu Star Advertiser the week prior to the meetings. Over 230 persons attended the meetings and were invited to provide comments on the Plan and the process.

The following persons attended the meetings (based on sign-up sheets posted at the meetings[2]). Handwritten comments received at the meetings have been transcribed and appear immediately following the list of attendees.

[2] All sign up sheets were handwritten and therefore the spelling of some names may be erroneous because the entry was difficult to read. We apologize for any errors.

May 2013 Open House Meeting Attendees:

May 23, 2013	May 23, 2013	May 24, 2013	May 25, 2013
Vince Vanderstroop	John G.	Roger Apana	Wayne Yoshioka
Mider Holloway	Paula Tadaki	Sumi Rilsaver	Pui Rhody
Al Lardizaba	Charles Barboza	Todd Murata	Ben Sadoski
Peter Lee	Debra Barboza	Garreth G.	Mel Sakurai
Roy Corauz	Luis B.	Cindy Chang	R. Wakin
Oz Stender	Will Beaton	Rick Beau	H. Kobayashi
Jack Hamada	Chris Delaunay	Adam Au	K. Faulkner
Brett MacLaughton	John Knox	Abbey Mayer	Sharon Venespas
Tom Smyth	Renee Ing	Mike Gushard	Edie Vajida
Dexter Okada	Amy Chen	Linsa Anzai	Duane Preble
Hannah Jurinka	Hina Chun	Linda Wong	Kay Fukuda
Toby Tamaye	Sandy Shitanishi	Ed Oshiro	Will Kim
Issac Smyth	John Neeley	John Lee	Tom Schnell
Caroline Kishida	Melody Calisay	Dexter Gomes	Lillian Chu
Jennifer Bryant	Lisa Eveleth	Didi Herron	Chris Ching
Charley Ice	Matthew Gonser	Sifa Tiuetei	L. Yamauchi
Leslie Miasule	Kenn Crockett	Cynthia Lee	Linda Sue
Karon Shimizu	Virginia Aycock	Theone V.	Eddie Johnson
Kirstin Punu	Ralph Burr	Angie Westfall	Tom Shirbida
Brad Punu	Clara Morikawa	L. S. Honda	Aliza Shirbida
Michael Kelly	Francis Morikawa	Kathy Nishimura	Simon Okawa
Liz Larson	B. Nunes	Bob Nakata	Carole Kaapu
Jeff Merz	Lynn Bailey	Aletta Ohau	Cindy Aylette
Will Carol	Takuo Ito	Tom Heinrich	John Ayleff
Brett Hill	Stanley Yoh	David Gulick	Donn Sakuda
Pat Lee	Lee Cranmer	Shannon Wood	Jeff Gaskell
Gerald Chun	Ron Iwami	Hannah Jurinka	Lowell Chun
Christine Kaneshiro	Barbie Pine	Reid Okumura	Pauline Chun
Rick Hayashi	Ryan Tam	Jim Brewer	Margaret Lyan
Tracy Kubota	Byrnes Yamashita	Thomas G.	Yasuko Nelson
Darin Mar	Betty Hurfid	Daniel Nakamani	Galen Fox
Aaron Landrey	Asia Yeary	Tony Ngai	Carol Star
Wayne Y. Yoshioka	Shanah Trevenna	Joe Magaldi	John Clements
Jan Wonso	Sean Connelly	Russell Lake	Rose Reed
Doran Chavez	Mike Leach	Kim Mooney	Mark K. Hata
Bruce Fujimoto	Anie Parkinson	George Atta	Sarah Preble
Sandra Kobayashi	Marti Townsend	Scott Sato	Buzz Carang
G. Saito	Jim Frierson	Cizette Sato	A. Kimura
Art Lei	Bob McKaig	Norman Sawai	Junko Sekiya
Mark C. Smith	Sonavie One		

May 25, 2013	May 30, 2013	May 30, 2013	May 30, 2013
Diane Liu	Edna Weeks	Dennis Henmy	Joanna Morrisato
Gans Yuan	Faith Rex	Ken Rappolt	Patricia Tanaka
Claude Goins	Carolyn Hong	June Ames	Ellen Corrie
Clara Morikawa	Bonnie Arakawa	Ed Chong	Ken Takahashi
Francis Morikawa	Yuki Chang	Seiji Ogawa	Jeff Warner
Calvin Lyau	Ed Feeley	Adam Woltag	Glenn Takeuchi
Grant Okawa	William Ammons	Paula Sarish	Ray Bumgardner
Kazuma Nakagawa	Michael Asato	Michael T. Afonso	Jana Wells
Kristin Nagakawa	Cliff Garcia	Gary Onishi	Jay Wilosz
	Sharon Schmuli	Ryan Char	Breene Harimoto
	Charles Cardel	Frank Genadio	Vincent Shigekuni
	Betty Wood	Robert Oda	Rick Lazar
	Carol Kage	Michael Kujubu	Doreen Harada
	Nina LaMonte	Daisy Murai	Stanford Carr
	Renee Espiau	Madigan W.	A. Akau
	Yuki Kawai	Richard Quinn	M. Reynolds
	Gerald Toymura	Ann Yamamoto	Charlie Z.
	Kika Bukoski	Branden Elefante	Rodney Funakoshi
	Malynne Simeon	Richard Regels	Virginia Low
	Bob Crone	Jeff Sandborn	Trina Dang
		Sidney Fukuyama	Mark Garrity
		Anthony Aballo	

The following comments (unedited and unabridged) were transcribed from public comments written on the display boards of the TOD Overlay Plan visual materials during HCDA's Open House conducted during May 23, 24, 25, 30, 2013. (Please note that persons commenting were not asked or required to provide their name.)

"Preserve views from Punchbowl to Magic Island and Ala Moana Park unobstructed."

"Schools – elementary/middle/high to keep residents within Kakaako."

"I like townhomes at ground level."

"Where are sports fields? Civic amenities?"

"Provide expansive plaza at stations with active uses adjacent to…"

"Improvements to H-1 (on/off ramps) – impact of roads beyond (Ward/Punchbowl) immediate/adjacent streets of high rises."
"Voyager its moved! To Reed Lane…"

"A park in a city can be a green desert. Where is the city square that will give a heart and life to this neighborhood?"

"To create pedestrian friendly district HCDA needs control of streets and areas currently controlled by City's right-of-way"

"If Blaisdell is removed, its replacement must include and enhance current available venues for the arts and entertainment. Kakaako cannot be turned into a cultural desert."

"Mature street trees."

"Urban programmed park space (basketball, tennis..) and community center."

"Where is the central square with stores and cafes and restaurants at street level…"

"Where are the new schools to support the new residential uses. What will they look like ie. A dense multi-story school or a typical 8 acre plan?"

"Why don't these illustrations show us what the Kamehameha Schools and Howard Hughes projects will do? How do they integrate with HCDA plans?"

"If this neighborhood is really for families and not a ghost town for offshore investors, where is the elementary school going to be? Why is the only existing school (DOE) property (former Pohukaina school site) being used for a state sponsored 670 foot tower rather than for a school for which it is ideally located?"

"How do small landowners (not KS/HH) redevelop? Cost of construction and design plans and TOD framework is impossible."

"What does Kakaako mean? Names have meanings, and can have an effect on the person, or the place."

"Public safety ie. A police sub-station should be a priority."

"This area has a long and varied history. A museum would show what this place was like, as a basis for its ongoing present and future."

"Why Turtle Bay and envision Laie if this is PUC plan!"

"The local taxpayers will support this with GET for rail, sewer assessments that are going out of sight as well as water fees."

"We better get almost all affordable rentals and not subsidize rich guys from outside Hawaii and big time developers!"

"Diamond Head is 400 feet – that's our iconic landmark that should set the city's…the 700 foot height limit damages the whole scale and quality of Kakaako's mauka makai special experience. It is the height and visual beauty of the Koolaus as seen from Honolulu's Kakaako core area that makes this on of the world's most exceptionally beautiful, desireable and livable places. It helps drive the visitor industry and make visitors want to buy in. As we accommodate more and more 'affordable housing' in this area with out-of-scale towers we promote population growth and simultaneously kill the sense of this place, the unique quality of the place and kill the goose. Don't destroy mauka/makai views!"

"I totally oppose proposed exemptions to heights allowed for new condos. I believe the density can be accomplished without higher buildings and creating concrete jungle. Don't make this another Waikiki with all its concrete."

"Why have height limitations if every time a developer wants to build a taller building he is granted a variance? I vote a big no on anymore buildings taller than the 400 foot limitation!"

"All views should be identified by street, neighborhood and city." (note: this comment was written in reference to photos displayed during HCDA's open house)

"Towering highrises will put many of these charming streets in shade."

"How do we keep open public spaces clean and free from homeless?"

"To achieve family friendly space Kakaako Makai must stay open space."

"Open space important but if there are no other uses that create presence, only open will not be as safe or secure as people may want." (note: this is in reference to the comment directly preceding)

"Without real and sufficient grocery and other retail you will only increase traffic."

"Times market or Whole Food?? Nearest is Foodland Ala Moana, would you carry y our groceries? Must not create food deserts."

"All of these desirable life issues are important and need to be accommodated."

"Be sure to do bike/car road education!"

"Where is the school?"

"Make sure there are benches and shade trees for the surfers, walkers, and families!"

"Great idea!" (note: comment in response to photo of community gardens below the rail guideway)

"Excellent!" (note: comment in response to suggestion that rail alignments can be activated with bicycle paths as done in Vancouver, BC)

"Why aren't the densities increased closer to the stops and then taper out?"

"The frameworks needs to truly consider the education assets (existing) potential…and lets not forget about employment (jobs!) impacts."

"We don't want this great opportunity to mix TOD with the need for rental housing people can afford – TOD should not be just for those who can afford affordable units. People with below median incomes need truly economical rental housing, and other locales are creatively building economy rentals that fill this need. Kakaako should make sure to do it also, since one-half of Hawaii's people have below median incomes."

"Rules need a specific provision requiring mandatory area for bike parking! Why doesn't HCDA have a rack in front of your office?"

"Don't forget bike garages at train stations."

"Will be interested to see a path analysis in the EIS analyzing walking routes between the transit stations and the major visit destinations. This will facilitate pedestrian protection measures and interfaces with vehicle ways."

"About 16 years ago I recall Mitch D'Olier (sp?) then head of Victoria Ward proposed closing Auahi Street at Ward Avenue to create a kind of mall at that intersection a parking structure was to be built. Is there a possibility that Auahi Street could still be closed to automobile traffic. Originally Victoria Ward owned Auahi Street."

"You should have those streets where everyone crosses at once like in Waikiki."

"TOD rules seem to trump the existing mauka area rules by allowing towers of 700 feet in height? If that is the case it is a bad precedent to set."
"How many degrees will the temperature rise? Will there be many reflective buildings? 10% temperature rise."

"Small footprint is a good idea but no variance on height."

"Keep FAR to city limits – 3.0 FAR max."

"How does parking structure in the center support 'transit-oriented' development?"

"Once rail is on-line parking structure should be designed so it can be replaced with living space."

"How have you solved the complexities involved with owning/developing shared parking structures?"

"Are you reducing code requirements for parking and unbundling the parking?"

"Consider low-rise density condos, such as Vanguard Lofts."

"Please limit building heights and protect views!"

"Make sure that infrastructure can support this density – streets, water, sewer, power. How will you manage the traffic?"

"Height limits please – this is Honolulu not Manhattan."

"Protect views of Diamond Head from the Ewa direction."

"Will there be any way to guarantee that increases in height for buildings in the urban core will mean no urban sprawl into ag lands elsewhere on Oahu? If not, there needs to be."

"Urban heat island studies?"

"How about more trees to climatize pedestrian areas?"

"How will the buildings affect the wind patterns?"

"Infrastructure – water, sewers – who builds it, who manages it, who pays for it."

"Public elementary and middle schools – where will they be and who will build them."
"Please retain the historic stone curbs that are along many Kakaako streets. When new developments come in do not allow them to replace the stone curbs with new concrete curbs. Also please do not widen streets. Keep the historic dimensions of Kakaako's streets. At the corner of Halekauwila and Keawe Streets the stone curbs have been removed and the street has been widened – this should no have happened."

"Kakaako – do it right plan wisely!"

"Please review and visit crystal city in Arlington. This sounds like their original vision which hasn't been as successful."

"Is it possible to stop even considering raising the height limits to 700 feet and keeping the limits as is. Kakaako already has an extra 50 feet in height, it shouldn't ask for more."

"Housing for families making $120,000 a year is hardly affordable half of us make under $90,000 total family income."

8.3 Draft EIS Distribution, Comments, and Responses

Copies of the Draft EIS ~~are being~~ ***were*** submitted to the following agencies, organizations for review, as required by the OEQC. ***Parties that responded are identified by an asterisk (*) following their name.*** The DEIS ~~will be~~ ***was*** provided in digital format (on a CD). The HCDA promotes a policy of reduced use of paper the HCDA and encourages the use of digital files. However, a limited number of printed copies ~~are~~ ***were*** available.

Federal Agencies
Department of the Interior, Geological Survey, Pacific Islands Water Science Center
Department of the Interior, Fish and Wildlife Service
Department of Commerce, National Marine Fisheries Service
Department of Interior, National Parks Service
Department of Agriculture, National Resources Conservation Service
Department of Transportation, Federal Aviation Administration*
Department of Transportation, Federal Transit Administration
Department of Homeland Security

State Agencies
Office of Environmental Quality Control*
Department of Agriculture
Department of Accounting and General Services
Department of Business, Economic Development and Tourism
DBEDT Research Division Library
DBEDT Strategic Industries Division
DBEDT Office of Planning
Department of Defense*
Department of Education
Department of Education, Hawaii State Library, Hawaii Documents Center

Kaimuki Regional Library
Kane`ohe Regional Library
Pearl City Regional Library
Hawaii Kai Regional Library
Hilo Regional Library
Kahului Regional Library
Lihu`e Regional Library
Department of Hawaiian Home Lands*
Department of Health, Environmental Health Administration*
Department of Land and Natural Resources*
DLNR – Historic Preservation Division
Department of Transportation*
Office of Hawaiian Affairs*
University of Hawaii Water Resources Research Center
University of Hawaii Environmental Center
University of Hawaii, Thomas H. Hamilton Library
University of Hawaii, Edwin H. Mo`okini Library
University of Hawaii, Maui College Library
University of Hawaii, Kaua`i Community College Library
University of Hawaii, West Oahu Library
Legislative Reference Bureau

State Elected Officials
United States Senator Mazie Hirono
United States Senator Brian Schatz
United States Representative Mark Takai
United States Representative Tulsi Gabbard
Governor David Ige
Lieutenant Governor Shan S. Tsutsui
Senator Brickwood Galuteria
Senator Donna Mercado Kim, Senate President
Representative Scott K. Sakai*
Representative Joe Souki, Speaker of the House
Representative Karl Rhodes

City and County of Honolulu
Department of Planning and Permitting*
Board of Water Supply
Department of Customer Services
Department of Design and Construction
Department of Environmental Services
Department of Facility Maintenance*
Department of Parks and Recreation
Department of Transportation Services*
Honolulu Authority for Rapid Transit*
Honolulu Fire Department*

Honolulu Police Department*

City and County of Honolulu Elected Officials
Council Chairman Ernest Martin
Council Member Carol Fukunaga
Chair, Ala Moana Kakaako Neighborhood Board #11
Chair, Downtown Neighborhood Board #13
Chair, Mo`ili`ili/McCully Neighborhood Board #8

News Media
Honolulu Star Advertiser
Hawai`i Tribune Herald
West Hawai`i Today
The Garden Isle
Maui News
Moloka`i Dispatch

Consulted Parties
Kamehameha Schools*
The Outdoor Circle
Pacific Resource Partnership
University of Hawaii Water Resources and Environmental Centers

Other Parties
Servco Pacific Inc.*
John A. Burns School of Medicine
University of Hawaii Cancer Center
Howard Hughes Corporation*
General Growth Properties

Following is a list of agencies, organizations and individuals who commented on the Draft EIS, presented in the order they were received. Their comments, together with HCDA's responses follow the EISPN comments and responses.

1. ***State of Hawaii, Department of Health, Environmental Planning Office***
2. ***United States, Department of Transportation, Federal Aviation Administration***
3. ***State of Hawaii, Department of Health, Wastewater Branch***
4. ***State of Hawaii, Department of Health, Clean Water Branch***
5. ***City & County of Honolulu, Police Department***
6. ***State of Hawaii, Department of Land and Natural Resources, Office of Conservation & Coastal Lands***
7. ***City & County of Honolulu, Fire Department***
8. ***City & County of Honolulu, Department of Transportation Services***
9. ***State of Hawaii, Department of Land and Natural Resources, Land Division***

10. ***State of Hawaii, Department of Transportation***
11. ***Howard Hughes Corporation***
12. ***Servco Pacific***
13. ***Honolulu Authority for Rapid Transportation***
14. ***Hawaii's Thousand Friends***
15. ***Councilmember Carol Fukunaga, Representative Tom Brower, Senator Suzanne Chun Oakland & Representative Scott Saiki***
16. ***Kaka`ako United***
17. ***Airlines Committee of Hawaii***
18. ***City and County of Honolulu, Department of Planning and Permitting***
19. ***City and County of Honolulu, Department of Facility Maintenance***
20. ***Office of Hawaiian Affairs***
21. ***State of Hawaii, Department of Health, Office of Environmental Quality Control***
22. ***State of Hawaii, Department of Defense***
23. ***State of Hawaii, Department of Hawaiian Home Lands***
24. ***Kamehameha Schools***

Written Comments on EISPN And Responses

15373

KAMEHAMEHA SCHOOLS

RECEIVED
2013 JAN 17 AM 10 11
HAWAII COMMUNITY
DEVELOPMENT
AUTHORITY

January 16, 2013

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Amy Mutart
Project Manager
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawai'i 96813
Phone: (808) 594-0334

SUBJECT: **Request by Kamehameha Schools to be a Consulted Party in the Preparation of the Environmental Impact Statement for the Transit-Oriented Development Overlay (the "Proposed Action")**

Dear Ms. Mutart:

Pursuant to the enclosed environmental notice for the Proposed Action and Hawaii Administrative Rules §§11-200-9 and -15, Kamehameha Schools requests to be a consulted party in the preparation of the Environmental Impact Statement for the Proposed Action. We understand that the Proposed Action is as set forth in the *"Kakaako-TOD Overlay and Complete Streets Plan"* attached hereto. Prior to January 22, 2013, Kamehameha Schools may provide comments to the Proposed Action.

Please advise me if any additional information is required to recognize Kamehameha School as a consulted party under the applicable agency rules. Thank you.

Sincerely,
Kamehameha Schools

Paul A. Quintiliani
Senior Director, Commercial Real Estate Division

Lee Sichter LLC
45024 Malulani Street #1, Kaneohe, Hawaii 96744
Ph. (808) 382-3836; Fax. (808) 234-0872; Web. www.leesichter.com

December 16, 2014

Mr. Paul A. Quintillani, Senior Director
Commercial Real Estate Division
Kamehameha Schools
567 South King Street,
Honolulu, Hawai`i 96813-3036

Dear Mr. Quintillani:

Response to Comments on Kaka`ako TOD Overlay Plan
Environmental Impact Statement Preparation Notice

Mahalo for your letter of January 16, 2013 providing comments on the EISPN for the TOD Overlay Plan.

We appreciate your interest in the project and your participation in the Chapter 343 environmental review process. As a Consulted Party, KS will be provided a copy of the Draft EIS when it becomes available for your review and comment. We anticipate publication of the Notice of Availability of the Draft EIS in January 2015.

Very truly yours,
LEE SICHTER LLC

Lee Sichter

The Pacific Resource
PARTNERSHIP

January 21, 2013

Amy Mutart, Project Manager
Hawaii Community Development Authority
461 Cooke Street
Honolulu, HI 96813

RE: Comments on Transit-Oriented Development Overlay for the Kakaako Community Development District Environmental Impact Statement Preparation Notice

Dear Ms. Mutart:

The Pacific Resource Partnership (PRP), a labor-management consortium representing over 280 signatory contractors and the Hawaii Regional Council of Carpenters, offers the following comments related to the Transit-Oriented Development (TOD) Overlay – Kakaako Community Development District Environmental Impact Statement Preparation Notice.

Using current City and County projections for population and job growth through the next several decades, we anticipate the need for about 104,500 additional homes to accommodate the city's resident population. PRP strongly favors exploring the impacts that focusing much of this projected development within Honolulu's urban corridor, specifically along the rail transit alignment, will have. We believe there will be substantial benefits to a well-managed growth strategy.

We would like the Environmental Impact Statement (EIS) to focus on the impacts of well-managed growth that is more walkable, less automobile-dependent, and more closely coordinated with transit investments. This could include TOD's effect on the following measurable factors:

- Green House Gas (CO2e) emissions from cars and buildings
- Air pollution and public health impacts
- Fuel use and cost
- Building energy and water use, and cost
- Land consumption
- Fiscal impacts: capital infrastructure costs, operations and maintenance costs, and local revenues

1100 Alakea Street • Alakea Corporate Tower, 4th Floor • Honolulu, HI 96813
Tel (808) 528-5557 • Fax (808) 528-0421 • www.prp-hawaii.com

We appreciate the opportunity to offer comments on the TOD Overlay for the Kakaako Community Development District EISPN.

Aloha,

John White, Executive Director

cc: Lee Sichter LLC

1100 Alakea Street • Alakea Corporate Tower, 4th Floor • Honolulu, HI 96813
Tel (808) 528-5557 • Fax (808) 528-0421 • www.prp-hawaii.com

Lee Sichter LLC
45024 Malulani Street #1, Kaneohe, Hawaii 96744
Ph. (808) 382-3836; Fax. (808) 234-0872; Web. www.leesichter.com

December 16, 2014

Mr. John White, Executive Director
The Pacific Resource Partnership
1100 Alakea Street, 4th Floor
Honolulu, Hawai`i 96813

Dear Mr. White:

Response to Comments on Kaka`ako TOD Overlay Plan Environmental Impact Statement Preparation Notice

Mahalo for your letter of January 21, 2013 providing comments on the EISPN for the TOD Overlay Plan. Following are our responses in the order your comments were presented in your letter.

1. We appreciate your statement of support for exploring the impacts of projected development within Honolulu's urban corridor. We agree that there will be substantial benefits to a well-managed growth strategy.

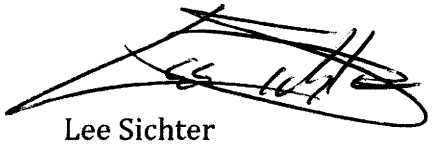
2. The Draft EIS will include an air quality impact analysis that will address the anticipated impacts from the TOD development within the Kaka`ako Community Development District (KCDD). It will also include a traffic study to determine what impacts the TOD development may have upon traffic in the KCDD, which in turn affects fuel use and emissions. The Draft EIS will also include an infrastructure analysis to determine energy demand, water demand, and wastewater treatment demand.

3. As the study is limited to the KCDD, it will focus on development within the district. Therefore, the issue of land consumption will also be limited to that area.

4. An economic analysis will also be conducted to determine the TOD project's fiscal impacts.

We appreciate your interest in the project and your participation in the Chapter 343 environmental review process. You will be provided a copy of the Draft EIS when it becomes available for your review and comment. We anticipate publication of the Notice of Availability of the Draft EIS in January 2015.

Very truly yours,
LEE SICHTER LLC



Lee Sichter

KAMEHAMEHA SCHOOLS

RECEIVED
2013 JAN 22 AM 11 33
HAWAII COMMUNITY
DEVELOPMENT
AUTHORITY

15384

January 22, 2013

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Amy Mutart
Project Manager
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawai'i 96813
Phone: (808) 594-0334

SUBJECT: Comments by Kamehameha Schools to the Transit-Oriented Development Overlay (the "Proposed Action")

Dear Ms. Mutart:

Kamehameha Schools ("KS") is generally supportive of the concepts described in the Proposed Action, including the concept of "complete streets." KS, however, wishes to ensure that the Proposed Action is consistent with, and promotes development pursuant to, master plan permit "PL MASP 13.2.8." issued by the Authority to KS on September 2, 2009. We also want to ensure that the Proposed Action will recognize and preserve the vested rights of KS under Hawai'i Administrative Rules chapter 15-22 then in effect (the "Applicable Mauka Area Rules").

In preparation of the environmental impact statement ("EIS"), both the development approved by the master plan permit and the Applicable Mauka Area Rules must be the starting point by which impacts from the Proposed Action are evaluated. It is our understanding that the Proposed Action will be an "overlay" to existing rules. Under this approach, KS should be able to adopt those new rules that are consistent with or enhance the quality of the development envisioned under the master plan permit and the Applicable Mauka Area Rules and not adopt those rules that are inconsistent with or impose additional requirements or constraints on such development.

Further, the EIS should address whether private developers or the Authority will be required to make certain improvements to the public rights of way as part of the "complete streets" program. Where it is contemplated by the Authority that such improvements will be made by private developers, the Authority should ensure that the EIS is sufficiently comprehensive so that such improvements do not require any further environmental assessments under Hawaii Revised Statutes chapter 343 or the rules promulgated thereunder.

It should be recognized that KS and other owners (including apartment owners) are paying real property taxes to the City to design, construct, repair, and maintain roadways and related infrastructure in Kaka'ako, including liability for the same. Such costs of, and liability for, such the improvements made to public property pursuant to the Proposed Action should rest with the City or the Authority and not shifted to private owners. Thus, the EIS should address these impacts on the City, the Authority, or both.

Finally, to implement the Proposed Action, the Authority, by agreement or otherwise, should either require the City to accept, without qualification, the dedication of the improvements on the City's property that are constructed in accordance with the complete street rules or assume responsibility for such property, including roadways. Absent the Authority or the City maintaining responsibility, the cost of liability could be shifted onto private developments and represent an undue burden.

Please advise me if you have any questions on these comments to the Proposed Action. Thank you for the opportunity to provide comment.

Sincerely,
Kamehameha Schools

Paul A. Quintiliani
Senior Director, Commercial Real Estate Division

Lee Sichter LLC
45024 Malulani Street #1, Kaneohe, Hawaii 96744
Ph. (808) 382-3836; Fax. (808) 234-0872; Web. www.leesichter.com

December 16, 2014

Mr. Paul A. Quintillani, Senior Director
Commercial Real Estate Division
Kamehameha Schools
567 South King Street,
Honolulu, Hawai`i 96813-3036

Dear Mr. Quintillani:

Response to Comments on Kaka`ako TOD Overlay Plan
Environmental Impact Statement Preparation Notice

Mahalo for your letter of January 22, 2013 providing comments on the Draft TOD Overlay Plan EISPN. Following are our responses in the order they were presented in your letter.

1. We appreciate you expression of general support and wish to assure you that the Draft TOD Overlay Plan considers the Kamehameha Schools Master Plan (PL MASP 13.2.8) as a baseline condition, and in so doing, preserves the vested rights of Kamehameha Schools. The TOD Overlay Plan is being presented as an overlay to the existing Mauka Area rules, which means that landowners will have the opportunity to take advantage of the density bonuses contemplated under TOD, but will not be obligated to do so. Development in the Kaka`ako Community Development District (KCDD) will proceed in the future pursuant to the existing rules, and the TOD Overlay Plan will represent a development option that will be available to landowners <u>if they choose</u>.
2. While the Draft EIS will document HCDA's commitment to implementing a Complete Streets program, the details concerning implementation will not be addressed. Those details will be addressed during rule making which cannot occur until the HCDA formally adopts the TOD Overlay Plan, which is presently in Draft form. Once the TOD Overlay Plan is finalized, in response to input received during the EIS comment process, the rule making process can begin, and will of course include public hearings. We appreciate your concerns about right-of-way improvements being covered by Chapter 343. However, as evidenced by the 2004 court decision regarding Turtle Bay Resort, the shelf life of an environmental assessment is not perpetual. Even if anticipated roadway improvements

are address in 2014, if they are not implemented in what may be judged by others as a "timely manner", they may be subjected to additional environmental assessment if conditions have changed that may be interpreted as resulting in new, previously undisclosed environmental impacts.

3. The Draft EIS will address the anticipated impacts that TOD will have upon infrastructure in the KCDD.
4. We acknowledge your concerns about the dedication of roadway improvements and the costs of liability. As you know, at the present time, the operation and maintenance of roadways within the KCDD fall under the jurisdiction of the City and County of Honolulu. The Authority is pursuing legislation that would transfer those obligations to the Authority, including liability.

We appreciate your interest in the project and your participation in the Chapter 343 environmental review process. As a Consulted Party, you will be provided a copy of the Draft EIS when it becomes available for your review and comment. We anticipate publication of the Notice of Availability of the Draft EIS in January 2015.

Very truly yours,
LEE SICHTER LLC

Lee Sichter

THE OUTDOOR CIRCLE

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HAWAII COMMUNITY
DEVELOPMENT
AUTHORITY

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Waimea Outdoor Circle
(Hawai`i)

January 18, 2013

Ms. Amy Mutart
Hawai`i Community Development Association
461 Cooke Street
Honolulu, HI 96813

Mr. Lee Sichter LLC
45024 Malulani St. #1
Kaneohe, HI 96744

Aloha,

Please accept this letter as a request by The Outdoor Circle to be named a consulting party in the Kaka`ako Community Development District Transit-Oriented Development EISPN.

Our statewide, 100 year old advocacy organization is concerned about numerous potential impacts from Transit-Oriented Development (TOD), including but not limited to the proposal to raise the height limit currently enforced in Kaka`ako.

We look forward to a fair and open process to determine the multitude of development issues raised by TOD.

Mahalo,

Robert Loy
Director of Environmental Programs

1314 South King Street, Suite 306 • Honolulu, HI 96814
Phone: 808-593-0300 • Fax: 808-593-0525 • Email: mail@outdoorcircle.org • www.outdoorcircle.org

Lee Sichter LLC
45024 Malulani Street #1, Kaneohe, Hawaii 96744
Ph. (808) 382-3836; Fax. (808) 234-0872; Web. www.leesichter.com

December 16, 2014

Mr. Robert Loy, Director of Environmental Programs
The Outdoor Circle
1314 South King Street, Suite 306
Honolulu, Hawai`i 96814

Dear Mr. Loy:

Response to Comments on Kaka`ako TOD Overlay Plan Environmental Impact Statement Preparation Notice

Mahalo for your letter of January 18, 2013 providing comments on the EISPN for the TOD Overlay Plan. We acknowledge your concerns about the potential impacts of the TOD in Kaka`ako, including but not limited to the issue of increasing the height limit in the Kaka`ako Community Development District (KCDD). The Draft EIS will include a discussion of height limits and how they may be impacted.

We appreciate your interest in the project and your participation in the Chapter 343 environmental review process. As a Consulted Party, you will be provided a copy of the Draft EIS when it becomes available for your review and comment. We anticipate publication of the Notice of Availability of the Draft EIS in January 2015.

Very truly yours,
LEE SICHTER LLC

Lee Sichter

Water Resources Research Center
Environmental Center

UNIVERSITY of HAWAI'I
MANOA

January 22, 2013
RE: 2012-12-23-03

Mr. Lee Sichter
Lee Sichter LLC
45024 Malulani Street #1
Kaneohe, HI 96744

Ms. Amy Mutart, Project Manager
Hawaii Community Development Authority
461 Cooke Street
Honolulu, HI 96813

VIA EMAIL TO: leesichter@gmail.com, contact@hcdaweb.org

Dear Mr. Sichter and Ms. Mutart,

Environmental Impact Statement Preparation Notice for the Kakaako Community Development District Transit-Oriented Development

The Hawaii Community Development Authority (HCDA) proposes a Conceptual Plan for Transit Oriented Development (TOD) within the Kakaako Community Development District (KCDD), under which the actual scope, timing, use, and intensity of development would depend largely upon the negotiations between individual project developers and the HCDA in accordance with TOD rules that have not yet been formulated. However, the proposed action—which would intend to maximize development in the district—would impact a 605 acre area within the Primary Urban Center, including an unspecified number and mix of parcels, as a result of various unspecified projects. The proposed action would generate one or more substantial secondary impacts; could substantially affect scenic vistas and view-planes; and could require substantial energy consumption.

This review of HCDA's Environmental Impact Statement Preparation Notice (EISPN) for the KCDD TOD is a service activity of the University of Hawaii's Environmental Center to help determine and maintain the optimum quality of the environment. It does not represent the official views of the University of Hawaii. The objectives of our review process are to enhance environmental consciousness, encourage cooperation and coordination, and facilitate public participation. Our review team included Sara Bolduc, Environmental Center.

General Comments:

This EISPN flows from HCDA's determination that, based on HCDA's judgment and experience, an EIS is likely to be required for the proposed action. Chapter 343, Hawaii Revised Statutes, and Chapter 11-200, Hawaii Administrative Rules, do not yet distinguish between the content requirements for EISPNs that result from (1) a notice of determination for a Final Environmental Assessment (FEA), and (2) a "Direct-to-EIS" agency determination that bypasses EA requirements. However, because the "Direct-to-EIS" option omits one layer of public participation that would otherwise occur through the EA process, it is particularly essential for agencies, applicants, and preparers to conduct rigorous and comprehensive consultation prior to

2500 Dole Street, Krauss Annex 19 Honolulu, Hawaii 96822
Telephone [illegible] Fax [illegible]
An Equal Opportunity/Affirmative Action Institution

and during the preparation of the Draft EIS (DEIS). Absent explicit additional regulations and guidance from the Environmental Council and the Office of Environmental Quality Control about EISPN content in "Direct-to-EIS" situations, it may be useful for such EISPNs to include—or to incorporate by explicit, access-enabled reference—a sufficient amount of background information and project description that would help readers to more fully understand a proposed action, submit more refined and targeted scoping comments, and be better-prepared to participate in the development and review the DEIS.

Overall we stress the requirements that an EIS (1) convey the information succinctly in easily understandable forms, and (2) address the counterveiling social benefits and environmental effects of reasonable alternatives. The following specific comments address potential information augmentation and process enhancement for the KCDD TOD EISPN.

Specific Comments:

1. ***Description of the Proposed Action***

Because the proposed TOD plan would "serve as an overlay on the existing rules governing development in the district," it would be useful to provide, in the EISPN, a citation to the existing rules. It is somewhat unclear how "proposed TOD development" would be substantively different from development that is already proposed in existing plans and would be compliant with existing rules; perhaps a comparative table would be useful. Given the intent of TOD development "to maximize development in the district * * *," it may be useful to quantitatively define, in the EISPN, the limits of targeted maximum development proposed—in terms of multiple metrics and indicators of urban growth and environmental effects—and to include a maximum build-out scenario in the DEIS. What specific types of multi-modal transportation infrastructure would be included in the TOD plan?

2. ***Location of the Proposed Action***

The proposed action would impact a 605 acre area within the Primary Urban Center. How much of this area would be within the footprint of direct effects as opposed to secondary and cumulative effects, and where? It would be useful for the EISPN to provide additional information about the tax map parcels included in the proposed action, such as:

- A map of the area covered by these parcels
- Total number of parcels included
- Size distribution of parcels
- Areal distribution of existing and proposed types of uses
- Existing and maximum population, traffic, and building density
- Area-wide existing and post-project surface permeability and runoff regime

3. ***Environmental and Cultural Sensitivity***

Because the EISPN does not provide a map of the area and does not reference previous assessment documents and independent sources of scientific information, it is difficult to review the assertion that the entire district does not include any environmentally sensitive natural

resources above and below ground, in various environmental media, transiting through the area, and in receiving waters. Given the acknowledged likelihood of encountering burials during property development, within what parts of the district have burials been encountered in the past and to what extent, where are they most likely to be encountered in the future, and how would assessment and mitigation planning for these potential impacts be conducted during DEIS preparation?

4. Planning Horizon

What major phases and timing can presently be identified across the planning horizon for the proposed action? How would the planning horizon interface with related planning horizons for transportation, infrastructure, environmental resource management, and other functional areas, at various levels of political and administrative organization? How would DEIS preparation be conducted to maximize the opportunity for cohesive, coordinated, and integrated planning and implementation? It may be useful to provide a tabulation or graphic representation of these relationships in the EISPN. Does HCDA plan to hold a public scoping meeting for the DEIS?

5. Agency Responsible for the Proposed Action

It may be useful to note that agencies other than HACD are also responsible for controlling development within the KCDD through the issuance of their own discretionary agency decisions. In order to provide a more detailed backdrop for the proposed action, it may be useful for the EISPN to include a table of permits and approvals that would be required for the proposed action. As noted previously, it would also be useful to provide citations for the existing development rules enacted by the HCDA Board. A timeline for the formulation of the new rules could also be provided, along with links to the scope of work for the contract that has been executed for rule development.

To what extent has HACD already solicited County planning advice and input, and conducted agency consultation?

6. Anticipated Future Development

It is somewhat unclear whether or not "redevelopment of the KCDD" is the same action as the proposed "development of the district," and in particular whether or not "other" development within the district" is encompassed within the proposed action. In any event, it would be useful to include more information in the EISPN about the size, scope, timing, use, intensity of development, and potential effects of these "other" projects, perhaps in summary tabular form, so as to better inform community understanding of the context for cumulative impacts that would be assessed during the development of the DEIS. Does "Howard Hughs Corporation" mean "The Howard Hughes Corporation," or is it a different entity?

7. Persons and Communities Impacted by the Action

It would be useful for the EISPN to explain HACD's plan and process for early and open discussion with interested persons and agencies during the development of the DEIS. In this regard, it may be useful to include a list of persons and agencies to be consulted, the topical area and objectives of each consultation, and the overall timeline for completion of the DEIS.

8. Determination/Reasons Supporting Determination

Given the admitted lack of detail about the actual scope, timing, use, and intensity of development, the bases for HCDA's determinations that the proposed action triggers Chapter 343 requirements, and that an EIS is required, are somewhat unclear. Because any proposed TOD development would be regulated by a new set of rules that are yet to be formulated, and it is well established that agency rulemaking in and of itself does not generally trigger HRS 343 requirements, perhaps environmental review of the proposed action would be more appropriate after the rulemaking process is completed? How would government funds be used to actually break ground within the district, short of paying for plan development, EIS preparation, and rulemaking? Although the EISPN discusses "substantial" impacts, effects, and requirements that would perhaps be associated with the proposed action, it does not identify "significant effects" relative to the significance criteria established by law, which if explicitly identified in the EISPN could help focus public participation in the scoping and development of the DEIS. Because "the prevailing rules governing the Mauka and Makai Districts of the KCDD were subject to environmental assessment pursuant to chapter 343" it would be useful for the EISPN to summarize the results of those assessments and provide citations for the supporting documents.

9. Identification and Analysis of Significant Effects

The EISPN and various conventional concerns point to some potentially significant environmental effects, assessment methods, and mitigation measures that seem to deserve careful attention in the DEIS:

> What would be the largest possible population change, and accompanying effects on public facilities, generated by the proposed action?
>
> How would the DEIS evaluate effects on scenic vistas and viewplanes? What would be the extent of height variances included in the proposed action?
>
> What alternatives would be considered to reduce energy consumption? How would the varying environmental effects of these alternatives be portrayed? It may be useful to develop footprint analyses and life-cycle analyses for various components of the proposed actions.
>
> What would be the maximum extent and effect of urban congestion associated with the proposed action, and how would it affect secondary and cumulative effects, given that the district is sandwiched between the dense neighborhoods of Waikiki and Downtown?

What would be the range of effects associated with tsunami run-up, flood inundation, and sea level rise affecting the district under the proposed action, particularly with regard to groundwater resources and subterranean infrastructure?

Thank you for considering our comments on the Environmental Impact Statement Preparation Notice for the Kakaako Community Development District Transit-Oriented Development. Please contact us at 956-3974 if you have any questions about this review, and please send us one paper copy of the Draft Environmental Impact Statement when it is published.

Sincerely,

/s/ David Penn

David Penn, Assistant Specialist

copy: State of Hawaii Office of Environmental Quality Control (OEQC)
Chittaranjan Ray, Interim Director, Environmental Center/Water Resources Research Center, UH Manoa
Sara Bolduc

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December 16, 2014

Mr. David Penn, Assistant Specialist
Water Resources Center/Environmental Center
2500 Dole Street, Krauss Annex 19
Honolulu, Hawai`i 96822

Dear Mr. Penn:

Response to Comments on Kaka`ako TOD Overlay Plan Environmental Impact Statement Preparation Notice

Mahalo for your letter of January 22, 2013 providing comments on the EISPN for the TOD Overlay Plan. Following are our responses in the order they were presented in your letter.

1. General Comments: We acknowledge your concerns about the need to provide rigorous and comprehensive consultation during the process of preparing a Draft EIS. It is for that reason that subsequent to the publication of the EISPN, the Authority released the Draft TOD Overlay Plan in May 2013 and subsequently conducted an extensive series of public meetings to present the document and initiate public review of it. Over 100 individuals, landowners, and agency representatives attended those meetings, and provided valuable input that has informed the EIS preparation process. The Authority has no intention of supplementing the EISPN with further information. The Draft EIS will provide sufficient information that decision-makers, agencies, and the general public will need to understand the environmental impacts of the Proposed Action.
2. Please be assured that the Draft EIS will attempt to convey the information in succinct and easily understandable terms.
3. The baseline condition that exists in the Kaka`ako Community Development District (KCDD) is guided by the existing development rules in place. Any future development must conform to those rules. The TOD Overlay Plan is offered as an incentive-based program for landowners who may wish to seek density and/or development bonuses. The TOD Plan is not intended to be a requirement, but rather a development option. Thus, the only alternative to the TOD Plan will be to proceed with development as allowed by the prevailing rules.

4. Specific Comments:

a. Description of the Proposed Action. The Draft EIS will quantify development in the KCDD under the Baseline Condition and the Proposed Action (TOD Overlay Plan). This will be presented in a series of easy-to-read tables and text. The reader will be able to readily assess the quantifiable effects of development at full build out under the existing rules (the Baseline Condition) and the Proposed Action (the TOD Overlay Plan). As the street network in the KCDD already exists, the TOD Plan contemplates transportation infrastructure improvements that will include the implementation of a Complete Streets program, which may include among other things the widening of sidewalks, improved access to the proposed transit stations, and changes to the timing of traffic signals at key intersections. The specific program of recommended transportation infrastructure improvements in the form of mitigation measures will be determined once a traffic study is completed for the Proposed Action. The traffic study, together with its program of mitigations (in the form of streetscape and transportation system improvements) will be presented in the Draft EIS.

b. Location of the Proposed Action. The Draft EIS will include a listing of all tax map parcels included in the KCDD. Unfortunately, it is not possible to prepare a composite map of all these parcels, as there are several hundred of varying sizes and to be included in the Draft EIS, the resulting map would be illegible. Rather, the Urban Design analysis to be included in the Draft EIS will distribute these parcels among Development Blocks, and these blocks will be identified and mapped. The proposed uses of the Development Blocks will be identified. Existing and maximum population together with traffic impacts will be provided. Building densities will also be addressed. With regard to existing and post-product surface permeability and runoff regime, please understand that the entire district is a mature urban area that is already served by an extensive storm-runoff and drainage system. The only permeable areas in the district correspond to park areas, which will be identified in the Draft EIS. Existing park areas will be preserved under the Proposed Action. New park areas will be delineated if applicable.

c. Environmental and Cultural Sensitivity. The Draft EIS will include maps of the area. But, because the KCDD is a mature urban area that consists entirely of developed and/or redeveloped properties and a paved street grid, there are no sensitive environmental resources present. The Draft EIS will disclose previous environmental impact statements that have been conducted for the KCDD. The Draft EIS will also contain a Supplemental Cultural Impact Assessment that will address, among other things, matters relating to burials. However, it keeping with standard protocol to preserve confidentiality for culturally sensitive matters, the Draft EIS will not include a map of

previously identified burials. The Supplemental Cultural Impact Assessment, will, however, include a soils map that can be used to indicate the location of sandy areas (where burials are most likely to have been conducted). With regard to assessment and mitigation planning for burials, subsurface testing will remain the obligation of individual landowners. At such time that they decide to pursue redevelopment of their specific property, they will conduct sub-surface testing to the extent required by law.

d. Planning Horizon. The 2035 Planning Horizon identified in the EISPN corresponds to planning horizons presently utilized by the City and County of Honolulu and the State of Hawaii. The most significant planning horizons existing for other aspects of development that might impact the KCDD are the planning horizons presently existing for the Kamehameha Schools' master planned area in the KCDD, the Ward Neighborhood master planned area to be developed by the Howard Hughes Corporation, and wastewater system improvements being conducted or contemplated by the City and County of Honolulu. With regard to the latter, a sewers master plan update being conducted as part of the Proposed Action analysis will be presented in the Draft EIS and will disclose planning horizons related to wastewater infrastructure that may influence development in the KCDD. However, it is important to understand that, as will be noted in the Draft EIS, the planning horizon for the Proposed Action is arbitrary; the actual development schedule for individual properties will be determined by their owners, and will likely be subject to economic cycles that are unknowable at the time the Draft EIS is being prepared. Thus, the planning horizon discussed in the Draft EIS is used to facilitate an evaluation of impacts with and without the Proposed Action. The actual and ultimate timing of development is beyond the control of the Authority. Lastly, as discussed above, the Authority conducted several public scoping meetings in 2013.

e. Agency Responsible for the Proposed Action. The Authority is solely responsible for promulgating and enforcing rules governing development within the KCDD. Any development within the district requires a development permit from the Authority. By law, the Authority is exempted from the need for discretionary land use approvals from the City and County of Honolulu. All development in the district does, however, require ultimately a building permit from the City. The Draft EIS will identify the prevailing development rules. No specific timeline has been established for rules development pertaining to the Proposed Action, other than that it will occur subsequent to finalization of the Draft TOD Plan. The scope of work for rules making includes the following elements:

    - Purpose and applicability

- Regulating Plan
- Development Standards
- Active Public Space Typology
- Land Use
- Parking
- Building Type
- Frontage Type
- Complete Street Treatment/Pedestrian Zone Treatment

The HCDA has engaged in regular and systematic coordination with the City and County of Honolulu, including the Board of Water Supply; the Departments of Planning and Permitting, Environmental Services, Transportation Services, and the Honolulu Authority for Rapid Transit.

f. Anticipated Future Development. The terms "development in the district" and "redevelopment in the district" are interchangeable. The term "other development" pertains to development that will occur irrespective of the TOD Overlay Plan, that is to say, development that will occur pursuant to the existing rules. The Draft EIS will discuss the extent of development anticipated in the district pursuant to the Baseline Condition (future without the Proposed Action) and the Proposed Action (future with the Proposed Action). We regret that the spelling error in the EISPN. The correct term is "The Howard Hughes Corporation".

g. Persons and Communities Impacted by Development. The Draft EIS will disclose the consultation process conducted after the publication of the EISPN.

h. Determination/Reasons Supporting Determination. The EIS is being prepared pursuant to Section 11-200-5B, Hawaii Administrative Rules. Government funds will be required for any public infrastructure-related improvements. The Draft EIS will disclose all significant effects identified as the result of the environmental assessment of the Proposed Action. The Draft EIS will include a discussion of previous environmental assessment conducted for the Mauka Area Plan and the Makai Area Plan. Regrettably, the wording of the phrase you cite has led to a misunderstanding. What was meant was that the Mauka Area Plan and Makai Area Plan were subjected to environmental assessment, not the rules per se.

i. Identification and Analysis of Significant Effects. The Draft EIS will disclose anticipated population change, and related impacts on public facilities with and without the Proposed Action. The Draft EIS will utilize photo overlays to demonstrate the visual impact of the Proposed Action on scenic vistas and viewplanes. The extent of height variances will also be disclosed. With regard to energy consumption, it is the Authority's intention to require that all new development be

LEED certified. However, the specific means for implementing this requirement will be left to individual landowners. At the time individual landowners seek development permits from the Authority, their specific strategy for LEED compliance will be reviewed by the Authority. A traffic study will be included in the Draft EIS to address traffic congestion, including secondary and cumulative effects. The Draft EIS will also address the effects associated with tsunami, flooding, and sea level rise.

We appreciate your interest in the project and your participation in the Chapter 343 environmental review process. As a Consulted Party, you will be provided a copy of the Draft EIS when it becomes available for your review and comment. We anticipate publication of the Notice of Availability of the Draft EIS in January 2015.

Very truly yours,
Lee Sichter LLC

Lee Sichter

Written Comments on Draft TOD Overlay Plan and Responses

15820

SERVCO PACIFIC INC.

2850 Pukoloa Street • Suite 300 • Honolulu, Hawaii 96819 • Telephone: (808) 564-1300 • Facsimile: (808) 523-3937 • www.servco.com

September 17, 2013

2013 SEP 19 PM 12 30

Via Email (deepak@hcdaweb.org) and Regular Mail

Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Attention: Deepak Neupane, P.E., AIA

RE: Draft Kaka`ako Transit Oriented Development Overlay Plan dated May 2013

Dear Mr. Neupane:

Servco Pacific Inc. ("***Servco***") is the current owner of the real property located at (a) 609 South Street on which it maintains its Motor Imports Parts and Service facility serving Toyota, Scion and Suzuki automobiles (the "***Servco South Street Property***"), and (b) 650 Kapiolani Boulevard on which it maintains its Lexus dealership and service department, and 645 Kapiolani Boulevard on which it maintains its pre-owned Lexus and used vehicle dealership (collectively, the "***Servco Kapiolani Property***"). The Servco South Street Property and the Servco Kapiolani Property will be directly impacted by the proposed Transit Oriented Development Plan for Kakaako (the "***TOD Overlay Plan***") as described and set forth in the Draft Kaka`ako Transit Oriented Development Overlay Plan dated May 20, 2013 (the "***Draft 2013 Kakaako TOD Overlay Plan***").

Based on its review of the Draft 2013 Kakaako TOD Overlay Plan, Servco has certain concerns relating thereto and has set forth below the following comments for your consideration:

1. Based on discussions with HCDA staff, Servco understands that the final TOD Overlay Plan is not intended to be mandatory as to the affected lands, but rather will contain a mechanism for the landowner to opt in, but only if the landowner so chooses. If the landowner does not opt in then the Kaka`ako District Mauka Area Rules will continue to govern development of the subject land. The landowner will not be allowed to pick and choose between the Kaka`ako District Mauka Area Rules and the TOD Overlay Plan. This non-mandatory opt in mechanism is not clearly articulated in the Draft 2013 Kakaako TOD Overlay Plan. The next version should clearly and expressly state that the TOD Overlay Plan is not mandatory as to the affected lands, and clarify that the landowner/developer must follow either the TOD Overlay Plan or the Kaka`ako District Mauka Area Rules. A combination of both cannot be used for development of the site. Servco also recommends that you clarify whether this is a one-time only option for the landowner when it next seeks to redevelop its parcel after adoption of the TOD Overlay Plan, or if a subsequent redevelopment of the parcel would allow for a separate opt in option.

2. If the landowner/developer of a parcel subject to the TOD Overlay Plan elects to be subject to and to follow the TOD Overlay Plan, please clarify:

a. The land uses that will be permitted as primary uses or conditional uses and which uses are not permitted within the area subject to the TOD Overlay Plan.

b. What conditions need to be met for development of a parcel if one opts to be governed under the TOD Overlay Plan? For instance:

i. Does the landowner/developer follow the appropriate land uses for its neighborhood as currently designated in the defined in the Mauka Area Plan and Rules?

ii. If a landowner/developer opts into the TOD Overlay Plan is the including of a residential element required to maximize the benefits contemplated under the TOD Overlay Plan?

3. The Draft 2013 Kakaako TOD Overlay Plan should be modified to explicitly state in the text that the Figures and references to a transit plaza associated with the Civic Center Station are only for illustrative purposes, and not a requirement with respect to the Civic Center Station. Servco is concerned that the reader may see the Figures and references presume that a transit plaza must be developed for the Civic Center Station in accordance with the examples and illustrations shown.

4. Page ES-7, Figure ES-6 Cycle Track concept on Halekauwila (also shown again on page 5-56, Figure 5-16): Will the transit support (as currently designed) be built in the center of Halekauwila Street as shown in the illustration? Please clarify the locations of the columns.

5. Page 1-8 Plan Time Horizons. "The planning horizon for the TOD Overlay Plan is 2035." An explanation of what this is intended to mean and include would be helpful.

6. Page 3-5 Strategy LU2 Reserved Housing. "TOD Overlay Zone's additional capacity is estimated to be predominantly residential, with a land use mix estimated at 85% residential and 15% commercial." Please provide an explanation as to why industrial uses are not included in this mix? Is there any intention to exclude such uses under the TOD Overlay Plan and thus require a landowner intending to provide industrial uses to remain under the Kaka'ako District Mauka Area Rules.

7. Page 3-9, Strategy LU6: Will parking be included in the calculation of maximum allowable floor area should a landowner opt into the TOD Overlay Plan?

8. Page 3-10, Achieving TOD – District Opportunities and Challenges: This section states "... the TOD Overlay Plan consolidates growth in the core area, while maintaining existing neighborhoods (i.e. a building currently limited to a low-rise will not become eligible for a high rise structure) ..." Servco requests that HCDA clarify what this statement is intended to mean. An example may be helpful.

9. Page 3-13, TOD Overlay Opportunities: Servco requests that HCDA identify which locations it considers most likely to undergo redevelopment within the time frame of the TOD Overlay Plan (2035). Are these locations indicated on Figure ES-2 TOD Selected Sites and Catalyst Properties?

10. Page 3-16, Figure 3-5 Property Consolidation. Addition of a color legend for this Figure would be beneficial and make it easier to understand the intention?

11. Page 4-22 Item b) Small Transit Plaza Associated with Civic Center Station. "A small transit plaza (1/4 block) should be developed within one to two blocks of the Civic Center Station to act as a meeting point and destination (to be confirmed by HCDA)." Servco finds the phrase "should be developed" to be confusing and misleading. What does this mean? Is it just an illustration of a potential development and use or is it more mandatory in nature in that HCDA will require such a development to occur within this area.

12. Page 5-31, Action MA8.2: "Integrate high quality pedestrian design into the interim use of surface parking lots." If the parking lot is an interim use, Servco questions why high quality pedestrian design would be needed? Servco requests that HCDA clarify its intentions.

13. Page 5-16, Figure 5-9 – Current KCDD Street Grid and Potential Future Connections: The Figure shows a service street between 650 Kapiolani and the One Kapiolani property, and is designated thereon as "opportunity for service street." Servco understands this is only for illustrative purposes - even if Servco opts into the TOD Overlay for its Servco Kapiolani Property? Is Servco's understanding

correct? When will it be determined that a surface street will be required? Who will construct this service street? Servco did not see this service street in the Thoroughfare Plan contained in the Mauka Area Rules.

14. Page 6-4. Building Community, Not Auto-Capacity: Sentence reads "On the other hand, local district streets like Queen Street, Cooke Street, and Ward Avenue are underutilized, with more pavement width than is necessary to carry current traffic volumes." This statement does not appear true. These are heavily trafficked with retail uses.

15. Page 6-16, Figure 6-3 KCDD Street Type-Land Use Relationship. How does Figure 6-3 tie in with Figure 6-2 KCDD Complete Street Typology? What does General Land Use Context on Figure 6-3 mean? How is it intended to integrate and work with the Mauka Area Rules? Sentence reads "Local Streets - Primary: Residential, Automotive (parking only; no drive-thrus, auto sales, etc.)," what does the sentence mean for auto sales? What does "etc." mean? Is this applicable only if a Kakaako property opts into the TOD Overlay Plan?

16. Page 7-4, first paragraph: Sentence reads "Furthermore, given that both station areas are planned for significant redevelopment, multimodal access demand should be based on future build-out conditions." What does this mean? This does not sound like there is an option not to opt-in to the TOD Overlay Plan. Servco understood that the option to opt in applied to all properties.

17. Page 7-13, Figure 7-9 Civic Center Station Access and Circulation. Servco requests an explanation as to how the area along Halekauwila Street will be affected by the contemplated sidewalk improvements and the direct impacts on the landowners whose parcels front on Halekauwila Street?

18. Page 7-21, Figure 7.13 Civic Center Station Vision and Opportunities. Servco recommends the insertion of explicit text to state that Figure 7.13 is meant only as an illustration to depict the noted station vision and opportunities. This text should be made part of the figure number and description.

19. Page 8-9, Strategy PT2, Remove Minimum Parking Requirements. "The following requirements would still apply to all parking built in the district....." Again, this provision does not sound like it is only applicable if a landowner opts into the TOD Overlay Plan. Servco requests that this be clarified.

20. Page 8-10, Recommended Rule Change PT3.1. FAR allocations are inclusive of parking. Again, this provision does not sound like it is only applicable if a landowner opts into the TOD Overlay Plan. Servco requests that this be clarified.

21. Page 8-12, Recommended Rule Change, PT6.1: "In commercial leases, parking must be included as a separate line item, with the quantity of parking to be leased determined by the lessee." Servco does not feel this recommended rule change makes practical sense. Servco does not envision that it would be appropriate for the quantity of parking to be leased to be determined unilaterally by the lessee as this language proposes. The parking to be provided under a commercial lease should be and remain a negotiated item between the lessor and the prospective lessee, and no such rule should be proposed.

22. Page 8-13, Recommended Rule change, PT 7.1. "Regulation permitting tandem and stacked parking by right." Clarify that the proposed rule change would allow the use by a landowner/developer of tandem and stacked parking to meet its parking needs as a matter of right without any need for regulatory approval? Is this going to present any issue or conflict with the City for building permit or other purposes, and is this intended to apply to all Kakaako properties whether or not the property opts into the TOD Overlay Plan.

23. Pages 8-14 through 8-19, Strategies PT8, 9 and 10. These strategies collectively appear to seek to require new multi-family or commercial developments in Kakaako to participate in a Transportation Demand Management Program (TDM) and to join and participate in a Transportation Management Association (TMA).

a. Is this intended to apply to all new Kakaako developments irrespective of whether they opt into the TOD Overlay Plan? That seems to be the intent but it should be clarified.

b. PT 10 states that HCDA should require, as a condition of new commercial development, that large employers (those with 50 or more employees) create, update every 5 years and implement a TDM plan. HCDA should clarify if this means at least 50 employees in a company (which may have locations outside of Kakaako) or just those that have 50 or more employees at the subject location in Kakaako?

c. There is mention of "...copies if documentation to ensure deed notification of mandatory participation in the final TDM program to all subsequent purchasers and owners of the project." Why is deed notification required? What happens if you opt-out of the TOD plan?

d. PT 9.2 and PT 10.2 seek to establish a requirement that new multi-family residential developments and large commercial employers are required to join the TMA. Is this practical and in the context of a multi-family residential development we are not talking about a developer, but rather a homeowners association? This should be clarified and explained. What about the unfairness to new developments in that these requirements would not appear to apply to existing multi-family residential developments or large employers.

24. Throughout the various chapters and in Appendix B, there is a section called Rule Changes for Kakaako (blue background). Will HCDA be formally proposing and going through the rule making process to implement these recommended rule changes? Will these recommended rule changes also be incorporated as revisions to the current Mauka Area Rules, not just as part of the TOD Overlay Plan? Is it intended that these recommended rule changes for Kakaako be all encompassing so it doesn't matter whether you opt into the TOD Overlay Plan? As the recommended rules are currently written, it does not sound like they apply only if you opt into the TOD Overlay Plan. HCDA should clarify its purpose and intent regarding application of the various proposed rule changes to the Kakaako Community Development District in general or only to properties opting into the TOD Overlay Plan.

25. In connection with the planned rail project in Kakaako, a portion of certain Kakaako properties will likely be acquired through negotiation under threat of condemnation and/or actual condemnation by the City for incorporation into the rail project. What is the manner in which the TOD Overlay Plan intends to handle the floor area attributable to the land areas acquired by the City for its rail project? Servco feels that it would be most appropriate for the TOD Overlay Plan to provide that the floor area for development purposes attributable to the land areas acquired by the City for its rail project shall remain with and be usable by the landowner whose land was so taken.

Lastly, please inform us of the manner in which we will receive responses to our above comments, and also how HCDA plans to keep the Kakaako community informed of its responses to all comments and/or questions provided during the public comment period on the Draft 2013 Kakaako TOD Overlay Plan.

If you should have any questions or would like to meet with us to discuss our comments and concerns, please feel free to contact Karen Shimizu at 564-1399 or myself at 564-1344. Thank you.

Sincerely,

SERVCO PACIFIC INC.

Carol K. Lam (B)
Senior Vice President

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

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Ref. No.: PL TOD 18.2

January 24, 2014

Ms. Carol Lam
Senior Vice President
Servco Pacific Inc.
2850 Pukoloa Street, Suite 300
Honolulu, Hawaii 96819

Dear Ms. Lam:

Re: Hawaii Community Development Authority Draft Transit-Oriented Development Plan Overlay, Environmental Impact Study

Thank you for your letter dated September 17, 2013 and interest in the subject Draft Kakaako Transit-Oriented Development Overlay Plan ("TOD Plan"). Your comments and questions on the TOD Plan are appreciated and will assist the Hawaii Community Development Authority ("HCDA") in providing more clarity as we move forward with the planning process.

The HCDA is preparing a Draft Environmental Impact Statement ("EIS") which will assess the impact of actions proposed under the TOD Plan. Publication of the draft EIS is expected in the 2nd quarter of 2014 and the time frame for formal public comment on the draft TOD Plan will coincide with the comment time frame for the draft EIS as the draft TOD Plan will be included in the draft EIS. Based on the comments received during the comment period of the EIS, the draft TOD Plan may require revisions to accommodate findings in the EIS. Rulemaking and Rule adoption for implementing the TOD Plan would follow after acceptance of the EIS by the Governor's Office. We note that rulemaking is a public process that requires comprehensive public consultation and a public hearing before the HCDA can adopt the Rules implementing the TOD Plan. Since the draft TOD Plan is still undergoing refinement, the following reflects our most reasonable responses to your questions at this point in time.

1. The TOD Plan and Rules is intended to be an "overlay" to the existing Kakaako Community Development District ("KCDD"), Mauka and Makai Area Plans and Rules. The Mauka and Makai Area Rules will continue to be in effect and act as the operational rules. The details of the how the

"overlay" will be implemented is yet to be decided and will be determined through the rulemaking process.

2. Allowable land uses will continue as to the land uses currently allowed under the Mauka and Makai Area Plans.

3. We note your comment on the transit plaza illustration and will make an appropriate disclosure in the TOD Plan.

4. Column locations for the rail alignment are determined by HART.

5. The planning horizon of 2035 was established to facilitate a comprehensive review of impacts for the purposes of environmental assessment. In actuality, full-build out of the KCDD will depend on economic cycles that cannot be predicted at this time. The year 2035 was selected as the planning horizon because at the time the EIS was initiated, it was the horizon year utilized by the State and the City and County of Honolulu ("City") in their population projections.

6. The land use policies in the TOD Plan focus intensive mixed-use redevelopment in areas near proposed HART transit stations. The estimated percentage allocation between residential and commercial development is based on development pattern that have been observed within the KCDD within the past 30 years. Industrial use in the KCDD is a requirement under Hawaii Revised Statutes, Chapter 206E, therefore, industrial use will continue to be an allowable use in the district.

7. The intent is to include parking in the maximum allowable floor area ratio ("FAR") under the TOD Plan. We note that the intent is to adjust the maximum allowable FAR to allow for inclusion of parking in the FAR. It is intended that in no case would the underlying FAR, exclusive of parking, will be less

than what is currently allowed under the Mauka Area Rules for specific neighborhoods.

8. Not all parcels or neighborhoods in the KCDD have potential for TOD development for reasons including parcel size, potential for consolidation, proximity to transit, encumbrances, and low improvement to land value ratio. For instance, the Sheridan neighborhood consists of small lots with various ownerships, limiting development potential in this neighborhood, hence the TOD Plan will have minimal influence there.

9. Figure 3-7 TOD Selected Sites and Catalyst Properties reflects land parcels that are most likely to have high redevelopment potential which properties included under the TOD overlay will get developed and at which time frame will mostly depend on each individual property owner, though for the purpose of the EIS a time horizon of 2035 is considered.

10. Your comment on a color legend is noted.

11. With the City's plan for 3 HART transit stations in the KCDD, it is necessary to coordinate station access and integration into TOD redevelopment. This aligns with HCDA's comprehensive policies that aim to create a network of safe and comfortable streets with convenient access to transit. The transit plaza associated with the Civic Center Station is not a mandatory requirement but a public space element that we believe is essential and supports HCDA's policy priorities.

12. The HCDA believes surface parking will remain part of the Kakaako streetscape for some time. Consistent with the plan policy, Action MA8.2 optimizes the streetscape for pedestrian experience, safety, and access.

13. This section of the TOD Plan covers multimodal transportation network for the district to achieve a balanced transportation

system for all users. Figure 5-9 is a recommendation of a street network that provides additional connections for autos, service vehicles, and pedestrians. It is HCDA's intent to work with landowners and developers to implement these principles in street design under TOD redevelopment.

14. Under the EIS, a traffic analysis will be conducted and should provide confirmation on traffic volume. As previously mentioned, the findings in the EIS may result in modifications to the draft TOD Plan.

15. This chapter of the TOD Plan touches upon the principles of Complete Streets, which provide parameters in street design that will support the needs of all users. Relating street types to adjacent land uses are one strategy in achieving this desired outcome. The HCDA intends to undertake separate guidelines for a Complete Street program which would be conducted in coordination with the City and other stakeholders.

16. This statement refers to the expected ridership at Kakaako and Civic Center stations. Emphasis is placed on pedestrian access and hence, the recommendations for station integration at the ground level, and with adjacent properties.

17. This section of the TOD Plan recommends strategies for enhancing pedestrian access to transit. Such strategies as sidewalk improvements along Halekauwila Street will require coordination with HART, the City, adjacent landowners and developers.

18. Your recommendation on Figure 7.13 is noted.

19. Your comment for clarification on parking is noted.

20. FAR allocations will be inclusive of parking in the TOD Plan. Parking requirements under the Mauka and Makai Area Plans

and Rules would remain unchanged, though a no parking minimums for TOD sites may be proposed.

21. Your comment on commercial parking is noted.

22. The recommended Rule change, PT 7.1 for tandem and stacked parking is proposed for TOD Rules. Parking requirements under the Mauka and Makai Area Plans and Rules would remain unchanged.

23. The HCDA envisions that a Transportation Demand Management ("TDM") program will require buy-in from stakeholders (new and existing) to have beneficial results. TDM recommendations and strategies may remain in concept in the TOD Plan, whereas Rules for its implementation would be developed at a future time.

24. The HCDA will conduct formal rulemaking for the TOD Plan following its adoption. The various proposed Rule changes in Appendix B are intended to address the TOD Plan. The HCDA may consider a broader application to existing Rules if appropriate.

25. We have been in discussions with HART to encourage prudent planning and integration of the rail transit stations in Kakaako. We anticipate continued dialog with the City and landowners along the rail alignment to arrive at a reasonable approach on allocating entitlements from land parcels acquired by the City for the rail transit project.

We will be happy to meet with you to discuss HCDA's responses provided above, and address any other questions you may have. Please do not hesitate to

contact Mr. Deepak Neupane, P.E., AIA, Director of Planning and Development, at 594-0300 or by email at deepak@hcdaweb.org.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN/AM:ak
c: Mr. Lee Sichter, Lee Sichter, LLC

15879

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HAWAII COMMUNITY DEVELOPMENT AUTHORITY

October 10, 2013

Mr. Anthony Ching, Director
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Dear Mr. Ching:

SUBJECT: Draft Transit-Oriented Development Overlay Plan
Kakaako Community Development District

We have the following comments on the Kakaako Community Development District Draft Transit-Oriented Development Overlay Plan (Plan) dated May 20, 2013:

Guiding Principles

1. The Plan should strive to exceed the requirements of the Kakaako Reserved Housing Rules (HAR §15-218) to address the serious housing cost issues and create affordable housing opportunities. Page 2-2 lists 'Social Equity' as a guiding principle for the Plan, and suggests that people with very low incomes, young people, and seniors will be able to enjoy the benefits of transit-oriented development (TOD) in Kakaako.

   The Kakaako Reserved Housing Rules require 20 percent of for sale and 15 percent of rental residential floor area be reserved for households making no more than 140 percent of the area median income (AMI). The rules also provide an incentive of 100 percent bonus floor area for projects making at least 75 percent of the units affordable for households earning no more than 140 percent AMI.

   For a three-person household, 140 percent AMI equates to an annual income of approximately $123,000; an income level wealthier than 70 percent of Honolulu households. While housing for households earning 140 percent AMI are referred to as "gap group housing" or "workforce housing", these units cannot reasonably be considered affordable housing.

   Considering that Honolulu is an attractive market for wealthy foreign investors, it is unlikely that developers will provide affordable housing units if they aren't required or provided with any incentives to do so. We suggest that the Plan call for the majority of the affordable units used to qualify for incentive bonus floor area ratio be reserved for households earning between 60 percent and 120 percent AMI.

While the reserved housing rules will provide some workforce housing units, we are concerned that the majority of the units will be targeted toward very wealthy individuals.

The Plan includes a number of very progressive and innovative elements that have tremendous potential to create a transit-oriented, vibrant, and walkable community. However, wealthier households use alternative modes of transportation far less than low- and moderate-income households. A failure to create a more mixed-income Kakaako could undermine many of the positive elements of the Plan. In other words, even if all the other components of good TOD are present in Kakaako, if the development that takes place there caters only to the wealthy, the community won't be transit-oriented.

There has been substantial public investment in infrastructure in Kakaako, and the rail project will represent tens of millions of dollars of additional public investment in that community. As such, the Hawaii Community Development Authority (HCDA) should ensure that the value added through those investments benefit a broad spectrum of our population.

2. Page 1-5, second paragraph, last sentence: "The intent of implementing transit oriented development is not to redefine the character of the existing neighborhoods, but to utilize TOD to enhance the existing quality of Kakaako as a whole." The sentence may underestimate the impact of redevelopment in Kakaako. The change from low density, low rise industrial development to high density, high rise residential and commercial development will likely redefine the character of Kakaako. That Plan could be more forthright about the potential impact of new development on the existing character of the community. With little to no additional usable public open space and parks provided, the redevelopmdent may not effectively enhance the quality of life in Kakaako.

Land Use

3. The Plan should address the capacity of existing infrastructure, particularly sewer and water, to deal with the higher densities that will result from the new regulations. The Plan should include a list of major infrastructure improvements needed and should outline a strategy for financing them.

4. It would be helpful to disclose the rationale for the increased height limits proposed for a limited number of projects such as 690 Pohukaina, and how those increased height limits will result in specific community benefits.

5. A strong community benefit package should be required of all development in Kakaako, not only for developers who opt in to the TOD Overlay requirements to meet the severe shortage in community facilities likely if Kakaako is developed at the densities and heights proposed in the Plan. Vancouver, B.C., offers a good community benefit model (requiring parks, day care centers, community meeting facilities, and affordable housing) before approving developments. We are looking at a similar strategy under our TOD program.

6. On page 4-20, the Plan references the Department of Parks and Recreation (DPR) Park and Facilities Standards for park space as being two acres of community park per 1,000 residents. The Plan states that HCDA will use this standard as a guide and that the parks makai of Ala Moana Boulevard will primarily be used to meet that standard.

   The parks located makai of Ala Moana Boulevard, while possibly being sufficient on an acreage basis, will fail to meet the community needs for recreational uses. It is our understanding that while DPR's standard is two acres of park per 1,000 residents, their preference would be for one acre of district park per 1,000 residents and one acre of other community-based parks, which can include mini-parks, 5-acre neighborhood parks, and 10-acre community parks. Some emerging policies indicate a need for urban parks within five blocks of residential development (St. Paul, Minnesota).

   Also, transit plazas, linear greenbelts, and passive parks like Thomas Square will not adequately substitute for active parks with recreational facilities. If it is not possible to provide the park acreage to accommodate active uses in an urban setting, the Plan should include requirements for alternatives such as recreational centers and gyms to compensate for the lack of space for ball fields.

   Two opportunities which could be explored are: 1) a three block expansion of the existing Gateway Park to link the Waterfront Park with Mother Waldron Park (expanding on the idea of a park-to-park connection along Cooke Street proposed in Kamehameha Schools' master plan for Kakaako), and 2) adding park space as part of the redevelopment of McKinley High School block. These sites could accommodate active and passive recreational uses including a recreation center, courts, ball fields, play equipment, walking, jogging, and bicycle paths.

7. The Plan recognizes the need for community and cultural facilities, such as schools, libraries, and community centers, however, it does not indicate a preference for their location. It also does not reflect them in the envisioned land use mix of "85 percent residential and 15 percent commercial." These types of facilities should anchor a community and be located near the planned rail stations, along with other core community services and retail.

8. The Plan calls for redevelopment of portions of the Neal Blaisdell Complex and McKinley High School. While the Complex is under the zoning jurisdiction of HCDA, it is owned by the City and any plans for redevelopment on that site should be undertaken jointly. Pursuant to State Senate Resolution 117, an inventory of State and County lands should be made to determine whether land exchange would further the goals and needs of the respective jurisdictions. The Plan should address how any redevelopment that takes place on either of those sites could be consistent with their historic and iconic character as community landmarks and gathering places. The Plan should discuss the regional impacts of losing convention space, should the Blaisdell Complex be redeveloped without it.

9. The Plan should prohibit or discourage auto-oriented uses such as drive-through facilities and automobile repair and sales near the rail stations.

10. The Plan seems to incorporate many of the same or similar land use objectives and policies as the Oahu General Plan and Primary Urban Center Development Plan (PUCDP). However, except for page 1-3, there is no other reference or discussion regarding how the General Plan and PUCDP should be integrated into the Plan. Although we understand the State may exempt themselves from county plans and zoning regulations in the Kakaako Community Development District, there is an opportunity to recognize that the State and City share many common goals regarding TOD and the development of Kakaako in general. For instance, the City encourages open space in urban areas, multi-modal transportation to reduce automobile usage, complete streets, and connectivity to improve circulation and manage automobile congestion.

    The Plan should include a section that discusses relevant county plans and policies. This new section should discuss the Plan's relationship to appropriate objectives, policies, and principles in the Oahu General Plan, PUCDP, Hawaii Capital, and Thomas Square Special Districts.

11. Provide a definition for "ground-oriented family housing" on page 3-5.

Mobility and Access

12. For your information, our Ala Moana Neighborhood TOD Plan will likely recommend adding bicycle lanes on Kapiolani Boulevard with two vehicle through lanes in each direction and a center turn lane. The Plan should consider incorporating this proposal.

13. Inter-agency coordination to achieve the strategies related to mobility and access, as presented in the TOD Overlay Plan, should be clearly identified with regard to project location, street section and participating agency. (Pg. 5-12)

14. Where new driveways are to be constructed, proper design of the driveway will negate the need for mirrors and noise signals. The use of these devices should be discouraged. (Pg. 5-32)

15. Driveway widths are based on the turning movements of a particular design vehicle requiring access to a development. The widths will be kept to the smallest width practical to minimize impacts to pedestrian traffic, while permitting safe access for vehicles. In most instances, the width will exceed 20 feet for two-way traffic. (Pg. 5-33)

16. Connectivity improvements for the Downtown area (Figure 7-11) should be extended to the Kakaako area and past the area controlled by HCDA.

17. Provide the rationale for prioritizing transit before bicycles in the modal hierarchy (or just change the hierarchy to prioritize bicycling). Bicycling is a fast, healthy, affordable, compact, and non-polluting mode of transportation.

Complete Streets

18. Figure 6-7 shows an aerial photograph labeled "Punchbowl/Kapiolani." However, this photograph actually shows the King Street/Kapiolani Boulevard intersection.

19. Waimanu Street, between Pensacola and Piikoi Street, is currently planned to be converted to a two-way street, not Kona Street. (Figure 5-9)

20. Roadway cross-sections for all streets should be specified. There does not appear to be enough existing right-of-way to achieve complete streets for most roadway facilities. The street section showing the desirable intersection elements (Figure 6-4) indicates a street right-of-way approaching 100 feet which will require additional land from adjacent property owners.

21. Conceptual design for all street intersections should be provided. The type of design vehicle should dictate the required curb radius (for a single unit design vehicle, the curb radius is 28 feet) and the amount of pedestrian storage, sight lines, and Americans with Disabilities Act compliant curb ramps should dictate the required property line radius.

22. A capacity analysis should be performed at each critical street intersection to determine the amount of vehicles and pedestrians that can be adequately processed during the peak traffic periods. The amount of permissible development, in relation to the effects of the intersections proximity to a transit station, should be limited if there is not enough capacity to support the projected vehicular and pedestrian demand. Traffic signal warrants should be performed at all major intersections to determine when traffic signals will need to be installed.

23. Traffic calming devices, such as roundabouts and mid-block splitters, should be provided at strategic locations in the area. The location and type of these devices should be identified. Where space permits, roundabouts should be a preferred strategy to address capacity issues.

24. All unimproved streets, such as portions of Queen Street, Cummins Street, portions of Waimanu Street, portions of Pensacola Street, and especially streets in close proximity to transit stations, should have a definitive time schedule of when the streets will be improved.

25. Curb extensions at intersections could be utilized, provided there is not a significant demand for right turning vehicles, otherwise, a pedestrian island should be considered.

HART Stations and Access

26. The correct name of the plan referred to in Action SA9.1 and Figure 7-11 is the Downtown Neighborhood Transit-Oriented Development Plan.

Miscellaneous

27. All the maps presented as figures could benefit from showing the two station locations at the center of a ¼-mile and ½-mile circle similar to the figures in the Neighborhood TOD Plans prepared by the City. It makes it easier to determine which projects are likely to benefit from access to the transit stations.

Should you have any questions regarding these comments, please contact Shem Lawlor of our staff at 768-8046.

Very truly yours,

George I. Atta

George I. Atta, FAICP
Director

GIA:js

HCDA TOD Plan

HAWAII COMMUNITY
DEVELOPMENT AUTHORITY

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KALAEOA

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Ref. No.: PL TOD 18.2

December 18, 2014

Mr. George I. Atta, FAICP, LEED AP, CEI
Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. Atta:

Re: Department of Planning and Permitting Review Comments on the Hawaii Community Development Authority Draft Transit-Oriented Development Plan Overlay, Environmental Impact Study

Thank you for your letter dated October 10, 2013 commenting on the Hawaii Community Development Authority ("HCDA") Draft Transit-Oriented Development Plan Overlay ("TOD Plan"). We have updated the TOD Plan and will be issuing a Draft Environmental Impact Statement ("DEIS") shortly, a copy of which you will be receiving. The DEIS will include discussion on some of your concerns, and following, we offer further comments for your use and information. We welcome any additional comments or concerns on the TOD Plan and DEIS.

Guiding Principles

1. Your comments that "the Plan should strive to exceed the requirements of the Kakaako Reserved Housing Rules to address the serious housing cost issues and create affordable housing opportunities..." are noted, and the HCDA has been evaluating its Kakaako Reserved Housing Rules for any modifications that may be beneficial to the State.

2. The intent of the TOD Plan is to provide TOD development opportunities where it makes most sense, and hence is likely to be near or around the planned transit stations. Not all land parcels are appropriate for TOD density and hence implementation of the TOD Plan is not envisioned to redefine the character of the larger Kakaako.

Land Use

3. The DEIS will include an analysis of the infrastructure capacity for water and sewer systems.

4. Density increases proposed in the draft TOD Plan for certain project parcels are part of the vision for an urban design framework that encourages diversity in mass and volume, and permitted upon the provision of exceptional public benefits. These parcels demonstrate opportunities for redevelopment with capacity increases under rationale including, proximity to transit station, parcel size, encumbrances, potential for consolidation, and land to improvement value ratios. We believe that the discussion on page 4-2 of the TOD Plan clearly articulates the rational for increased height limits being considered for some properties in the KCDD.

5. We believe TOD development will provide public benefit not only in the forms of public facilities and open space, but also quality of life benefits such as accessibility to housing, work, entertainment, and other services within walking distance. We concur communities built this way, such as Vancouver, B.C., are good models of livable, sustainable, and resilient places. Developers who elect to participate in the incentive based TOD Plan, must present a project with exemplary public benefit. A clearer understanding of specific public benefits is expected when TOD rules are developed. However, the addition of a community benefit package to the existing Mauka Area Rules would require an amendment to those rules and is beyond the scope of the Proposed Action.

6. The HCDA will look into opportunities to meet additional community needs for park and recreational uses. To that end, the HCDA recently commenced a master planning process to address parks and recreational needs in the District. We believe that the TOD Plan represents a unique opportunity to work with prospective developers to achieve the outcomes to which your agency, the Department of Parks and Recreation, and the HCDA collectively aspire. The lack of large tracts of publicly owned land within the KCDD makes it challenging to provide additional parks in the District. Purchase of private land for parks would be cost prohibitive. As you have pointed out in your letter, redevelopment of McKinley High School block as well as the

Neal Blaisdell Complex provides opportunities to create additional active and passive recreation space.

7. Land uses for community facilities such as schools are dependent upon planning policy and decisions that will take place outside the TOD Plan. The HCDA has been continually working with the Department of Education in assessing future school needs for the KCDD. The Cultural Impact Statement that has been recently completed, and which will be included in the forthcoming DEIS, concludes that many of the contemporary cultural activities and facilities located within the KCDD are present because of private-sector initiatives, and are largely market driven. To that end, they are, in fact, a part of the commercial development within the District.

8. We concur that any plan for redevelopment of the Neal Blaisdell Complex would benefit from joint efforts of the State and County. We also recognize that decisions concerning the ultimate use of the property rest with the landowner (the "City"). Therefore, addressing the historic and iconic character of redevelopment would be best achieved by the City as part of its redevelopment process. While HCDA's preferences for the site are itemized on page 3-19 of the TOD Plan, it will be the City's responsibility to ensure that redevelopment of the property does not result in the loss of convention space.

9. Industrial uses are not predominate in TOD, however we continue to support industrial uses in central Kakaako. The TOD Plan responds to the desires of landowners in the Central Kakaako neighborhood to preserve the character of the area. We concur commercial drive-through facilities are not an appropriate use near the rail stations. Our plan for access and mobility throughout the District places pedestrians first in the hierarchy. Please refer to Objective D2 on page 2-4 and Objective D6 on page 2-6 of the TOD Plan. In addition, the discussion beginning on page 5-71 and ending on page 5-75 collectively addresses our agency's desire to reduce the predominance of automobile use in the District.

10. Your comment on the Oahu General Plan and Primary Urban Center Development Plan is noted. However, please note that the discussion on page 4-6 of the plan specifically addresses PUC-related concerns about view

corridors. As previously stated, now that the TOD Plan has been published, an EIS is being prepared to evaluate its impacts. We believe that the EIS is the best forum for the relationship of the Proposed Action (the TOD Plan) to existing plans and policies. Chapter Five of the DEIS will address your concerns.

11. The concept of "ground-oriented family housing" refers to the orientation of family-oriented housing to the ground floor of structures, such as townhouses at street level, or larger size units in tower podiums. The intention is place family-oriented housing on lower levels or as close to ground level as possible, which is more desirable for families than living on upper floors.

Mobility and Access

12. Figure 5-15 on page 5-53 of the TOD Plan identifies Kapiolani Boulevard as a "High Stress Bicycle Street" but assumes that additional bike lanes may be added at some point in the future. While the City's recommendation that bike lanes be added to Kapiolani Boulevard is not at odds with the TOD Plan, we would note that the traffic impact study conducted for the EIS did not assume the loss of lanes on Kapiolani Boulevard. Nevertheless, if the City is intending to implement additional bike lanes on Kapiolani Boulevard in the near future, the HCDA can make the necessary adjustments in the Final TOD Overlay Plan.

13. Comment noted.

14. Comment noted.

15. Comment noted.

16. We concur and would work towards inter-agency coordination to achieve such connectivity improvements beyond HCDA's district boundaries. The HCDA is committed to coordinating with its sister agencies at both the City and the State to ensure that connectivity is achieved with streets outside the District Figure 7-11 is not intended as the final depiction of connectivity, but rather is intended to be illustrative of information that was known at the time the TOD Plan was published.

17. Transit was given a higher priority in the modal hierarchy because it carries far more people in comparable street right-of-way compared to a cycle lane. This is not a firm policy but rather a policy approach in considering right-of-way prioritization. Priorities can be adjusted on a contextual basis when considering individual street design.

Complete Streets

18. Comment noted.

19. Comment noted. We have noted since your letter, the conversion of that portion of Waimanu Street has taken place.

20. The DEIS will present typical roadway cross-sections, and these will be incorporated as needed into the final TOD Overlay Plan.

21. Comment noted.

22. A traffic study will be included in the DEIS, which will be used to inform decision making in finalization of the TOD Overlay Plan.

23. Comment noted.

24. Comment noted.

25. Comment noted.

Hart Stations and Access

26. Comment noted.

27. Comment noted.

Should you have any questions regarding these comments, please contact Mr. Deepak Neupane, P.E., AIA, Director of Planning and Development, at 594-0338.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN/AM:ak
c: Mr. Lee Sichter
(Lee Sichter, LLC)

Written Comments on Draft EIS and Responses

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:
EPO 15-007

January 12, 2015

Lee Sichter LLC
45024 Malulani Street #1
Kaneohe, HI 96744

Dear Lee Sichter:

SUBJECT: DEIS Review for the TOD Overlay Plan for the KCDD

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your DEIS to our office on January 8, 2015. Thank you for allowing us to review and comment on the proposed TOD Overlay Plan available on the OEQC website at:
http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Oahu/2010s/2015-01-08-OA-5B-DEIS-Kakaako-Community-Transit-Oriented-Development-Overlay-Plan.pdf

The DEIS was routed to various branches. The various branches will provide specific comments to you if necessary. EPO recommends that you review the standard comments and available strategies to support sustainable and healthy design provided at: http://health.hawaii.gov/epo/home/landuse-planning-review-program/. Projects are required to adhere to all applicable standard comments.

We encourage you to examine and utilize the Hawaii Environmental Health Portal. The portal provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings. The Portal is continually updated. Please visit it regularly at:
https://eha-cloud.doh.hawaii.gov

You may also wish to review the revised Water Quality Standards Maps that have been updated for all islands. The Water Quality Standards Maps can be found at:
http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/water-quality-standards/.

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design.

Mahalo nui loa,

Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

c: Ms. Amy Mutart, HCDA, 461 Cooke St., Honolulu, HI 96813
CAB, CWB, WWB, SDWB, SHWB, SAN, IRHB, TSP {via email only}

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
Governor

John Whalen
Chairperson

Anthony J. H. Ching
Executive Director

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Facsimile
(808) 587-0299

E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL TOD 18.3

June 10, 2015

Ms. Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801-3378

Dear Ms. McIntyre:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated January 12, 2015 commenting on the above document. Following are responses to your comments in the order they were presented in your letter.

1. We acknowledge that you reviewed the document on the OEQC website.

2. We acknowledge that the DEIS was routed by to various branches of the Department of Health which may provide additional comments.

3. We acknowledge your recommendation to review DOH standard comments and available strategies to support sustainable and healthy design at your website.

4. We acknowledge your comment that projects are required to adhere to all applicable standard comments.

5. As HCDA is not a developer, your suggestion that the Environmental Health Portal be examined and utilized will be passed on to individual applicants at the time they enter the Development Permit process.

6. Mahalo for the link you provided to the Water Quality Standards Maps.

7. We will advise Development Permit Applicants of the need to utilize this information you provided.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

16735

U.S. Department of Transportation
Federal Aviation Administration

Western-Pacific Region
Airports District Office

300 Ala Moana Blvd., Rm. 7-128
Honolulu, HI 96813
MAIL: Box 50244
Honolulu, HI 96850-0001
Telephone: (808) 541-1232
FAX: (808) 541-3566

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HAWAII COMMUNITY DEVELOPMENT AUTHORITY

January 9, 2015

Hawaii Development Community Authority (HDCA)
461 Cooke Street
Honolulu, Hawaii 96813

Dear HDCA:

SUBJECT: Draft Environmental Impact Statement; Transit-Oriented Development Overlay - Kakaako Community Development District; Honolulu, Hawaii

We have reviewed the Draft Environmental Impact Statement for the Transit-Oriented Development (TOD) Overlay - Kakaako Community Development District.

Subject to *14 Code of Federal Regulation (CFR) Part 77: Safe, Efficient Use, and Preservation of the Navigable Airspace*, the Federal Aviation Administration (FAA) requires notification of proposed construction on and near a public-use airport. Notification is done through submittal of information contained on FAA Form 7460-1, Notice of Proposed Construction or Alteration. FAA notification is done through the following website:

https://oeaaa.faa.gov/oeaaa/external/portal.jsp

FAA notice criteria for proposed construction is required when:

(a) Any construction or alteration that is more than 200 ft. AGL at its site.

(b) Any construction or alteration that exceeds an imaginary surface extending outward and upward at any of the following slopes:

(1) 100 to 1 for a horizontal distance of 20,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway more than 3,200 ft. in actual length, excluding heliports.

(2) 50 to 1 for a horizontal distance of 10,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway no more than 3,200 ft. in actual length, excluding heliports.

(3) 25 to 1 for a horizontal distance of 5,000 ft. from the nearest point of the nearest landing and takeoff area of each heliport described in paragraph (d) of this section.

(c) Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted upward 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance; 15 feet for any other public roadway; 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road; 23 feet for a railroad; and for a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it, would exceed a standard of paragraph (a) or (b) of this section.

An airspace analysis will be conducted upon submittal of the information to determine the effect on safe and efficient use of navigable airspace and air navigation facilities.

The proposal to increase the height limits of structures up to 700' may affect navigable airspace. The airlines may also have additional operational requirements that may be affected by the higher building heights. We recommend you contact the airport and airlines for further comments.

Sincerely,

Gordon K. Wong
Lead Program Manager

Ronnie V. Simpson
Manager, Airports District Office

cc: State of Hawaii, Department of Transportation, Airports Division

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
Governor

John Whalen
Chairperson

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Web site
www.hcdaweb.org

Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Gordon K. Wong
Lead Program Manager
Western-Pacific Office, Airports District Office
Federal Aviation Administration
U.S. Department of Transportation
P. O. Box 50244
Honolulu, Hawaii 96850-0001

Dear Mr. Wong:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated January 19, 2015 commenting on the above document. Following are responses to your comments in the order they were presented in your letter.

1. We acknowledge the FAA requirement for proposed construction projects to submit to you FAA Form 7460-1 through the website address you provided.

2. We acknowledge the FAA Notice Criteria you provided in your letter and understand that your staff will conduct an airspace analysis based upon the information submitted.

3. Please understand that no buildings are proposed to be built to heights up to 700 feet at this time. The prevailing height limit in the Kakaako Community Development District is 418 feet. To exceed that height would require an Act of the Hawaii State Legislature. Building heights in excess of the prevailing height limit are discussed in the Draft EIS as an alternative for the purposes of full disclosure.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

1675

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:
LUD – 1 2 1 014 006 DEIS
KakaakoCommDev TOD-ID2026

January 17, 2015

Mr. Anthony J.H. Ching, Executive Director
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Dear Mr. Ching:

Subject: Draft Environmental Impact Statement (DEIS) for the Kakaako Community Development District Draft Transit-Oriented Development (TOD) Overly Plan
At 170 Aloha Tower Drive, Honolulu, Hawaii 96813
TMK (1) 2-1-014: 006 Aloha Tower Special District

Thank you for allowing us the opportunity to provide comments on the above subject project. We have the following information to offer.

The subject project is located in the critical wastewater disposal area as determined by the Oahu Wastewater Advisory Committee. The Department does not have enough information at this time to provide comments regarding the wastewater collection and treatment system and its capacity to accommodate the additional wastewater flows from the proposed project.

All wastewater plans must conform to applicable provisions of the Hawaii Administrative Rules, Chapter 11-62, "Wastewater Systems." Should you have any questions, please contact Mr. Mark Tomomitsu of our branch at 586-4294.

Sincerely,

SINA PRUDER, P.E., CHIEF
Wastewater Branch

LM/MST:lmj

c: Ms. Laura McIntyre, DOH-Environmental Planning Office (15-007)
Mr. George I. Atta, C&C of Honolulu, Dept. of Planning & Permitting 7th Floor

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www.hcdaweb.org

Ref. No.: PL TOD 18.3

June 10, 2015

Ms. Sina Pruder, P.E., Chief
Wastewater Branch
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801-3378

Dear Ms. Pruder:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated January 17, 2015 commenting on the above document. Following are responses to your comments in the order they were presented in your letter.

We acknowledge that your department does not have enough information at this time to provide comments regarding wastewater collection and treatment for the TOD Overlay Plan. As individual applicants enter the Development Permit process, the specifications for specific projects will be submitted to your department for review.

We acknowledge that all wastewater plans must conform with the applicable provisions of Chapter 11-62, HAR.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

01025PGH.15

January 27, 2015

Mr. Anthony J. H. Ching
Executive Director
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Attention: Ms. Amy Mutart

Dear Mr. Ching:

SUBJECT: Comments on Draft Environmental Impact Statement for Kakaako Community Development District Draft Transit-Oriented Development Overlay Plan

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated December 18, 2015, requesting comments on your project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. The Kakaako TOD plan includes areas which are regulated by a National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit. Any planning document must address how all activities identified in the document, including new development, re-development, land use, etc., will take into consideration how the activities identified in the plan must comply with the subject area's NPDES MS4 permit. This doesn't just include what construction or building permits will

be required, but rather how the development plan, infrastructure installation and landscaping will be designed to meet water quality requirements.

3. The TOD should incorporate a reminder of NPDES permit coverage obligations (i.e. MS4 permits, Construction and or Industrial Stormwater Permits, etc.) required in Hawaii for discharges of wastewater or certain types of storm water runoff into State surface waters (HAR, Chapter 11-55).

   For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for a NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge.

4. The TOD should also incorporate a reminder of Clean Water Act (CWA) Sections 404 and 401 permitting obligations. For projects involving work in, over, or under waters of the United States, it is highly recommended that the project owner contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) regarding their permitting requirements under the CWA Section 404.

   Pursuant to Federal Water Pollution Control Act [commonly known as the CWA], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses. Project planning should:

   a. Treat storm water as a resource to be protected and maximize beneficial uses by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated to a status analogous to a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

   b. Clearly articulate the State's position on water quality and the use of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g. minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

   c. Envision the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.

   d. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

   e. Identify all State waters for which considerations must be made. This includes, but is not limited to, subterranean streams, surface waters, wetlands, springs, seeps and coastal areas. Every effort should be made to protect, restore and provide access and recreational use of the State waters for the benefit of the community. This must be identified during the planning stages such that community development plans can include the integration of State waters in early planning and design efforts.

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb/, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

GH:bk

c: DOH-EPO
Mr. Lee Sichter, Lee Sichter, LLC

HAWAII COMMUNITY
DEVELOPMENT AUTHORITY

KAKAAKO
KALAEOA

David Y. Ige
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Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Alec Wong, P.E., Chief
Clean Water Branch
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801-3378

Dear Mr. Wong:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated January 27, 2015 commenting on the above document. Following are responses to your comments in the order they were presented in your letter.

HCDA acknowledges the need to review your standard comments at the website address provided in your letter.

1. HCDA acknowledges that the impacts of any project must meet the criteria you identify.

2. As the TOD Overlay Plan is intended to provide guidance for future development by individual landowners, it will be up to future permit applicants to determine whether their proposed project will trigger an NPDES permit and to then specify how their particular development plan will be comply with water quality requirements.

3. Section 2.5 of Chapter Two identifies NPDES as being a required permit. As stated above, it will be up to individual development applicants to submit an NOI form to you.

4. As the TOD Overlay Plan is generally limited in scope to the Mauka District of the Kakaako Community Development District (KCDD), an area extending mauka from Ala Moana

Boulevard to King Street between Punchbowl and Piikoi, it will result in no work in, over, or under waters of the United States. HCDA acknowledges that any particular development that may result in any discharge to navigable waters will be required to secure Water Quality Certification from your branch prior to the anticipated discharge activity.

5. HCDA acknowledges that all projects associated with the TOD Overlay Plan must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses.

   a. It will be up to individual developers to determine how storm water discharge from their particular property might be best utilized as an asset.

   b. Individual projects must address implementation methods to conserve natural resources at the time specific applications for development are submitted to the HCDA.

   c. Section 4.12.6.5 of Chapter Four specifically addresses HCDA's policy to encourage green landscaped podiums as part of new development.

   d. Opportunities to address retro-fitting or bio-engineering of existing storm water infrastructure will be addressed on a case-by-case basis as Development Permit applications are reviewed by HCDA.

   e. The TOD Overlay Plan addresses an area that contains no State waters.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

1669

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET· www.honolulupd.org

KIRK CALDWELL
MAYOR

LOUIS M. KEALOHA
CHIEF
DAVE M. KAJIHIRO
MARIE A. McCAULEY
DEPUTY CHIEFS

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HAWAII COMMUNITY DEVELOPMENT AUTHORITY

OUR REFERENCE MT-DK

January 29, 2015

Mr. Lee Sichter, LLC
c/o Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Dear Mr. Sichter:

This is in response to your letter requesting the Honolulu Police Department's comments regarding the Draft Environmental Impact Statement (DEIS) for the Transit-Oriented Development Overlay Plan - Kakaako Community Development District.

We have reviewed the DEIS and are concerned about the use of the rail system for evacuation purposes. An alternative evacuation plan should be implemented in the event that a natural and/or man-made disaster should cause the rail system to become inoperable.

If there are any questions, please call Major Roy Sugimoto of District 1(Central Honolulu) at 723-3327.

Thank you for the opportunity to review this project.

Sincerely,

LOUIS M. KEALOHA
Chief of Police

By
MARK TSUYEMURA
Management Analyst VI
Office of the Chief

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
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Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Louis M. Kealoha
Chief of Police
Honolulu Police Department
City and County of Honolulu
801 South Beretania Street
Honolulu, Hawaii 96813

Dear Chief Kealoha:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated January 29, 2015 commenting on the above document. While we acknowledge your concern about the use of the rail system for evacuation purposes, HCDA has no authority over the use of the rail system. That responsibility rests with the Honolulu Authority for Rapid Transportation (HART). It is our understanding that during times of emergency if evacuations are necessary they are coordinated between the Civil Defense Agency and the Honolulu Police Department. We agree that evacuation plans should take into account the fact that in the event of a natural and/or man-made disaster the rail system could become inoperable.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

1669

DAVID Y. IGE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

CARTY S. CHANG
ACTING CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FIRST DEPUTY

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DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
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CONSERVATION AND COASTAL LANDS
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

COR: OCCL: AJR

COR: OA-15-118

JAN 28 2015

HCDA
461 Cooke Street
Honolulu, HI 96813

RECEIVED
2015 JAN 30 AM 11 3
HAWAII COMMUNITY DEVELOPMENT AUTHORITY

SUBJECT: **DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS), KAKA'AKO COMMUNITY DEVELOPMENT DISTRICT (KCDD)**
Honolulu District, Island of Oahu
TMK: Various in: Aloha Tower Special District & Kaka'ako

To whom it may concern,

We are in receipt of your request for comments dated *January 12, 2015*, regarding the Draft Environmental Impact Statement (DEIS) for the proposed Transit Oriented Development (TOD) Overlay Plan for the *Kaka'ako Community Development District* (KCDD).

The Office of Conservation and Coastal Lands (OCCL) has reviewed your DEIS and would like to recognize and acknowledge your commitment to addressing potential long- and short-term influences on the proposed project in regard to Global Climate Change and subsequent Sea Level Rise. This is especially relevant for the development of low-lying areas such as Kaka'ako.

Act 83 (*HB 1714*), or the *Hawaii Climate Adaptation Initiative Act*, aims to address the potential effects of Global Climate Change and Sea Level Rise on Hawaii's existing and future infrastructure, environmental resource management, and development. At this time the OCCL and the Office of Planning (OP) are coordinating the development of a State-wide *Sea Level Rise Vulnerability and Adaptation* report that will provide guidance for future development projects; therefore we would appreciate a continued involvement in the planning process.

If you have any questions regarding this correspondence please contact Alex J. Roy, M.Sc. of our Office of Conservation and Coastal Lands staff at 808-587-0316.

Sincerely,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
Governor

John Whalen
Chairperson

Anthony J. H. Ching
Executive Director

547 Queen Street
Honolulu, Hawaii
96813

Telephone
(808) 594-0300

Facsimile
(808) 587-0299

E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Samuel J. Lemmo, Administrator
Office of Conservation & Coastal Lands
Department of Land and Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Lemmo:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter that was received on January 30, 2015 commenting on the above document. Mahalo for your expression of support for our efforts regarding global climate change and sea level rise. We look forward to the completion of your report on sea level rise and adaptation and to your involvement in the planning process.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

1611s

HONOLULU FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF
LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

RECEIVED
2015 FEB 3 AM 11 32
HAWAII COMMUNITY DEVELOPMENT AUTHORITY

February 2, 2015

Ms. Amy Mutart, Project Manager
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Dear Ms. Mutart:

Subject: Draft Environmental Impact Statement (DEIS)
Transit-Oriented Development Overlay Plan for the Kakaako Community Development District

In response to a letter received on January 7, 2015, from Lee Sichter LLC regarding the above-mentioned subject, the Honolulu Fire Department (HFD) provides the following:

The HFD concurs with the narratives in Chapter 4, Sections 4.10.8.1 and 4.10.8.2 of the DEIS. We offer further support for those narratives with additional comments, recommendations, and requirements.

The Hawaii Community Development Authority (HCDA) estimates that planned Kakaako developments will increase the residential population by 20,000 to 40,000 individuals by 2030. Those residents will occupy units built in numerous new high-rise buildings. Hundreds of thousands of square feet of new commercial occupancies will attract a multitude of people to the area.

The HFD's current resources will not be able to adequately handle the projected residential and transient populations, proposed new residential structures, and additional commercial development. Our Kakaako and Pawaa Fire Stations are over 40 years old and were not designed to accommodate this proposed growth.

The HFD is committed to meeting national standards for the delivery of first responder services. The National Fire Protection Association (NFPA) is the industry leader in determining acceptable fire service standards throughout the U.S., which is utilized to establish reasonable standards for the delivery of the HFD's services. The HFD strives to achieve this objective by meeting the criteria set forth in NFPA 1710: Standard for

Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.

NFPA 1710 mandates that the travel time for the first-arriving unit responding to emergencies in urban communities, such as Kakaako, be within four minutes. Every minute of increased travel time exacerbates the seriousness of an emergency, placing the first responders and community at greater risk.

Proposed rail infrastructure, traffic calming, and pedestrian friendly street features will impact the HFD's ability to meet those standards. Additional vehicular traffic generated by commercial development will further aggravate the situation. The HFD must acquire additional personnel, equipment, and resources to meet this objective.

The HFD must find alternative funding sources to provide for additional personnel, equipment, and resources to serve the Kakaako community. We recommend that the HFD collaborate with the HCDA to establish and implement an impact fee to fund the HFD resources necessary to service the area's development. The proposed fee should not be less than $1,000 for each residential unit or $2.50 per square foot of commercial development over 10,000 square feet to ensure that the appropriate public safety costs are shared by the developers.

The HFD will also require compliance with the following provisions:

1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet from fire department access roads as measured by an approved route around the exterior of the building or facility.

   A fire department access road shall extend to within 50 feet of at least one exterior door that can be opened from the outside and that provides access to the interior of the building.

2. A water supply approved by the county, capable of supplying the required fire flow for fire protection, shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the

   required fire flow shall be provided when required by the authority having jurisdiction.

3. The unobstructed width and vertical clearance of a fire apparatus access road shall meet county requirements.

4. Submit civil drawings to the HFD for review and approval.

5. The above-mentioned provisions shall be subject to the current Fire Code of the City and County of Honolulu at the time of building plan submittal.

Should you have questions, please contact Assistant Chief Socrates Bratakos of our Support Services section at 723-7105 or sbratakos@honolulu.gov.

Sincerely,

MANUEL P. NEVES
Fire Chief

MPN/SB:jc

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
Governor

John Whalen
Chairperson

Anthony J. H. Ching
Executive Director

547 Queen Street
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96813

Telephone
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Facsimile
(808) 587-0299

E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Manuel P. Neves
Fire Chief
Honolulu Fire Department
City and County of Honolulu
636 South Street
Honolulu, Hawaii 96813-5007

Dear Chief Neves:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 2, 2015 commenting on the above document. Following are HCDA's responses to your comments in the order they were presented in your letter.

HCDA acknowledges your concurrence with the DEIS analysis of project impacts on first responders. As it moves forward with TOD, HCDA will strive to ensure that the introduction of the rail line in Kakaako, together with traffic-calming and pedestrian-friendly street features will not impede access by the Honolulu Fire Department. The matter of the impact fee proposed in your letter will be addressed at the time that rules are developed to implement the TOD Overlay Plan.

1. HCDA acknowledges the need for compliance with the 150-foot first-floor standard for HFD access to roadways and the 50-foot requirement for access to at least one exterior door.

2. HCDA acknowledges the requirements presented in your letter for the provision of adequate fire flow for fire protection.

3. HCDA acknowledges the requirement for unobstructed width and vertical clearance for fire apparatus.

4. As discussed in the DEIS, the initiative for new property development or redevelopment rests with property owners in the District. At the time that detailed development proposals are presented to the HCDA for review and approval, they will be submitted to the HFD for prior review and approval, as is presently the case.

5. HCDA acknowledges that all provisions are subject to the current Fire Code at the time of plan submittal.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

1611

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

RECEIVED
2015 FEB 6 AM 11 28
HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KIRK CALDWELL
MAYOR

MICHAEL D. FORMBY
DIRECTOR

MARK N. GARRITY, AICP
DEPUTY DIRECTOR

TP1/15-594040R

February 5, 2015

Mr. Anthony J.H. Ching
Executive Director
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Dear Mr. Ching:

SUBJECT: Draft Environmental Impact Statement for the Transit Oriented Development (TOD) Overlay Plan for the Kakaako Community Development District (KCDD)

This responds to your correspondence received on January 7, 2015, requesting our review of the subject project. Based on our review, we have the following comments to offer:

1. Based on the locations of the three KCDD rail stations and the high-density development of the TOD area, safe pedestrian, bicycle, and transit connections are essential.

2. The department supports the construction of workforce housing and mixed-use development in Kakaako.

3. The development of all properties and roadways in the KCDD should be consistent with the City's Complete Streets ordinance and include features to encourage walking, bicycling, and use of transit.

4. A Street Usage Permit from our department is required for work that may close any street, traffic lane, or sidewalk. Therefore, the list of permits in Section 0.8 Required Permits and Approvals, pg. 18, should include a Street Usage Permit from our department.

5. Please correct Section 2.3 Existing Traffic Operation, pg. 29: Level of Service at Bishop and King intersection during AM and PM peak hour are C and D, not E.

6. On Figure 4-14: Planned and Proposed Roadway Network Changes (Future Baseline Condition), pg. 93, portion of Queen Street (see attached) identified as a "New Roadway" should be corrected to an "Existing Roadway."

7. All affected Neighborhood Boards, as well as the area residents, businesses, etc. should be regularly apprised of the status of the plan and implementation actions.

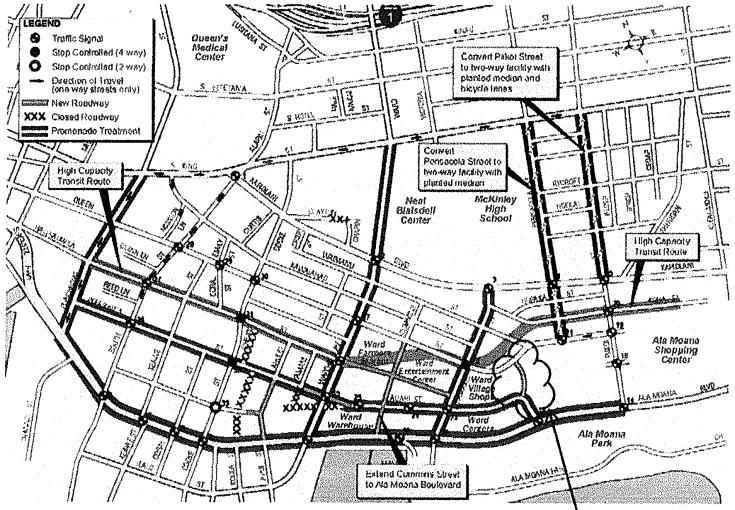
Thank you for the opportunity to review this matter. Should you have any questions, please contact Virginia Sosh of my staff at 768-5461.

Very truly yours,

Michael D. Formby
Director

Attachment

Figure 4-14: Planned and Proposed Roadway Network Changes (Future Baseline Condition)



This portion of Queen St. should be existing.

4.7.4.3 Year 2035 Traffic Operations Without The Propose

Year 2035 Baseline traffic volumes at each study intersection were estimated based on the anticipated net change in traffic volumes as determined by the OMPO model outputs. Forecast daily traffic volumes are summarized graphically in Figure 4-15. Forecast AM and PM Peak Hour volumes are presented in Figures 29 to 31 of the Traffic Study presented in Appendix D. A comparison of Existing PM peak hour traffic volumes and the forecast Future Baseline Condition PM peak hour traffic volumes yields the following findings:

- Traffic volumes at study intersections in the PM peak hour would be an average of 12 percent higher in the Future Baseline Condition alternative than under Existing Conditions.
- The largest increases in PM Peak Hour intersection volumes under the Future Baseline Condition would occur at the following five intersections, where the total 4-way approach volume is forecasted to increase by over 1,000 vehicles (representing an increase of over 30 percent at these locations):
  - Pensacola at Kapiolani
  - Ward at Kapiolani
  - Ward at Ahui

Sosh, Virginia Bisho

From: Uechi, Rika
Sent: Monday, January 26, 2015 3:05 PM
To: Sosh, Virginia Bisho
Subject: RE: TOD Overlay - Kakaako Community Development District - DRAFT response

Hi Ginny,

I don't think they finished reviewing...I haven't gotten the "OK" to send the email yet. I spoke with Jack, (he just came back to the office today) and he said that TE does NOT support converting Piikoi and Pensacola Streets into two-way roadway. He also mentioned that there was a request to convert one of the streets, if not both, into two-way in the past, and after the review and the investigation, the TE recommended NOT to convert to two-way. I have to look for the work order and see what the reasons were and will let you know.

Regards to Auahi Street, it looks like they'd like to realign Auahi Street, from around Marukai supermarket, to connect to Pohukaina Street. So it Auahi Street east of Ward Avenue won't be closed. Kamani Street is a private road, and I think Auahi Street, west of Ward Avenue is also privately owned.

If you have other questions, let me know.

Thanks!
Rika

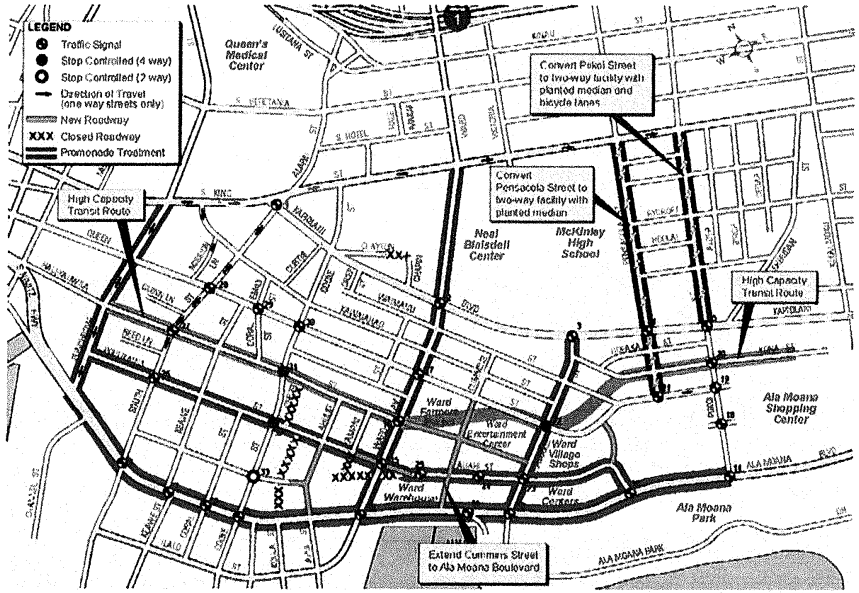
From: Sosh, Virginia Bisho
Sent: Monday, January 26, 2015 1:56 PM
To: Uechi, Rika
Subject: RE: TOD Overlay - Kakaako Community Development District - DRAFT response

Hi Rika,

I just wanted to check in and see if there was any word on if Mark/Craig had finished reviewing the document?

Also....one of the things I was curious about was if there would be any comments on the below figure (page 93 in the document) for the Planned/Proposed Roadway Network Changes.... Does TE support converting Piikoi Street and Pensacola into two way facilities w/ planted median and it looks like Auahi St. east of Ward Ave would be closed? ..... anyway....hopefully your Monday is going well....Thank you ..... Ginny

Figure 4-14: Planned and Proposed Roadway Network Changes (Future Baseline Condition)



Virginia C. H. Soeth
Department of Transportation Services
Transportation Planning Division
650 S. King Street 3rd Floor
Honolulu, Hawaii 96813
(808) 768 - 5461
vhsho@honolulu.gov

From: Uechi, Rika
Sent: Friday, January 23, 2015 8:37 AM
To: Soeth, Virginia Bisho
Subject: TOD Overlay - Kakaako Community Development District - DRAFT response

Hi Ginny,

Craig or Mark is still reviewing, but here's what we have so far.

1. The development of all properties and roadways in the subject area should be in compliance with the City's Complete Streets Ordinance.
2. The new proposed streets should improve the connectivity of the street network in the TOD area.
3. Section 2.3 Existing Traffic Operations, pg. 29: Level of Service at Bishop and King intersection during AM and PM peak hour are C and D, not E.

I will let you know as soon as they finish reviewing and if the comments need to be revised.

Thank you.
Rika

Rika Uechi
City and County of Honolulu
Department of Transportation Services
Traffic Engineering Division
ph. (808) 768-8341

Additional Recommended Improvement (non-mitigation)

A bicycle and pedestrian crossing improvement at the King Street/Cooke Street intersection. is recommended as a potential *future* improvement measure. This would help link cyclists between the project area/Civic Center HART station and the Ala'pai Transit Center/Young Street signed and marked bike route (an east-west connection). This improvement is not recommended as a mitigation measure in the DEIS due to the location of the improvement relative to the project area.

4.6 PEDESTRIAN IMPACTS

Recommended Pedestrian Network Changes (Draft TOD Overlay Plan)

The pedestrian recommendations in the Draft TOD Overlay Plan seek to develop a high-quality pedestrian environment in the project area in order to achieve the goals of a lively, active, and transit-oriented community. Figure 47 illustrates where pedestrian investment is recommended as the district develops and the Proposed Action is realized. These recommended improvements are not stipulated as part of the Proposed Action as described in the Project Description. Thus, the recommendations in the Draft TOD Overlay Plan are only strategies and are not required improvements. The following sections summarize the impacts created as part of the Proposed Action and provide more targeted mitigation measures tied to the stated impacts.

The pedestrian priority types recommended in the Draft TOD Overlay Plan include:

- **Primary pedestrian priority streets** are those that connect key destinations in or adjacent to the district, including HART rail stations, and that will ultimately support active street front uses such as retail stores, public plazas, and entertainment venues. These streets require spacious sidewalks and a high level of pedestrian amenity.
- **Secondary pedestrian priority streets** are those that do not provide direct connections to major destinations or have very high traffic volumes. While these streets may never be ideal for walking along for long distances, they must still be safe enough to accommodate walking, and they should be easy and safe enough to cross that they do not serve as a barrier to pedestrians.
- **Low speed streets** are generally service streets that may have narrow widths and where pedestrians and traffic may even be asked to mix on a shared right-of-way. Note that the term "low speed streets" should not be interpreted to suggest that high-speeds are promoted anywhere in the project area.
- **Greenway connections** are streets where there is opportunity to connect parks, greenspace, and public plazas with well-landscaped, shaded, and interesting walking routes.

Other pedestrian network changes recommended in the Draft TOD Overlay Plan relate to conflict reduction, sidewalk expansion, and crossing distance reduction. Any street with on-street parking is proposed to include curb extensions at intersections. Driveway consolidation is proposed throughout the project area to reduce conflicts between motor vehicles and pedestrians and improve pedestrian safety. Building access is concentrated at smaller parking access or service streets in order to reduce search-for-parking traffic and eliminate conflicts with pedestrians. In addition, 5 feet of additional setback is recommended to achieve minimum 15 feet sidewalk

Halekauwila Street

Although Halekauwila Street currently only accommodates up to 288 daily bicycle movements, this corridor will serve as a critical east-west bicycle connection. Given its alignment under the HART rail alignment, Halekauwila Street provides direct access to the future HART Civic Center, Kaka'ako, and Downtown Stations. Because this is a key transit access route, and there is a substantial projected increase in bicycle volumes between the Future Baseline Condition and Proposed Action (both due to demand for transit access and intra-district travel), Halekauwila Street's lack of dedicated bicycle facilities with a corresponding increase in bicycle volume between the Future Baseline Condition and Proposed Action contributes to a significant impact.

Finding: Potentially significant

Pensacola Street

Pensacola Street is a critical southbound bicycle connection at the Diamond Head edge of the project area. This corridor currently accommodates up to 288 daily bicycle movements. The projected increase in bicycle volumes along Pensacola Street between the Future Baseline Condition and Proposed Action is not supported by dedicated bicycle facilities. Pensacola Street is also a key bicycle access route to two future HART stations (Kaka'ako Station and Ala Moana Station), and Ala Moana Center for bicyclists originating from the Makiki neighborhood. Because this is a key transit access route, and there is a substantial projected increase in bicycle volumes between the Future Baseline Condition and Proposed Action (both due to demand for transit access and intra-district travel), Pensacola Street's lack of dedicated bicycle facilities is considered a significant impact.

The City and County has expressed interest in potentially converting the Pensacola-Piikoi one-way couplet into two-way operation while providing high quality bicycle facilities. This should be studied in the future.

Finding: Potentially significant

Piikoi Street

Piikoi Street is a critical northbound bicycle connection at the Diamond Head edge of the project area. This corridor currently accommodates up to 380 daily bicycle movements. Piikoi Street is anticipated to exhibit a 30% increase in motor vehicle turn volumes at Ala Moana Boulevard, which will increase bicycle exposure to turn conflicts. The projected increase in bicycle volumes along Piikoi Street between the Future Baseline Condition and Proposed Action is not supported by dedicated bicycle facilities. Piikoi Street is also provides bicycle egress from two future HART stations (Kaka'ako Station and Ala Moana Center, particularly for bicyclists destined for the Makiki neighborhood. Piikoi Street is anticipated to exhibit a 30% increase in motor vehicle turn volumes at Ala Moana Boulevard, which will increase bicycle exposure to turn conflicts. Because this is a key transit egress route, and there is a substantial projected increase in bicycle volumes between the Future Baseline Condition and Proposed Action (both due to demand for transit access and intra-district travel), Piikoi Street's lack of dedicated bicycle facilities is considered a significant impact.

The City and County has expressed interest in potentially converting the Pensacola-Piikoi one-way couplet into two-way operation while providing high quality bicycle facilities. This should be studied in the future.

Finding: Potentially significant

HAWAII COMMUNITY
DEVELOPMENT AUTHORITY

KAKAAKO
KALAEOA

David Y. Ige
Governor

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Chairperson

Anthony J. H. Ching
Executive Director

547 Queen Street
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E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Michael Formby, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Dear Mr. Formby:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 5, 2015 commenting on the above document. Following are HCDA's responses to your comments in the order they were presented in your letter.

1. HCDA concurs with your expressed need for safe pedestrian, bicycle, and transit connections in the District.

2. We are pleased that the DTS supports the provision of workforce housing and mixed-use development in the District.

3. HCDA is committed to implementing the City's Complete Streets ordinance in the District.

4. Acknowledged. The Tables in Section 0.8 of the Executive Summary and Section 2.5 of Chapter Two have been revised to include reference to a Street Usage Permit.

5. The reference to Level of Service for the Bishop Street/King Street intersection has been corrected on page 85 of Chapter Four (Section 4.7.3.3, Table 4-9).

6. The map was developed as part of the Kakaako Mauka Area Plan Supplemental EIS Transportation Analysis, April 14, 2009, and was included in the Draft EIS for the TOD Overlay Plan as a way to illustrate previous plans for the District as part of the Future Baseline Condition. As such, the base map cannot be modified. However, we will include an annotation on top of the map to indicate the street as "Existing".

7. Acknowledged.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DANIEL S. QUINN
INTERIM FIRST DEPUTY

W. ROY HARDY
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 19, 2015

Hawaii Community Development Authority
Attn: Ms. Amy Mutart via email: Amy.Mutart@hcdaweb.org
461 Cooke Street
Honolulu, Hawaii 96813

Dear Ms. Mutart,

SUBJECT: Draft Environmental Impact Statement, Transit-Oriented Development (TOD) Overlay Plan for the Kaka`ako Community Development District (KCDD)

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from (1) Land Division – Oahu District; (2) Office of Conservation and Coastal Lands; and (3) Engineering Division. No other comments were received as of our suspense date. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at 587-0439. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

c: Lee Sichter LLC via email: leesichter@gmail.com

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
ACTING CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
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KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 12, 2015

MEMORANDUM

TO: **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Impact Statement, Transit-Oriented Development (TOD) Overlay Plan for the Kaka`ako Community Development District (KCDD)
LOCATION: Honolulu (Primary Urban Center), O`ahu; Tax Map Keys: Various in Aloha Tower Special District and Kaka`ako; see DEIS;
APPLICANT: Hawaii Community Development Authority by its consultant Lee Sichter LLC

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments. Click on the subject file "Draft Environmental Impact Statement, Transit-Oriented Development (TOD) Overlay Plan for the Kaka`ako Community Development District (KCDD)", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Jonathan Real, Applications/Systems Analyst at 587-0427 or Jonathan.C.Real@hawaii.gov)

Please submit any comments by February 18, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: Tchee
Print Name: Timothy Chee
Date: 1/23/15

OA-15-118 Discuss

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
ACTING CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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KAHOOLAWE ISLAND RESERVE COMMISSION
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STATE PARKS

2015 JAN 13 A

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 12, 2015

MEMORANDUM

TO: **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

Discuss

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Impact Statement, Transit-Oriented Development (TOD) Overlay Plan for the Kaka`ako Community Development District (KCDD)
LOCATION: Honolulu (Primary Urban Center), O`ahu; Tax Map Keys: Various in Aloha Tower Special District and Kaka`ako; see DEIS;
APPLICANT: Hawaii Community Development Authority by its consultant Lee Sichter LLC

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments. Click on the subject file "Draft Environmental Impact Statement, Transit-Oriented Development (TOD) Overlay Plan for the Kaka`ako Community Development District (KCDD)", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Jonathan Real, Applications/Systems Analyst at 587-0427 or Jonathan.C.Real@hawaii.gov)

Please submit any comments by February 18, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed: SAM LEMMO
Print Name: SAM LEMMO
Date: 1-28-2015

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
ACTING CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

COR: OCCL: AJR

COR: OA-15-118
JAN 28 2015

HCDA
461 Cooke Street
Honolulu, HI 96813

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS), KAKA'AKO COMMUNITY DEVELOPMENT DISTRICT (KCDD)
Honolulu District, Island of Oahu
TMK: Various in: Aloha Tower Special District & Kaka'ako

To whom it may concern,

We are in receipt of your request for comments dated *January 12, 2015*, regarding the Draft Environmental Impact Statement (DEIS) for the proposed Transit Oriented Development (TOD) Overlay Plan for the *Kaka'ako Community Development District* (KCDD).

The Office of Conservation and Coastal Lands (OCCL) has reviewed your DEIS and would like to recognize and acknowledge your commitment to addressing potential long- and short-term influences on the proposed project in regard to Global Climate Change and subsequent Sea Level Rise. This is especially relevant for the development of low-lying areas such as Kaka'ako.

Act 83 (*HB 1714*), or the *Hawaii Climate Adaptation Initiative Act*, aims to address the potential effects of Global Climate Change and Sea Level Rise on Hawaii's existing and future infrastructure, environmental resource management, and development. At this time the OCCL and the Office of Planning (OP) are coordinating the development of a State-wide *Sea Level Rise Vulnerability and Adaptation* report that will provide guidance for future development projects; therefore we would appreciate a continued involvement in the planning process.

If you have any questions regarding this correspondence please contact Alex J. Roy, M.Sc. of our Office of Conservation and Coastal Lands staff at 808-587-0316.

Sincerely,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

DAVID Y. IGE
GOVERNOR OF HAWAII

CARTY S. CHANG
ACTING CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
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LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 12, 2015

'15 JAN 12 PM02:02 ENGINEERING

MEMORANDUM

TO: PR:

DLNR Agencies:
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

FROM: TO: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Impact Statement, Transit-Oriented Development (TOD) Overlay Plan for the Kaka`ako Community Development District (KCDD)
LOCATION: Honolulu (Primary Urban Center), O`ahu; Tax Map Keys: Various in Aloha Tower Special District and Kaka`ako; see DEIS;
APPLICANT: Hawaii Community Development Authority by its consultant Lee Sichter LLC

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document which can be found here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments. Click on the subject file "Draft Environmental Impact Statement, Transit-Oriented Development (TOD) Overlay Plan for the Kaka`ako Community Development District (KCDD)", then click on "Files" and "Download a copy". (Any issues accessing the document should be directed to Jonathan Real, Applications/Systems Analyst at 587-0427 or Jonathan.C.Real@hawaii.gov)

Please submit any comments by February 18, 2015. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments
( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: Chris Takeshige
Print Name: Carty S. Chang, Chief Engineer
Date: 2/17/15

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/ Russell Y. Tsuji
REF: DEIS for Transit-Oriented Development Overlay Plan for Kaka'ako Community Development District
Oahu.003

COMMENTS

(X) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zones AE, VE, and X. The National Flood Insurance Program regulates developments within Zones AE and VE as indicated in bold letters below, but not in Zone X.
( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is also located in Zone ____.
( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.
(X) Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:
(X) Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
( ) Ms. Carolyn Cortez at (808) 270-7253 of the County of Maui, Department of Planning.
( ) Mr. Stanford Iwamoto at (808) 241-4896 of the County of Kauai, Department of Public Works.

(X) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

(X) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

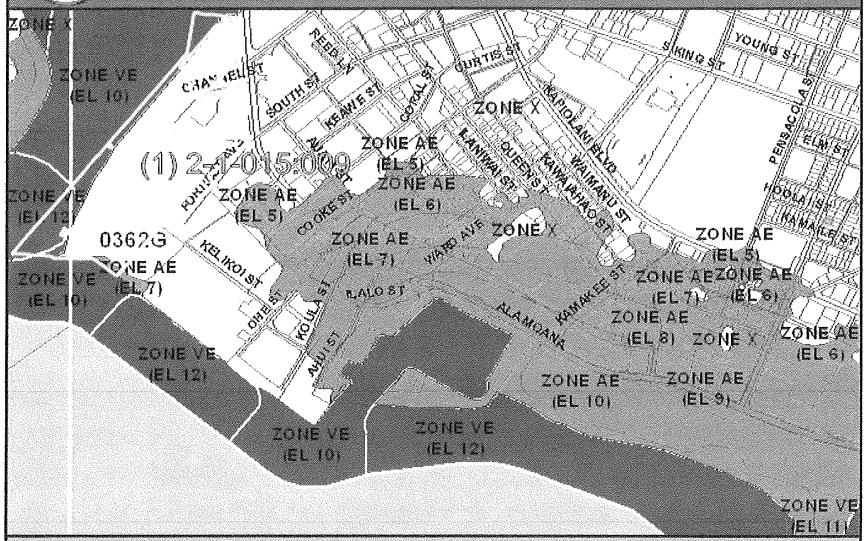
( ) Other: _____

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: Chris Takeshige
CARTY S. CHANG, CHIEF ENGINEER
Date: 2/17/15

State of Hawaii

FLOOD HAZARD ASSESSMENT REPORT



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD ZONE DEFINITIONS

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD – The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water-surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

- **Zone A:** No BFE determined.
- **Zone AE:** BFE determined.
- **Zone AH:** Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- **Zone AO:** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- **Zone V:** Coastal flood zone with velocity hazard (wave action); no BFE determined.
- **Zone VE:** Coastal flood zone with velocity hazard (wave action); BFE determined.
- **Zone AEF:** Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA – An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- **Zone XS (X shaded):** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- **Zone X:** Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- **Zone D:** Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

PROPERTY INFORMATION

COUNTY:	HONOLULU
TMK NO:	(1) 2-1-015-009
PARCEL ADDRESS:	
FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL(S):	15003C0361G-JANUARY 19, 2011 15003C0362G-JANUARY 19, 2011
PARCEL DATA FROM:	APRIL 2014
IMAGERY DATA FROM:	MAY 2006

IMPORTANT PHONE NUMBERS

County NFIP Coordinator	
City and County of Honolulu	
Mario Siu-Li, CFM	(808) 768-8098
State NFIP Coordinator	
Carol Tyau-Beam, P.E., CFM	(808) 587-0267

Disclaimer: The Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use of the information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR from any liability, which may arise from its use.

If this map has been identified as 'PRELIMINARY' or 'UNOFFICIAL', please note that it is being provided for informational purposes and is not to be used for official/legal decisions, regulatory compliance, or flood insurance rating. Contact your county NFIP coordinator for flood zone determinations to be used for compliance with local floodplain management regulations.

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
Governor

John Whalen
Chairperson

Anthony J. H. Ching
Executive Director

547 Queen Street
Honolulu, Hawaii
96813

Telephone
(808) 594-0300

Facsimile
(808) 587-0299

E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Russell Y. Tsuji
Land Administrator, Land Division
Department of Land and Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Tsuji:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter that was received by HCDA on February 19, 2015 commenting on the above document. Following are our responses to your comments in the order they were presented.

We note that the Land Division has no comments.

We received the comments from the Office of Conservation and Coastal Lands in a separate letter dated January 30, 2015. The letter from OCCL you enclosed is a duplicate. Our response to the original letter is as follows:

"Mahalo for your expression of support for our efforts regarding global climate change and sea level rise. We look forward to the completion of your report on sea level rise and adaptation and to your involvement in the planning process."

Our responses to comments from the Engineering Division follow:

1. We acknowledge your confirmation of the KCDD's flood zone designations.

2. HCDA acknowledges the requirement that developments comply with the rules and regulations of the National Flood Protection Program.

3. The potable water demands of the project are presented on page 233 of Chapter Four. Section 4.11.1.2 of Chapter Four presents the infrastructure requirements needed to address projected potable water demand. HCDA acknowledges the need for projects that require new water service to obtain water allocation credits from the Engineering Division before Building Permits and/or a water meter is approved.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN

RECEIVED
2015 FEB 17 PM 12 04
HAWAII COMMUNITY DEVELOPMENT AUTHORITY

IN REPLY REFER TO:
AIR-EP
15.0013

February 11, 2015

Mr. Anthony J.H. Ching
Executive Director
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Dear Mr. Ching:

Subject: Kakaako Community Transit Oriented Development Overlay Plan
Draft Environmental Impact Statement (DEIS)

We have reviewed the subject DEIS and have the following comments:

- The entire Kakaako Transit Oriented Development (TOD) Overlay Plan falls within the airspace of Honolulu International Airport and is a major concern for aircraft departing the Airport.
- Of particular concern to Airports Division is TOD Alternative A, where building forms could rise to 700 feet with an option for a cluster of 420-550 feet tall high-rise towers. Any structure that is more than 400 feet high is a major concern for the airlines in this area, due to the one-engine inoperative (OEI) emergency procedure for commercial aircraft. The airlines currently adjust their load factor to take into account the OEI procedure for each aircraft. However, due to the cumulative impact of the number of buildings and the height of the towers being proposed, this OEI procedure becomes more challenging for the airlines and could result in a huge economic loss for the airlines as well as the State. This OEI procedure needs to be examined further and taken into account in terms of the height and location of the buildings by consulting with the airlines.
- The Airports Division strongly recommends to the Hawaii Community Development Authority (HCDA) that the height limit be under 400 feet within the Pauahi and Auahi designated areas in the Kakaako Community TOD Overlay Plan.
- The developer is required to file Federal Aviation Administration (FAA) Form 7460-1, "Notice of Proposed Construction or Alteration" on a case by case basis. This form can be filed online at https://oeaaa.faa.gov/oeaaaexternal/portal.jsp.
- The developer, in addition to filing FAA Form 7460-1 with the FAA, will need to submit their proposals to the Airports Division for review and comment.
- This FAA Form 7460-1 should also be included in the list of "Required Permits and Approvals" in Section 2.5 on page 39.

Should you have any questions regarding the above, please contact Mr. Roy Sakata, Oahu District Manager, at (808)836-6533.

Sincerely,

ROSS M. HIGASHI
Deputy Director – Airports

c: Mr. Gordon Wong, Federal Aviation Administration
Airlines Committee of Hawaii
DIR
STP

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
Governor

John Whalen
Chairperson

Anthony J. H. Ching
Executive Director

547 Queen Street
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Facsimile
(808) 587-0299

E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Ross M. Higashi
Deputy Director – Airports
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Higashi:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 11, 2015 commenting on the above document. Following are responses to your comments in the order they were presented in your letter.

1. We acknowledge that the TOD Overlay Plan Area is located within airspace of the Honolulu International Airport.

2. We acknowledge your advisory concerning one-engine inoperative engine procedures.

3. In 2014, the State Legislature adopted a height limit for Kakaako of 418 feet (including allowances for appurtenant structures atop buildings such as elevator machinery etc.). Thus, Alternative A cannot be implemented unless the State Legislature rescinds its previous legislation.

4. Please be advised that we received a comment letter from the FAA on January 19, 2015. HCDA acknowledges that the filing of Form 7460-1 is conducted on a case-by-case basis and has acknowledged that requirement to the FAA as well.

5. As HCDA receives development applications from individual landowners, they will be submitted to the Airports Division for review.

6. We have included FAA Form 7460-1 in the FEIS' list of Required Permits and Approvals.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

The Howard Hughes Corporation
Victoria Ward, Limited
1240 Ala Moana Blvd.
Suite 200
Honolulu, HI 96814

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F 808.596.4919
www.howardhughes.com

RECEIVED
2015 FEB 20 AM 9 22
HAWAII COMMUNITY
DEVELOPMENT
AUTHORITY

February 20, 2015

Ms. Amy Mutart, Project Manager
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Subject: Draft Environmental Impact Statement ("DEIS") for the Kaka'ako Community Development District Draft Transit-Oriented Development Overlay Plan

Thank you for the opportunity to review and comment on the DEIS for the Kaka'ako Community Development District ("KCDD") Draft Transit-Oriented Development Overlay Plan (the "Draft TOD Overlay Plan"). Victoria Ward Limited ("VWL"), by and through its affiliate, The Howard Hughes Corporation ("Howard Hughes"), respectfully submits its comments regarding the DEIS for the Draft TOD Overlay Plan for your consideration and incorporation into analysis of impacts at KCDD.

As explained in a previous letter to Mr. Anthony Ching, Executive Director, Hawaii Community Development Authority ("HCDA") dated September 3, 2014, a copy of which is enclosed, it is our understanding that the HCDA, in preparing a DEIS for the Draft TOD Overlay Plan, would include the improvements listed below. Notwithstanding the foregoing, it appears that several of the improvements (as identified below) were not addressed.

1. Narrowing of Auahi Street from 4 lanes of travel to 2 lanes of travel: The DEIS does not address this improvement.

2. Road widening along Queen Street and intersection improvements at Queen Street and Kamake'e Street: The DEIS does not address this improvement.

3. Removal of the Cummins Street extension: The DEIS does not address this improvement. In contrast, Figure 4-4: Planned and Proposed Roadway Network Changes (Future Baseline Condition) depicts the extension of Cummins Street to Ala Moana Boulevard.

4. Alternative for preserving the Auahi Street east-west connection in lieu of the Pohukaina Street re-alignment: The Draft TOD Overlay Plan indicates in relevant part that:

> The proposed connection of Auahi to Pohukaina as part of the Howard Hughes development presents an opportunity to create a pedestrian-oriented commercial street. This street would provide a

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secondary bicycle connection allowing local bike traffic to access retail and services from this corridor. A standard sharrow treatment and bicycle wayfinding signage would be appropriate for this corridor.

See Exhibit A to the DEIS for the Draft TOD Overlay Plan, which is a copy of the Draft TOD Overlay Plan, at Section 5-56 to 5-57. Nevertheless, the DEIS does not address this improvement.

5. Addition of bike lanes and/or shared paths along Auahi Street, Kamake'e Street, Halekauwila Street, Ward Avenue, and other streets within Ward Village: VWL is pleased to note that potential changes to the roadway network under the Proposed Action described in TOD Alternative A include, in relevant part, the designation of primary (separated) and/or shared bicycle paths on Auahi, Kamake'e Street, Halekauwila Street, Ward Avenue, and other streets within Ward Village. See DEIS, Chapter 4, Figure 4-19: Proposed Bicycle Priority Streets – Proposed Actions; see also DEIS, Chapter 4, Section 4.7.8.1.

6. Traffic improvements throughout Ward Village as discussed and identified in the Traffic Impact Report for Victoria Ward Development Phase 2 (June 2014). The DEIS does not address these improvements.

7. Related miscellaneous improvements at various roadway intersections in the region to include, but not limited to, intersection traffic signalization and modifications, left-turn lane, auxiliary lane, lane configuration, pedestrian ways, bikeways and other types of intersection control: Several miscellaneous improvements at various roadway intersections in the KCDD are included in the Draft TOD Overlay Plan at Sections 5-16, 5-17, 5-25 to 5-33, 5-56 to 5-57, 6-30, 7-10 to 7-14. In addition, Section 3.6 of the Transportation Analysis attached as Appendix "D" to the DEIS, relating to the Future Baseline Condition, includes intersection improvements.

8. Raising of Auahi Street by approximately 3' between Ward Avenue and Kamake'e Street with the appropriate slopes to account for transitions and drainage: The DEIS does not address this improvement.

9. Addition of sewer mains in Ward Avenue, Auahi Street, Kamake'e Street, Queen Street and future Halekauwila Street extension: VWL notes that the Future Baseline and TOD Alternative A scenarios included the following improvements:

- Install a 24" relief sewer in Ward Avenue between Ilaniwai and Auahi Streets;
- Reroute the 48" trunk sewer from the Ross Dress for Less and Sports Authority stores into Ward Avenue;
- Replace the 6" sewers in Pohukaina Street between Koula and Ward Avenue with 12" sewers;

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- Install a 36" sewer in Auahi Street between Kamakee Street and Ward Avenue; and
- Replace the 8" sewer in Auahi Street between Kamakee Street and Queen Lane with a 12" sewer.

See DEIS, Chapter 4, Section 4.11.2.2, at pages 242-243.

10. Relocation of the existing East End 48-inch sewer main along Queen Street, Ward Avenue, and Auahi Street: The DEIS does not address this improvement.

11. Relocation of 2 existing box culvert crossings on Auahi Street: The DEIS does not address this improvement.

12. 12-inch waterline along Queen Street from Cooke Street to the existing 12-inch main located between Cummins and Kamake'e Streets: VWL notes that the DEIS included this improvement in evaluating future development scenarios. See DEIS, Chapter 4, Section 4.11.1.2, at pages 233-234.

13. Undergrounding of electrical, communication, and cable system along Auahi Street: The DEIS does not address the undergrounding of electrical, communication, and cable system along Auahi Street, specifically. However, the DEIS includes undergrounding, generally, within the KCDD. See DEIS, Chapter 4, Sections 4.11.5.2 and 4.11.7.2.

14. Addition of electrical, communication, and cable system along Ilaniwai Street, Halekauwila Street, Pohukaina Street re-alignment, and Halekauwila Street extension: See comments immediately above in paragraph 10.

VWL is concerned that the DEIS did not address several improvements identified above, which have been clearly contemplated and planned during the next few years as VWL implements the Ward Neighborhood Master Plan. We are concerned that the DEIS has not addressed the necessary cumulative impacts. The impacts related to these improvements, which are near term in timing, should be considered in the DEIS.

VWL appreciates the opportunity to participate in this planning process and to offer comments. Please feel free to contact me should you have any questions regarding the above comments.

Sincerely,

VICTORIA WARD, LIMITED

Nicholas D. Vanderboom
Senior Vice President
The Howard Hughes Corporation

The Howard Hughes Corporation
1240 Ala Moana Boulevard
Suite 200
Honolulu, Hawaii 96814

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Enclosure

cc: Lee Sichter, Lee Sichter LLC, 45024 Malulani Street #1, Kane'ohe, Hawaii 96744
The Honorable David Y. Ige, Governor of Hawaii, Office of the Governor, Executive Chambers, Hawaii State Capitol, Honolulu, HI 96813
Jessica Wooley, Director, Office of Environmental Quality Control, Department of Health, State of Hawaii, 235 South Beretania Street, Room 702, Honolulu, Hawaii 96813
Anthony J. H. Ching, Executive Director, Hawaii Community Development Authority (via e-mail only)
Deepak Neupane, P.E., AIA, Hawaii Community Development Authority (via e-mail only)

497729.5

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
Governor

John Whalen
Chairperson

Anthony J. H. Ching
Executive Director

547 Queen Street
Honolulu, Hawaii
96813

Telephone
(808) 594-0300

Facsimile
(808) 587-0299

E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Nicholas D. Vanderboom
Senior Vice President
The Howard Hughes Corporation
Victoria Ward, Limited
1240 Ala Moana Boulevard, Suite 200
Honolulu, Hawaii 96814

Dear Mr. Vanderboom:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 20, 2015 commenting on the above document.

The purpose of the EIS is to identify the impact of the TOD Overlay Plan when implemented in the Mauka Area of the KCDD. As discussed in the EIS, the Ward Neighborhood Master Plan has been previously approved by the HCDA and is, therefore, considered to be part of the Future Baseline Condition. Most of the improvements identified in your letter appear to be improvements necessary to implement the Ward Neighborhood Master Plan. As such, they are outside the scope of the Draft TOD Overlay Plan and its corresponding EIS. As a programmatic-level effort, the EIS is not intended to address the potential development actions of a single landowner. If any of the improvements proposed by The Howard Hughes Corporation in implementing the Ward Neighborhood Master Plan has requirement to comply with the provisions of Chapter 343, Hawaii Revised Statutes, that obligation rests with The Howard Hughes Corporation.

Additionally, we provide the following response to your comment #3, and #4.

1. Extension of Cummings Street to Ala Moana Boulevard is not a new addition in the TOD Overlay Plan but a continuation of proposed connection established in the Mauka Area Plan and Rules. The Howard Hughes Corporation may request plan and

rule amendment to address Cummings Street extension. The process of requesting plan and rule amendment is provided in Hawaii Administrative Rules, Sections 15-219-67 through 15-219-72.

2. Extension of Pohukaina Street to Auahi Street is not a new proposal in the TOD Overlay Plan but a continuation of proposed extension established in the Mauka Area Plan and Rules.. The Howard Hughes Corporation may request plan and rule amendment to address Pohukaina Street extension. The process of requesting plan and rule amendment is provided in Hawaii Administrative Rules, Sections 15-219-67 through 15-219-72.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

SERVCO PACIFIC INC
2850 Puuloa Street • Suite 300 • Honolulu, Hawaii 96819 • Telephone (808) 564 1300 • Facsimile (808) 523-3937 • www.servco.com

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HAWAII COMMUNITY DEVELOPMENT AUTHORITY

February 23, 2015

Via Email (deepak@hcdaweb.org) and Hand Delivery by HonBlue

Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Attention: Deepak Neupane, P.E., AIA

RE: Draft Environmental Impact Statement Kaka`ako Community Development District – Transit Oriented Development Overlay Plan dated January 8, 2015

Dear Mr. Neupane:

Servco Pacific Inc. ("***Servco***") is the current owner of the real property located at (a) 609 South Street on which it maintains its Motor Imports Parts and Service facility serving Toyota, Scion and Suzuki automobiles (the "***Servco South Street Property***"), and (b) 650 Kapiolani Boulevard on which it maintains its Lexus dealership and service department, and 645 Kapiolani Boulevard on which it maintains its pre-owned Lexus and used vehicle dealership (collectively, the "***Servco Kapiolani Property***"). The Servco South Street Property and the Servco Kapiolani Property will be directly impacted by the proposed Transit Oriented Development Overlay Plan for Kakaako (the "***TOD Overlay Plan***") as described and set forth in the Draft Environmental Impact Statement for Kaka`ako Community Development District - Transit Oriented Development Overlay Plan dated January 8, 2015 (the "***Draft 2015 EIS - Kakaako TOD Overlay Plan***").

Based on its review of the Draft 2015 EIS - Kakaako TOD Overlay Plan, Servco has certain concerns relating thereto and has set forth below the follow comments for consideration:

1. September 2013 Letter. In response to the early 2013 Draft Kakaako TOD Overlay Plan, Servco submitted a comment letter dated September 17, 2013 (the "***September 2013 Letter***"), a copy of which is attached as part of the Written Comments Section, and Hawaii Community Development Authority ("***HCDA***") responded to those comments by letter dated January 24, 2014, a copy of which is also attached as part of the Written Comments Section. A number of the responsive comments were "Your comment ... is noted" or "Your recommendation ... is noted". Servco does not feel those are appropriate responses and requests clarification and an affirmative response as to how HCDA intends to address those comments under the proposed TOD Overlay Plan.

2. Opt Into TOD Overlay Plan. While Servco realizes that as a result of Act 61 (limiting building heights in Kakaako) there are two (2) alternative TOD Overlay Plans identified as "TOD Alternative A" and "TOD Alternative B", Servco still finds it unclear as to the process by which a landowner opts into the TOD Overlay Plan. Servco understands that the final TOD Overlay Plan is still not intended to be mandatory as to the affected Kakaako lands, but rather will contain a mechanism by which the landowner may opt in, but only if the landowner so chooses. Furthermore Servco understands that a landowner will not be allowed to pick and choose between the Kaka`ako District Mauka Area Rules and the TOD Overlay Plan. Servco

feels that the non-mandatory nature of this opt in mechanism should be clarified and that it should be clearly and expressly stated that the TOD Overlay Plan is not mandatory as to the affected lands, and the landowner/developer cannot pick and choose, but must affirmatively elect to follow either the TOD Overlay Plan or the Kaka`ako District Mauka Area Rules. A combination of both cannot be used for development of any site in the Kakaako District. Servco also continues to recommend that the TOD Overlay Plan clarify whether this election is a one-time only decision by the landowner or when it next seeks to redevelop its land after adoption of the TOD Overlay Plan, or if a subsequent redevelopment of the parcel would allow for a separate opt in election / option.

3. Infrastructure: Please clarify if the intention under the TOD Overlay Plan is to make special improvement assessments against individual and benefitted Kakaako landowners for the cost of street modifications, upgrading water, drainage and sewer capacity. If so what is the percentage of such costs which will be borne by the individual landowners? Will the TOD Overlay Plan simply adopt and incorporate the District Wide Improvement provisions under the Kaka`ako District Mauka Area Rules or is the intention to have separate modified rules to reflect the increased development density?

4. Parking: Throughout the Draft 2015 EIS – Kakaako TOD Overlay Plan, there are references to a drop in the ratio of parking spaces desired per unit. How has or will this reduction be determined? If a survey was conducted, who was surveyed? There is also reference to the removal of on-street parking from certain streets. Has appropriate consideration been given to the potential negative impact this will have on the various Kakaako businesses who depend on the use of on-street parking by their customers?

5. Figures/Tables: It is very difficult to read the street names, which are often too small or too light in contrast. This is important as it provides the reader with a point of reference when reviewing the figure/table. Also, the legend for various figures/tables is often unclear or again, the contrast is poor. This may be the result of attempting to downsize a large map or figure to 8-1/2 x 11 inch size. Servco recommends some link to a larger size version that the reader may access and/or download.

6. New Transit Plaza Associated with the Civic Center Station: There are references to integrating a new transit plaza associated with the Civic Center Station adjacent to the Servco South Street Property. (See for example Page 5, 20 and 310.) It is unclear where this transit plaza is intended to be located and who will be constructing the new transit plaza – HCDA, HART or a private entity/developer? If this is part of the requirements for the proposed Stanford Carr development on the property makai of the Servco South Street Property, it should be so stated. In Servco's September 2013 Letter it stated a concern that a reader might presume that a transit plaza must be developed for the Civic Center Station. If that is not the case it should be clearly stated that references to a transit plaza associated with the Civic Center Station are only for illustrative purposes, and will not be a governmental requirement with respect to the Civic Center Station.

7. Page 15, *Traffic*, Bullet 4: It should be clarified as to how an "industrial street" is to be defined or to clearly define it in the text.

8. Page 15, *Social*, Bullet 1: It should be explained as to what type of revision is being considered to the existing reserved housing program and how in the context of the TOD Overlay Plan this will lead to an to increase in the amount of affordable housing in the District. Is there a time schedule to develop and implement this revised and expanded reserved housing program? This is an important component to be considered by any landowner contemplating redevelopment within the Kakaako District under the TOD Overlay Plan.

9. Page 55, Table 4-3 Newly Identified Cultural Resources; Page 65: There should be an explanation or example as to how the future development and use by the landowners of the properties on which places/businesses are listed on this table will be affected or impacted by this designation. As an example, item 33 is Fresh Café and Loft in Space. There is no explanation or guideline provided as to how this business was selected for inclusion as part of a distinct cultural group. If this designation is made, will the landowner have the right to use the property for another purpose or will there be some approval or financial penalty for doing so? How should a comment (page 65) such as "One mitigation measure may be to encourage lessors to offer adjusted rent spaces for these and similar institutions" impact the landowner? The overall TOD Overlay Plan appears to be based on a plan to incentivize certain desired types of development within the TOD areas, and in that context wouldn't this designation be viewed as a negative incentive?

10. Page 132, Traffic and Rail Noise: This particular bullet point ends with the sentence "the use of 3-foot high sidewalls seemed to be included in the current design". What assurance does Servco and the public have that these 3-foot high sidewalls will be included in the current design to mitigate the noise? What evidence can be provided that it provides worthwhile mitigation of the contemplated rail noise?

11. Service Streets – 650 Kapiolani / South Street: In Servco's September 2013 Letter, Servco requested clarification of a service street between Servco's 650 Kapiolani Property and the adjacent One Kapiolani building property. However, at that time Servco did not mention its concern about another proposed service street which appears to be located on the mauka side of the Servco South Street Property and the adjacent property (Page 30, Figure 2-7 Current KCDD Street Grid and Potential Future Connections). Servco would also like this concern addressed at this time. Servco does not understand how HCDA could make a unilateral decision as purportedly shown in this Figure to place a service street between two properties, without consultation with the affected landowners. Servco requests that HCDA identity from which property it is intended that a taking will occur in order to create the service street as shown.

12. Treatment of Developable Floor Area from Property Acquire by HART: Servco made a general comment in its September 2013 Letter on the 2013 Draft Kakaako TOD Overlay Plan that the TOD Overlay Plan should state the manner in which HCDA will handle the floor area attributable to the land areas being acquired within the Kakaako District by the City/HART for its rail project. As a result of HART identifying a portion of the Servco South Street Property for acquisition in connection with the planned rail project this is a very real issue/concern for Servco and, in Servco's view, any other landowner within the Kakaako District facing a similar situation. Servco continues to believe that it would be appropriate for the TOD Overlay Plan to include a provision which provides that if the City/HART agrees as part of its acquisition of

private lands for its rail project in the Kakaako District that the floor area for development purposes attributable to the land areas so acquired by the City for its rail project will remain with and be usable by the landowner whose land was so taken, and that HCDA will accept and recognize the retention of such floor area.

Servco requests confirmation of the manner in which it will receive responses to its comments set forth above, and also how HCDA intends to keep the greater Kakaako community informed of its responses to all comments and/or questions provided during the public comment period on the Draft 2015 EIS - Kakaako TOD Overlay Plan.

Finally, Servco requests information regarding the current projected timetable for HCDA to (a) issue a Final EIS – Kakaako TOD Overlay Plan, (b) finalize its selection of TOD Alternative A or TOD Alternative B, and (c) adopt final rules for implementing the TOD Overlay Plan. Servco feels it is important for all Kakaako landowners to have a realistic idea as to when these contemplated changes to the manner in which development within the affected areas of Kakaako will be handled will be a reality. It will impact near term business planning within the Kakaako District.

If you have any questions or would like to meet with us to discuss our comments and concerns, please feel free to contact Karen Shimizu at 564-1399 or myself at 564-1344. Thank you.

Sincerely,

SERVCO PACIFIC INC.

Carol K. Lam

Carol K. Lam (B)
Senior Vice President

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
Governor

John Whalen
Chairperson

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Web site
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Ref. No.: PL TOD 18.3

June 10, 2015

Ms. Carol K. Lam, Senior Vice President
Servco Pacific Inc.
2850 Pukoloa Street, Suite 300
Honolulu, Hawaii 96819

Dear Ms. Lam:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 23, 2015 commenting on the above document. Following are responses to your comments in the order they were presented in your letter.

1. We regret that you do not feel that some of HCDA's responses to your September 2013 letter regarding the Draft TOD Overlay Plan were "appropriate". Of the 25 comments presented in the letter, twenty of HCDA's responses were detailed. Five responses were briefer. Your comment #3 expressed a concern about a figure being misinterpreted and we responded that an appropriate disclosure would be provided. Your comment #10 recommends the inclusion of a legend for the colors used in Figure 3-5 of the TOD Overlay Plan. HCDA is, in fact, considering whether such a legend will be added to the figure. Your comment #18 requests that specific language be added to Figure 7-13 of the TOD Overlay Plan to clarify that it is merely an illustration. HCDA decided to wait to see if any others had difficulty in interpreting the meaning of the figure before deciding whether any changes were warranted. No other comments were received. At this point in time, no revisions are anticipated. Your comment #19 expresses a concern that the recommendation might extend to others beside those who opt into the TOD Overlay Plan. That is not HCDA's intent. And finally, your comment #21 expresses your belief that the recommendation does not make any sense. As is the case with your comment #18, HCDA has waited to

see if any other parties have expressed a similar concern. To date, they have not. HCDA has not yet determined whether Rule Change PT3.1 will be included in the Final TOD Overlay Plan.

2. You raise a valid concern that will be addressed during final rule making for the TOD Overlay Plan.

3. A determination regarding the assessment of infrastructure improvement fees has not yet been made. Once the EIS process has been concluded, the proposed rules to implement the TOD Overlay Plan will be reviewed for finalization. Infrastructure improvements will be most likely implemented as district wide improvement projects as provided for in Hawaii Revised Statutes §206E-6. The HCDA is required to adopt rules for implementing district wide improvements and your concern will be addressed at that time.

4. No parking survey has been conducted. The Draft TOD Overlay Plan presents a generalized desired outcome for parking. Once the EIS review process has been completed, the Draft TOD Plan will be finalized, and at that time, all comments received regarding it will be addressed and potential rule changes will be reviewed and adjusted, if needed, prior to being made available for public review. The availability of on-street parking for Kakaako businesses is a valid concern.

5. We appreciate your comment regarding the legibility of figures and tables. We agree that the provision of this information on-line will aid in its readability.

6. As indicated in our response to your comment #11 of your September 2013 letter, a transit plaza is not mandatory but is consistent with HCDA's vision. Whether it would be constructed, and by whom, is not known at this point in time. It is, therefore, not a formal requirement.

7. The following definition has been added to the Glossary of Terms in the Final EIS:

   "Shared Industrial Street: A street in Central Kakaako whose usage includes frequent vehicular activity related to abutting light industrial uses along it."

8. The bullet you identify is located on page 15 of the EIS's Executive Summary. It is not intended as an exhaustive cross-referenced list of every detail in the document. As identified in the Table of Contents for Chapter Four, a discussion of the HCDA's revised Reserved Housing policy is presented in Section 4.10.5.2 of Chapter Four.

9. Table 4-3 in Chapter Four is intended to summarize the findings of the Supplemental Cultural Impact Statement regarding newly identified cultural resources. It is followed by an extensive discussion of each resource category beginning on page 59 of Chapter Four and ending on page 65. The methodology employed for identifying new cultural resources begins on page 58 in Chapter Four. Please understand that the new identifications do not indicate "groups" as stated in your letter. They indicate "cultural resources". This designation is not intended to impose any restrictions or limit any rights or use. Rather, it is intended to acknowledge that contemporary resources can have a cultural value. HCDA acknowledges that ultimately the market will decide over the long term whether identified cultural resources survive in place, relocate, or disappear. The EIS is intended to disclose information.

10. The implementation of noise mitigations on the elevated rail line is the responsibility of HART. Your question is best addressed to HART. The noise study HART conducted for its EIS evaluating the impacts of rail concluded that the 3-foot high parapets were adequate. The TOD Overlay Plan EIS is disclosing that information.

11. The Draft TOD Overlay Plan and the EIS that evaluates it present initial recommendations, not final unilateral decisions. The recommendation is based upon a detailed study conducted by the traffic consultant retained by HCDA. If this recommendation were to be implemented, it would likely require the acquisition of land from both adjoining parcels.

12. Your comments about floor area and takings raise a valid concern. The HCDA believes that it can be resolved in the manner you have proposed as an agreement between Servco and City/HART.

This letter responding to your comments will be mailed to you and will also be included in the Final EIS for the TOD Overlay Plan together with your comment letter, as will all other comment letters and HCDA's response letters thereto.

The HCDA anticipates submitting the Final EIS for acceptance to the Governor's Office through the Office of Environmental Quality Control by the end of June 2015. The Final EIS will be published in the Environmental Bulletin after acceptance by the Governor's office. The HCDA will initiate TOD Plan finalization and TOD Rule making process once the Final EIS is accepted by the Governor's office and published in the Environmental Bulletin.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

HART

HONOLULU AUTHORITY for RAPID TRANSPORTATION

IN REPLY REFER TO:
CMS-AP00ENV-00497

Daniel A. Grabauskas
EXECUTIVE DIRECTOR AND CEO

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February 20, 2015

Mr. Anthony J. H. Ching, Executive Director
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Attention: Ms. Amy Mutart

Dear Mr. Ching:

Subject: Transit Oriented Development (TOD) Overlay
Kakaako Community Development District (KCDD)

Thank you for providing the Honolulu Authority for Rapid Transportation (HART) with the opportunity to comment on the Hawaii Community Development Authority (HCDA) KCDD TOD Overlay Plan Draft Environmental Impact Statement (DEIS) dated January 8, 2015, with notice published in the *Environmental Notice* on January 8, 2015. The DEIS discusses two TOD alternatives: Alternative A, which examines TOD opportunities when the maximum building height is 700 feet; and Alternative B, which examines TOD opportunities when the maximum building height is 418 feet. Both TOD alternatives incorporate strategies identified in the Draft TOD Overlay Plan published May 20, 2013 (Appendix A to the DEIS). HART supports HCDA's overall effort to develop a TOD Overlay Plan in the KCDD. We would like to provide clarification with respect to the Honolulu Rail Transit Project (HRTP) and feedback on the following aspects of the DEIS:

- **Terminology:**
  - The HRTP employs a rail technology called "light metro." Please note that references to the rail technology should be termed light metro instead of light rail, rail rapid transit, HART rapid transit, or any other iteration thereof.
  - The rail project should be referred to as the "Honolulu Rail Transit Project" or "HRTP," not "HART." HART is the semi-autonomous agency of the City and County of Honolulu (City) that is responsible for the development and construction of the HRTP. See, e.g., page 9 of the Executive Summary of the DEIS ("The fixed guideway transit system – HART – is presently under construction.")
  - Page 7-24 of the Draft TOD Overlay Plan (Appendix A) regarding Alternative A employs the term "dual columns." This should be replaced with the term "straddle bent columns."

CITY AND COUNTY OF HONOLULU, Alii Place, Suite 1700, 1099 Alakea Street, Honolulu, Hawaii 96813
Phone: (808)768-6159 Fax: (808)768-5110 www.honolulutransit.org

- **Downtown Station:**
  - The DEIS states that HART will provide a pedestrian overpass over Nimitz Highway at the Downtown Station (Draft TOD Overlay Plan pages 5-8 and 7-18 of Appendix A to the DEIS). This concourse enables rail passengers to directly access the station from either side of the highway. HART encourages HCDA to coordinate with the City and the Hawaii Department of Transportation Highways Division, which has jurisdiction over Nimitz Highway, to enhance the pedestrian crosswalk at this location.
  - HART supports the concept of a pedestrian-scramble intersection, as mentioned in Station Access (SA) 9.2 of the Draft TOD Overlay Plan (page 7-18 of Appendix A to the DEIS), and suggests considering a signalized left turn from Bishop Street to Nimitz Highway in the diamond head-bound direction.
- **Parking:** The DEIS recognizes the need to provide for and manage limited vehicle access to transit stations (Draft TOD Overlay Plan, SA4, page 7-7 of Appendix A to the DEIS). HART would like to emphasize that it is coordinating with the City's Department of Transportation Services (DTS) to accommodate transit passenger drop-off by TheBus or TheHandi-Van close to the stations. HART includes at least one service vehicle access easement at each transit station. Due to site constraints, HART is not providing automobile parking at any of the stations in the KCDD. Any short- or long-term parking, as well as kiss-and-ride drop-offs, would have to be provided by the City, HCDA, or private land owners.
- **Bicycle Connectivity:** The DEIS encourages bicycle connectivity and storage at the HRTP stations and on the trains (Draft TOD Overlay Plan, SA3, page 7-5 of Appendix A to the DEIS). HART is designing the system to accommodate bicycles on assigned trains, as well as narrow ramps along stairs ("bike troughs") at stations to assist rail passengers in maneuvering their bicycles through station level changes. HART is also providing bicycle racks at each station for passengers who prefer to park their bikes while they ride the train. At certain stations where it can be accommodated, HART may support the installation of bicycle lockers. HART also notes that construction of a cycle track under the guideway, as identified in Figure 5-16 Potential Cycle Track on Halekauwila and described on page 5-56 of the Draft TOD Overlay Plan (Appendix A of the DEIS), will need to address relevant safety, security, and maintenance considerations.
- **Transit:** HART supports SA2 Maximize feeder transit connectivity of the Draft TOD Overlay Plan (page 7-5 of Appendix A to the DEIS), which encourages "a seamless connection between feeder bus routes and the rail line." Although most of Kakaako will be within convenient walking distance to a rail transit station, the development of intermodal transit facilities, such as a transit center, will help to enhance mauka-makai connections for workers, patrons, and other users in Kakaako. Such facilities could also enhance regional connectivity for areas not currently served by the rail system, such as East Honolulu or even Windward Oahu. Priority bus facilities along key arterials such as South Street or Ward Avenue will also help to facilitate mobility.

- **Pedestrian Access:** The DEIS suggests several pedestrian improvements along Halekauwila, Queen, and Pohukaina Streets (Draft TOD Overlay Plan, SA8.2, page 7-14 of Appendix A to the DEIS). HART supports the suggested improvements and encourages HCDA to coordinate with the City DTS and Department of Planning and Permitting to develop those pedestrian improvements around rail stations.
- **Signage and Wayfinding:** HART has developed a signage and wayfinding manual for areas within the limits of the stations. Although this manual precedes an external signage and wayfinding plan, the station specific manual aligns with the goals of SA5 Ensure Clear Wayfinding in the Station Area of the Draft TOD Overlay Plan (page 7-7 of Appendix A to the DEIS), regarding MA5 Implement a Coordinated Signage and Wayfinding Program of the Draft TOD Overlay Plan (page 5-20 of Appendix A to the DEIS). HART will work with HCDA, the City, and other private and public stakeholders to coordinate district-wide signage and wayfinding efforts outside of the station.
- **Rail Noise:** Section 4.8.3.1. (pages 131-133) is inconsistent with the Honolulu High-Capacity Transit Corridor Project (HHCTCP, now known as the HRTP) Final Environmental Impact Statement (FEIS)/Section 4(f) Evaluation (June 2010) related to noise and vibration impacts generated by the HRTP. Please refer to the HHCTCP FEIS Chapter 4.10.3 Environmental Consequences and Mitigation for additional information. HART would like to clarify that in accordance with Chapter 4.10.3 of the HHCTCP FEIS, noise mitigation for the HRTP includes 3-foot high parapet walls, which are also known as sound barriers, along the guideway, wheel skirts, and sound absorptive materials under the track along the following properties in the KCDD: 860 Halekauwila Street and 1133 Waimanu Street. HART encourages HCDA to ensure that developers consider HRTP in the design of new buildings.

If you have any questions, please feel free to contact Ms. Aki Marceau, Land Use and Sustainability Manager, at 768-6177 or amarceau@honolulu.gov.

Sincerely,

Daniel A. Grabauskas
Executive Director and CEO

cc: The Honorable David Y. Ige, Governor, State of Hawaii
State, DOH, Office of Environmental Quality Control
Lee Sichter, LLC

HAWAII COMMUNITY
DEVELOPMENT AUTHORITY

KAKAAKO
KALAELOA

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Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Daniel A. Grabauskas
Executive Director and Chief Executive Officer
Honolulu Authority for Rapid Transportation
City and County of Honolulu
1099 Alakea Street, Suite 1700
Honolulu, Hawaii 96813

Dear Mr. Grabauskas:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 20, 2015 commenting on the above document. Following are responses to your comments in the order they were presented in your letter.

1. We will endeavor to correct references to the HRTP system.

2. Acknowledged.

3. The term will be revised in the Final TOD Plan.

4. Acknowledged.

5. Your suggestion is acknowledged. However, HCDA has no jurisdiction over the intersection of Bishop Street and Nimitz Highway.

6. Acknowledged.

7. Acknowledged.

8. Acknowledged.

9. Your suggestion is noted.

10. Acknowledged.

11. A new paragraph has been added to Section 4.8.3.1 in Chapter Four of the FEIS to improve the document's consistency with the HRTP EIS:

    "As specified in the Honolulu High-Capacity Transit Corridor Project Final EIS, noise mitigation for the Honolulu Rapid Transit Project includes 3-foot high parapet walls, which are known as sound barriers, along the guideway, wheel skirts, and sound absorptive materials under the track along the following properties in the KCDD: 860 Halekauwila Street and 1133 Waimanu Street."

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

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COMMUNITY DEVELOPMENT AUTHORITY

Hawaii's Thousand Friends
25 Maluniu Ave., Suite 102., PMB 282 • Kailua, HI 96734 • Phone/Fax: (808) 262-0682 E-mail: hhf@lava.net

February 19, 2015

Hawai`i Community Development Authority
461 Cooke Street
Honolulu, Hawai`i 96813

Draft Environmental Impact Statement
for the Kaka`ako Community Development District Draft
Transit—Oriented Development Overlay Plan

Hawaii's Thousand Friends has the following general and specific comments on this DEIS.

The DEIS states that HCDA will determine what course of action to take regarding TOD after the EIS process is completed. The FEIS must provide information on the time-line and the process including.

The DEIS does not mention if HCDA has the ability to grant additional height and density variances and/or exemptions over and above the incentives granted for TOD projects. This information must be included in the FEIS.

The FEIS must explain what course of action HCDA will take if public infrastructure improvements do not keep up with the increased capacity of the selected Alternative.

Best Management Practices are mentioned in the DEIS several times but there is no definition of those practices. The FEIS must provide information on what methods; measures and practices will be used during construction to "mitigate the short-term impacts of construction activities, including impacts on traffic, noise quality, and air quality."

The FEIS must provide information on the short and long-term, direct, indirect or cumulative social and economic impacts from redevelopment and new TOD on existing residential neighborhoods, businesses, Thomas Square, McKinley High School, public spaces, possible evictions from homes and businesses for redevelopment and gentrification because this information is not in the DEIS.

The FEIS must provide information on the long-term, direct, indirect and cumulative economic and social impacts from TOD projects on areas adjacent to KCDD and within the ½ mile TOD radius.

0.6 Unresolved Issues

It is stunning to read the unresolved issues identified in the DEIS and it is not explained in this document how or when these issues will be resolved.

- Lack of the relief sewer line to "resolve capacity" issues
- Lack of up to date population data from the City and County of Honolulu
- Uncertainty of "community amenities" until a time when a property's redevelopment plan is approved by HCDA
- Lack of a Parks Master Plan
- Date when implementation of the incentive based program will be implemented

0.2 Summary of Proposed action and Alternatives

- Explain what "exemplary public benefits" are and identify the process to award these benefits.
- The FEIS should explain the process HCDA will use to create the specific parameters of the incentive zoning that will be addressed during TOD Overlay rule making by HCDA. Will HCDA hold public hearings on rule making? Will the public have an opportunity to present testimony?
- The FEIS should explain the process HCDA will use in the selection of the TOD Alternative. Will HCDA hold public hearings prior to their selection? Will the public have an opportunity to present testimony on the selected Alternative?

Potable Water

- The FEIS must identify the types of water saving measures that will be required of each development.
- Will a dual water system be required for each new TOD project and redevelopment?
- Section 2.3.7.2 seems contradictory. One sentence says that the water distribution system is adequate to meet peak hour domestic demand for either alternative but describes how approximately 37,600 linear feet of existing 6 and 8-inch water mains will need to be replaced with new 12-inch diameter mains to meet both peak hour domestic demands and fire flow requirements. Which statement is correct?
- The FEIS must provide information on whether the current water distribution system is adequate to accommodate both Alternatives or whether the above improvements need to be place before approvals will be granted and construction begins.

Wastewater

- Has the site for the new pump station been selected? Will the new pump station be publically or privately funded? Has funding for the station been appropriated?
- The DEIS says that "the City is presently studying preliminary alignments for new Relief Sewer Corridors to address sewage flow outside of KCDD to help reduce demand on existing flow outside of the KCDD."
  - When will the City study be completed?
  - Explain in the FEIS if HCDA will approve projects before the City completes the study and needed infrastructure is in place.
- The FEIS must provide information on whether there is adequate capacity at the Sand Island Wastewater Treatment Plant to handle the additional wastewater generated by KCDD TOD.
- Within the 20-year horizon what has HCDA determined to be the exit point when TOD projects will no longer be socially or economically viable?

- The DEIS acknowledges that wastewater surcharge will continue to be a problem but because of the sewer line depths, spills will not occur. While wastewater may not rise to street level any wastewater outside of a pipe goes somewhere.
- The FEIS must explain where wastewater outside of a pipe goes and identify short-term, long-term, direct and cumulative impacts on public health, the environment, underground water (karsts), marine life and the ocean ecosystem from these spills.

Solid waste

- The DEIS states that "private contractor provided collection services might be required to meet future increased demands" but does not provide any information beyond that statement.
- The FEIS must provide data on the additional number of collection trucks needed to accommodate the anticipated residential and commercial growth and identify the direct, indirect and cumulative social impacts from increased noise and traffic.
- Will affordable/workforce housing projects be serviced by the city or will individual owners and renters have to pay for private solid waste collection? If it is the later explain in the FEIS the impacts of the additional costs.

Drainage

- The DEIS states that "The existing drainage system is *inadequate* to accommodate and dispose of design storm rainfall quantities in both the *existing* and *future* conditions" and that "HCDA presently has no current schedule for design or construction of improvements that have been identified to address existing deficiencies, including pavement resurfacing and new drain inlets and/or catch basins." (Emphasis added)
- The FEIS must identify the direct, indirect and cumulative impacts on public health, the environment and coastal ecosystems from the current inadequate drainage system.
- The FEIS must identify in what phase of the TOD approval process will a developer have to show that drainage is adequate for their project.
- The MAIP describes the criteria to calculate rainfall runoff and states that the existing major trunk drain lines would discharge an estimated 2,500 cubic feet per second of rainfall runoff to the ocean.
- The MAIP concludes that the existing drainage system is inadequate to accommodate and dispose of design storm runoff quantities in both the existing and future conditions.
- Since the DEIS did not identify any short or long-term, direct, indirect and cumulative impacts on human health, marine life, and coastal ecosystem from discharging 2,500 cubic feet per second of rainfall into the ocean that information must be provided in the FEIS.
- The FEIS must also identify the types of pollutants in the runoff and their impacts on marine life, coastal ecosystems, underground water and human health.
- The DEIS states "Since most of the future improvements were anticipated to be vertical development, additional rainfall runoff, due to development was anticipated to be negligible; and as such, surface water pending concerns and existing drainage system inadequacies would not be exacerbated" and while the "existing drainage system has deficiencies, the Proposed Action will not exacerbate them." This is an unsatisfactory answer.
- The FEIS must explain how the above conclusion was reached and provide a time line showing when improvements will be made to correct this intolerable situation and identify the short and long-term, direct, indirect and cumulative social, economical and environmental impacts caused by the existing inadequate drainage system.

- The FEIS must address whether the Mauka Area Infrastructure Plan recommendations on how to reduce future runoff quantities are requirements that each developer must follow or just suggestions.
- Will a National Pollutant Discharge Elimination System general permit be required for each TOD project or can/will HCDA obtain a general permit for all TOD projects?

Electricity

- The FEIS must address whether renewable energy sources will be required for each private development.
  The FEIS must identify the direct, indirect and cumulative effects on the environment and energy consumption if renewable energy are implemented for each project.
- Has the location for the proposed Cooke Street Substation been identified? Will the new substation be adequate to serve the additional loads required for all TOD Alternatives?
- The FEIS must identify the short and long-term and cumulative social and economic impacts on energy consumption and TOD projects if HECO does not build a new substation "within" and "beyond" 9 years.

Traffic/Transportation

- The DEIS states that "The increase of residents, visitors and workers in the Mauka Area will exacerbate traffic conditions" with "Slower travel times anticipated" but does not define "slower" and does not provide any information on impacts on residents and businesses within KCDD and traffic along main corridors i.e. Kapiolani, Ala Moana Blvd.
- The FEIS must provide information on the short and long-term, direct, indirect and cumulative social economics impacts of "slower" traffic on residents, businesses and traffic within and outside of KCDD.
- The DEIS states "...there are no intersections within KCDD that deteriorate from LOS E or better under the Future Baseline Condition to LOS F under the proposed action" but does not provide any information on the LOS of those intersections under either Alternative A or B.
- The FEIS must provide the same information on intersections within KCDD for Alternatives A and B and then evaluate the short and long term, direct, indirect and cumulative social, economical and environmental impacts from all three Alternatives.
- The DEIS states that "...three intersections along Ala Moana Boulevard (at South Street, Cooke St and Ward Avenue) and two on Ward Ave (at Queen Street and Kapiolani Blvd.), are forecast to operate at LOS F under Future Baseline Condition and would operate at LOS F under Proposed Action."
- The FEIS must provide information on the short and long-term, direct, indirect and cumulative social and economic impacts of the LOS F at these intersections on traffic and the quality of life of residents and businesses within KCDD and commuters outside KCDD.
- The DEIS lists mitigation measures to facilitate improved bicycle, pedestrian, and transit access within the KCDD but does not discuss how these measures will ease and improve conditions outside of KCDD. This information must be in the FEIS.
- The FEIS must explain what is meant by "Traffic delay under proposed action is not anticipated to result in a level of delay to busses requiring additional buses or operating costs compared to the Future Baseline condition. Therefore, no significant transit operations impact resulting from proposed action."
- The FEIS must explain how buses would not be delayed under the same LOS F conditions that will impact car traffic at these intersections.

- The FEIS must explain how "Rail will strengthen the connection between Kapolei, downtown Honolulu and Kaka`ako, UH Manoa and Waikiki" when the rail line is not slated to go to UH Manoa or Waikiki.
- The FEIS must identify the streets that will be "reconstructed" as "shared industrial streets,' define the purpose, and provide information on the short and long-term, direct, indirect and cumulative social and economic impacts on residents, businesses, and traffic within KCDD and outside of KCDD from implementing this change.
- The DEIS mentions inter-agency coordination and partnerships is needed to provide adequate mobility and access but does not provide information on what measures and processes have been or will be implemented to accomplish this goal. Identify the agencies involved and provide information in the FEIS.
- What type of "streetcar" identified in Figure 2-8 will be used to connect destinations within and outside of Kaka`ako? Will the "streetcar" be on a fixed rail? Explain why a streetcar is needed and how the will be different from busses.
- The DEIS states that depending on which scenario is selected TOD within Kaka`ako is anticipated to create 13,382 to 76,196 construction jobs over the next 20 years. Yet, no information on impacts is provided.
- The FEIS must provide information on short and long–term, direct, indirect and cumulative economic and social impacts from increased traffic created by construction jobs on air quality, noise, and traffic congestion within KCDD, adjacent neighborhoods and transportation corridors in and around Kaka`ako..
- To get an accurate picture of travel patterns the FEIS must provide information on how many people will travel by rail, bus, walk or bicycle to their jobs within Kaka`ako.
- Are the estimated 11,887 residential units and estimated 36,219 jobs used to develop TAZs current numbers or future numbers?

Social Impacts

- The DEIS states that an important unanswered and currently unanswerable, question is the actual timing of this build out. Yet, residents are asked to comment on developments that are anticipated to occur over 20 years.
- The FEIS must explain how the comments, predictions and mitigation measures made in this in 2015 will be still relevant in 2035.
- The FEIS needs to explain how the determination was made that "increased residential population growth within Kaka`ako due to higher densities under the Proposed Action generally means people already on Oahu would live in Kaka`ako rather than somewhere else..." and that "...that...additional full-time residential population in Kaka`ako does not mean growth in the island wide population"
- Was immigration of people moving to Oahu from other countries, other islands or other states to retire, work, or move back home or to purchase a condo as a second homes and or vacation rentals considered in making these statements?
- The DEIS states that "Market forces will in reality determine the actual development, nature, location, and characteristics of any Kaka`ako hotel." That may be true but the fact that hotels are being considered in residential and commercial areas as a part of the TOD Overlay Plan means that eventually hotels will be incorporated into KCDD and unless the social and economical impacts of introducing transient uses into areas outside of resort zoning the true impacts will never be known.
- The FEIS must provide information on the short and long-term, direct, indirect and cumulative social, economical and environmental impacts on existing neighborhoods, traffic, businesses and quality of life from introducing hotels and tourism into the residential and commercial KCDD.
- Explain in the FEIS how approval of the FEIS does not create an entitlement to develop three hotels somewhere within an identified TOD half-a-mile zone.
- Explain in the FEIS how a "part-time resident" will help generate new jobs and what types of jobs.
- Explain in the FEIS how the conclusion was reached that "...part-time residents will conservatively not be counted among the island wide impacts" when part-time residents will use our islands resources and infrastructure..
- The FEIS must evaluate the direct and indirect social impacts on full time residents living in a condominium complex where a substantial number of condos are either lived in part-time or used as transient vacation rentals.
- The DEIS states that "...it also builds upon the current Ward Centers and Kamehameha Schools Master plans, which will have more street level activity" but does not explain in what way TOD builds on these two plans.
- The FEIS must explain how the Proposed Action builds on these plans and if the already accepted Kamehameha Schools and Ward Centers Plans can be modified or granted variances and/or exemptions to allow TOD.

Noise

- Since many travel corridors within and outside of KCDD exceed 65 DBL noise level and are considered unacceptable the FEIS must identify the short-term, long-term, direct and cumulative impacts on public health from these unacceptable noise levels.
- The FEIS must provide information on the noise level objectives for interior and exterior noise.
- Are double pane windows a requirement in TOD projects? If not, explain why.
- The FEIS must define what noise impacts are anticipated from TOD projects on current KCDD residents and identify what mitigation measures are being proposed.
- The FEIS must address the short and long-term, direct and indirect social and economic impacts to residents, businesses who will be forced to either close all windows and/or use air conditioning because of the combined outside noise of rail, construction and increased population.
- The FEIS must identify the impacts from the use of air conditioning on electrical resources.
- The FEIS must identify specific measures to address increased impacts from noise levels on parks, open spaces and recreational areas.
- The FEIS must identify what interior and exterior noise levels are acceptable in the KCDD and how those levels will be reached.

Schools

- HCDA promotes the benefits of TOD having good access to schools. Unfortunately area elementary schools Royal and Ka`ahumanu are operating at near capacity and may not be able to accommodate large surges in enrollment in the future. So walking to school is out.
- The only school option mentioned in the DEIS is the possible use of state property at 690 Pohukaina, which has been selected for reserved housing. There is no other statement about providing schools in KCDD.
- The FEIS must explain why HCDA is not requiring landowners to provide land and/or funds toward the development of schools for children that their developments will attract

- Working with the DOE projections below the FEIS must provide information on the short and long-term, direct, indirect and cumulative social and economic impacts of not planning or building new schools to accommodate the projected population.
    - TOD Alternative A at build out would generate enough students from Kaka`ako alone to fill more than three elementary schools, almost enough to fill one middle school and one high school.
    - Future Baseline Condition is almost the equivalent of one additional elementary school and about one-quarter each of additional middle and high schools
    - TOD Alternative B, the impact numbers are equivalent to 60% of one elementary school and nearly one-fifth of additional middle and high schools.
- Since schools seem to be a very low priority in this DEIS there is a concern that Kaka`ako is not being developed for families but for part-time owners and transient vacation rentals. And as shown in other sections of this DEIS the number of part-time residents out numbers permanent residents.
- What provisions has HCDA put into place to prevent KCDD from becoming dominated by part-time residents and resort type uses?
- Since it is unlikely that land within Kaka`ako will be donated for schools the FEIS must identify long-term, direct and cumulative impacts facing students living in Kaka`ako but forced to go outside their community to attend school such as the lack of community cohesiveness since schools are community gathering places, safety crossing busy streets, transportation etc.

Housing

- The DEIS states that redevelopment in the Mauka Area may result in the displacement of some tenants and/or apartment or condominium unit owners if the owner of an under-utilize property decides to redevelop to achieve the maximum allowable density. But does not provide any information on the impacts of people being moved out of there homes and businesses
- The FEIS must provide short and long-term, direct, indirect and cumulative social and economic impacts on residents and business owners displaced by redevelopment.
- The FEIS must provide information on the long-term, direct, indirect and cumulative social and economical impacts from the loss of community, loss of businesses that service those communities, residential and business relocation, whether relocation assistance will be provided by the landowner and the ability and willingness of HCDA and other state and county agencies to help with relocation.
- The FEIS must provide information as to whether eminent domain can be used in the redevelopment of property.
- The DEIS states that "Under HCDA reserved Housing Policy 20% of all new units will be build as workforce housing" and for "landowners and/or developers to achieve density incentives, workforce housing may even take on greater percentages in some areas."
- The FEIS must define the "areas" where additional incentives can be given, what the incentives will be, and how those incentives will benefit the general public.
- The FEIS must provide information on the long-term, direct, indirect and cumulative social and economical impacts on residents and businesses living and working near one of the areas receiving density incentives.
- The primary areas susceptible to loosing homes and businesses are Sheridan Track, which is half in the TOD area and Central Kaka`ako, which is primarily small businesses because

the pressure from being surrounded by high rises buildings whose high cost will eventually drive the owners to sell their properties
- The FEIS must provide information on the short and long-term, direct, indirect and cumulative social and economical impacts on these communities surrounded by high-rise developments.

Parks and Open Space

- The DEIS states that "Neither HCDA, the primary provider of parks and recreational facilities in Kaka`ako, nor the city Dept of parks and Recreation plan to construct additional parks in or near Kaka`ako, suggesting that impacts will continue to existing parks in the region."
- The FEIS must identify the long-term, direct, indirect and cumulative health and social impacts of the lack of parks on children living in high-rises and not having opportunities within their neighborhood for active and passive recreation and on parents seeking opportunities to play sports with their children.
- What does "already negotiated open spaces" mean? At what stage of the process do these negotiations take place?
- In the FEIS identify the term and uses of "negotiated open spaces."
- In the FEIS define and state the purpose of "activated spaces."
- If the Proposed Action directs HCDA to tie a minimum of fee ($ per SF) or per FAR to public active space explain in the FEIS why a tiered program is being proposed instead of a direct minimum fee?
- What criteria will be used to determine if a public space is "usable" or "neighborly?" What types of "multiple functions" would be considered in evaluating whether a public space is "usable" and "neighborly"?
- The DEIS states that "..it is HCDA's position that the nearby Ala Moana Regional park is sufficient to meet the future needs of Kaka`ako's growing population."
- The FEIS must explain how this conclusion was reached.
- HCDA believes that population growth in Kaka`ako would result in the need for additional parks personnel but HCDA's budget for park facilities is $0.
- Unless more parks are built in Kaka`ako pressure on nearby Ala Moana Regional Park will be increased and that impact will be felt around the island.
- The FEIS must identify the long-term, direct, indirect and cumulative social, economic and environmental impacts of overcrowding at Ala Moana Regional Park on Kaka`ako residents and the island population that uses Ala Moana Park.
- The DEIS states that current HCDA rules require that 55 sq feet of recreational space be allocated per dwelling unit development in Kaka`ako. The City and County standards calls for 110 SF of green space per dwelling unit for any high-rise multi-family or town house development anywhere on the island.
- KCDD doesn't even meet Oahu standards and HCDA still cannot or will not provide public parks.
- The FEIS must identify the direct, indirect and cumulative social impacts on KCDD residents from inadequate green open space and parks in their community.
- The DEIS states that a Parks Master Plan would thoroughly study park needs and the best way to meet those needs but that such a study has not been conducted.
- HCDA has known for years that rail transit would go through KCDD and that with or without TOD KCDD would grow and need more parks but obviously parks are not a priority because this study has not even begun.

- The FEIS must explain why a Parks Master Plan was not done *before* or in conjunction with this DEIS and explain the implications of not having a study that shows park needs and provides direction for the development of parks within KCDD

Cultural Resources

- The DEIS states that "Implementation of the Proposed Action could potentially impact several contemporary cultural resources identified in the District including facilities, public parks and grounds, memorials and commemorations, religious and spiritual gathering places and public art installation and entertainment centers" but does not provide any information on how or which contemporary cultural resources will be impacted.
- The FEIS must identify the public parks and grounds, memorials and commemorations, religious and spiritual gathering paces and other public installations and centers, identify their uses and value then evaluate the potential short and long-term, direct and indirect and cumulative social and economic impacts on each of the cultural resources.
- Nowhere in this DEIS are the long-term impacts of higher density and close proximity to historic parks and building discussed.
- The FEIS must provide information on how historic parks and buildings will be impacted by the close proximity of higher, denser and closer development.

Visual

- The DEIS provides many examples of how mauka-makai and view planes will be impaired.
  - "It is anticipated that the build-out of the Mauka Area under Future baseline Condition or either TOD alternative will impair the existing mauka-makai views"
  - "The greatest impacts will be seen with the higher intensity growth in number and frequency of high-rise buildings under TOD Alternative A" with "TOD Alternative B resulting in impacts greater than the Future Baseline Condition, but less than the TOD Alternative A."
  - "Under either Alternative, panoramic views from identified viewpoints, and existing high-rise or low-rise buildings will be curtailed, but existing view corridors along major mauka-makai streets will be preserved."
  - This statement isn't true as seen in Photo Plates 4-36,4-37 and 38 Coral Street at Ilalo Street showing makai-mauka views lost to high rises.
  - "Buildings fronting Ala Moana Blvd and situated in the Makai Area *will have reduced views* of the Ko`olau Range..." (Emphasis added)
    - What buildings are referred to in the Makai Area that *will have reduced views* of the Ko`olau Range?
  - "...buildings along Kapiolani and in the Thomas Square Neighborhood will have reduced views of the ocean" but "This is typical of an urban environment where external views of landscapes are slowly exchanged for framed views and new architectural features."
- The FEIS must identify and explain the long-term, direct, indirect, cumulative social and economic impacts from the loss of ocean and mauka-makai views on an island culture, tourism and existing and future residents within and outside of KCDD.
- The DEIS states that one of the methods to preserve "visual resources" is to "Encourage staggered building heights (tower configurations should provide skyline diversity)"

- Since "encourage" is not a requirement but just a suggestion the FEIS must explain how "suggesting" instead of requiring staggering building heights will help preserve "visual resources" especially since TOD projects are incentive driven.
- One of the methods suggested to help "maintain the KCDD's long-term residential desirability" is to provide guidelines ensuring that building placement is "neighborly."
- The FEIS must provide a definition of "neighborly" and identify how implementing this type of placement will ensure that a development will retain its residential desirability.

Shade and Shadows

- This section is a series of illustrations Figures 4-40 to 4-53 showing shade and shadows from the different scenarios but there is no information on short and long-term and cumulative impacts of shadows and shade on existing neighborhoods, daytime solar glare, reflective surfaces on buildings and cars, visual impacts on adjacent neighborhoods such as Punchbowl or the increased need for more electricity because of the lack of sunlight. The FEIS must address these issues.
- The DEIS mentions that due to development pressure Mother Waldron Park, surrounded by potential sties eligible for participation in the TOD Overlay Plan, may need "public improvements that animate and improve the existing park."
- The FEIS must define "animate," identify the types of improvements envisioned for the park and explain the short and long-term, direct, indirect and cumulative impacts caused by being surrounded by TOD projects.
- The FEIS must address how any proposed changes will impact the historical features of Mother Waldron Park, which is listed on the State Register of Historic Places.

Secondary and Cumulative Impacts

- The DEIS states that "... implementation of TOD, when added to other adopted and proposed projects of a similar nature (such as other TOD projects envisioned by the City along the transit line corridor) may have a significant affect on a regional scale, and at an island wide scale."
- While this statement acknowledges there could be a "significant affect" on a regional and island wide from other TOD projects HCDA seems to think that Kaka`ako is like Las Vegas, what happens in Kaka`ako stays in Kaka`ako and does not have a impact outside its 602-acre borders.
- Development within the KCDD 602-acres carved out of the center of urban Honolulu has a ripple effect that cannot be ignored.
- The FEIS must evaluate and define the long-term, direct, indirect and cumulative social, economical and environmental impacts of transient oriented development in KCDD on the islands natural resources and regional infrastructure.
- The DEIS states that "Kaka`ako situated in the Primary Urban Center is intended to accommodate a substantial portion of O`ahu's population growth over the next 25 to 30 years." While that may be a true statement if TOD in KCDD takes up all the infrastructure capacity and public funds what are the long-term, direct, indirect and cumulative impacts on others wishing to develop in the PUC? What are the impacts on the development of the Second City?
- The FEIS must provide information on the cumulative direct and indirect social, economic and environmental impacts of TOD on the surrounding areas, travel corridors through KCDD, island wide water, sewer, electricity demands, impact on the Second City and percentage of funds for infrastructure.

- The FEIS must provide information on long-term, direct, indirect and cumulative social and economic impacts on others wishing to develop properties in the PUC but can not due to lack of infrastructure funds and capacity.
- The DEIS states that "The Proposed Action will have long-term effects on the decisions by Oahu residents about where to live, work, and play, which will, in turn lead to a redistribution of population." This statement seems to imply that more Oahu residents will move to KCDD rather than the Second City or other areas of the island.
- The FEIS must explain how that conclusion was reached.

0.5 Summary of recommended mitigation measures

- The seven Objectives in this section only deal with mitigation measures to "improve quality of life" within the 602-acres of the Kaka`ako Community Development District.
- These measures do not consider nor evaluate the multitude of short and long-term, direct, indirect and cumulative social and economical impacts on adjacent communities ranging from increased pressure on schools and parks, loss of views, loss of wind and sunlight, increased shadows, increased noise, reduced air quality, increased traffic and major transportation corridors going through KCDD.
- The FEIS must address the impact of the above issues on areas adjacent to KCDD.

1.2.3 Non-Governmental Master Plans

- The FEIS must explain why the Kamehameha Master Plan and the Ward Neighborhood Master Plan are mentioned in this DEIS TOD Overlay Plan.
- Does mentioning these two approve plans in this DEIS mean that the Plans can be revised and modified to add TOD?
- The FEIS must state whether the Kamehameha Master Plan and Ward Neighborhood Plan, which have been approved by HCDA, are eligible for TOD because of inclusion in this DEIS.
- Since Kamehameha's Master Plan and Ward Neighborhood Plans are mentioned in this DEIS the FEIS must provide information on the short and long-term, direct, indirect and cumulative social and economic impacts on the existing businesses, residents, traffic, infrastructure, view plains, air quality, and noise on surrounding areas. This information is especially critical if HCDA allows changes to the approved plans and grants variances or exemptions that could include increased height and density.

Alternative A

Land Use/Urban Design/ Mobility and Access

- What factors were considered when the decision was made to add hotels in the KCDD?
- The FEIS must address the direct, indirect and cumulative social and economic impacts on affordable housing, traffic, qualify of life, safety and security of adding transient uses in residential neighborhoods
- The FEIS must identify the "specific properties within the Mauka Area for consolidation to promote redevelopment. "
- The FEIS must clarify if the "incentive program to correlate allocation of active (open) spaces for additional height and capacity" is part of the "incentive program" which grants greater height and density bonuses or a separate program.
- If this is a separate program then the EIS must identify how many "incentive" programs there are within the TOD Overlay Plan and identify the purpose of each program.

- Since the two "iconic towers (heights between 500 and 700 feet with have greater impacts the location of those buildings and their direct, indirect, secondary and cumulative social, economic and environmental impacts on surrounding areas, traffic, air quality, increased shadows etc. must be included in the FEIS.
- Since one of the features of TOD is to "promote" "round the clock" activity in and near transit stations the FEIS must provide information on the direct, indirect and cumulative social and economical impacts on surrounding areas from the twenty-four hour activity
- and identify the amount and types of security that will be offered at each station.
- The DEIS states that for a "limited number of properties" an increased maximum allowable building heights" will be offered to encourage "exemplary" buildings. Other than this statement there is no information on what is the "maximum" height allowable or an "exemplary building."
- The FEIS must identify the location of the "limited number of properties," give the maximum height limit and provide a definition of an "exemplary" building.
- The DEIS states that one of the urban designs is to "preserve mauka-makai view corridors." Other than the identifying existing streets as view corridors what are the mauka-makai view corridors that will be preserved?
- The DEIS states that one of the reasons for the "iconic" towers is to provide "exceptional public benefits."
- The FEIS must explain what the "exceptional public benefits" are and how they are different from the benefits sought in the incentive program(s).
- The FEIS must identify the neighborhoods where "iconic" towers will be permitted and provide information on the direct, indirect, secondary and cumulative social and economic impacts from these extremely tall buildings on the surrounding neighborhood quality of life including air quality, noise and traffic.
- In the FEIS explain what measurement is being used to create a "significant separation" between iconic towers and identify how that measurement was reached.
- Provide information on the types of "flexibility" being offered in considering urban design.
- The DEIS promotes the establishment of a "design review process to ensure quality of building design." When will the "design review process" be established? How will participants be selected?
- The DEIS says that a district-wide traffic calming plan will be developed. What is a "district wide" traffic calming plan, what is the purpose, will the plan cover the entire 602-acres KCDD, how will traffic calming measures impact or improve major corridors within and outside of KCDD?
- What does a Downtown/Kakaako/Ala Moana "circulator system" that "enhances access to HART stations and key KCDD destinations and those in adjacent districts" consist of? If the system consists of busses or streetcars explain why there is a need for this system and explain how providing shuttle service does not defeat the purpose of TOD and Smart Growth, which is to live a healthy lifestyle by being able walking to destinations.
- What does "unbundle parking stalls from residential units to allow consumers to consider the optional purchase or rental of a stall" mean and what is the purpose? If the purpose is to provide a "buy in" program what are the impact on low-income homeowners, renters and businesses that need parking spaces?
- What does unbundle parking costs from commercial leases mean and how will it impact small businesses and their customers?

1.4 Guiding Principles of TOD

- One of the guiding principles of TOD is "to coordinate land use and transportation by concentrating development along reasonable direct corridors, so that most destinations are on the way to other destinations." In the FEIS provide a description of a "reasonable direct corridor" and provide information on how this corridor will directly and indirectly impact traffic on major transportation corridors within KCDD and outside of KCDD.
- One of the guiding principles is to provide tools needed "to ensure that the public realm is safe, comfortable and inviting for people of all ages and abilities."
- Describe the "tools" being considered and identify who these "tools" are designed for.
- One of the guiding principles is to direct "concentration and intensified activities near frequent transit."
- The FEIS must explain if "transit" includes bus stops. If bus stops are available for TOD then the FEIS must provide information on the direct, indirect and cumulative social, environmental and economic impacts of TOD at area bus stops on surrounding neighborhoods, residents and businesses, traffic, quality of life, increased noise.
- One of the guiding principles is to focus "improvements on those areas that have a higher potential for redevelopment... and buildings that have exceeded their useful life."
- How is the "useful life" of a building determined and who makes that determination?
- Explain what a "legible" public space is and provide an example.

2.2 Objectives of TOD

- Objective D1:
  - What are "reasonably direct corridors?"
  - What are the traffic, environmental and social impacts from spreading "demand throughout the day"?
- Objective D2:
  - What is the purpose of "minimizing the distances between intersections...?"
  - What are the direct, indirect and cumulative impacts on traffic and pedestrians when distances between intersections are minimized?
- Objective D3:
  - Design the spaces adjacent to HART stations...in ways that maximize access and benefit to the community.
    - Define what "spaces" are referred too.
    - What types of "spaces" will be considered a benefit to the community and how will that determination be made?
    - Define a "resilient neighborhood" and explain how it is different from a regular neighborhood.
- Objective D6:
  - Define "manage parking supply and demand" and explain how it will work for people who want a car, want more than one car and people driving to visit residents and businesses.
- Objective 2.3
  - In the FEIS list the "regulatory policies" that will ensure long-term tenure of affordable units.

2.3.1 Neighborhood Character

- Does the statement "The Proposed action explores the possibility of residential and mixed uses on these two potential development sites to support civic improvements" refer to developing property that is currently part of McKinley High School?

TOD Alternative A

- In the FEIS provide information on the short and long-term effects, direct, indirect and cumulative effects on the coastal environment, mauka-makai views, loss trade wind, loss of sunlight, noise, and coastal public access from developing higher densities including a hotel at the HECO property?
- The FEIS must provide information on the cumulative, short and long term, direct and indirect social, economic and environmental effects on Irwin Park, which is listed on the State Register of Historic Places, from the envisioned high intensity development and hotel at the HECO property
- The DEIS fails to identify the short and long-term environmental and social effects on McKinley High School and the students from the development of an iconic 700 - foot tower at Blaisdell Center. This information must be provided in the FEIS.

TOD Alternative A

- The FEIS must identify the short and long-term, direct, indirect and cumulative social and economic effects on decreased trade wind and sunlight, traffic, on existing buildings, residents and businesses from building more and taller towers above 400 feet to create a "dramatic skyline."

TOD Alternative B

- Pauahi Neighborhood
  - The FEIS must explain the long-term and cumulative effects of the loss of mauka-makai vistas from Ala Moana beach and Ala Moana Park, diminished sunlight and trade winds and eviction on existing residences and businesses from redeveloping the area between Auahi St and Ala Moana Blvd. "...to a high-rise residential neighborhood."

TOD Alternative B

- The FEIS must provide information on the short and long-term, direct and indirect and cumulative social, economic and environmental impacts from increased traffic, air quality, noise, eviction of residents and businesses, and water and sewer availability associated with the consolidation and development of privately owned and "selected" parcels near the Civic Center HART and in Central Kaka`ako.
- What are the cumulative, short and long term and cumulative impacts to small businesses located in the Central Kaka`ako Neighborhood from increased redevelopment pressure and the likely decrease of low-cost rental space?

2.3.2 Land Uses

- Explain in the FEIS how high intensity development with increased capacity in Kaka`ako will "Minimize island-wide development pressure on rural areas..." when property owners in rural areas can and will continue to seek approvals to develop their property?
- The DEIS says that up to three hotels are envisioned for Kaka`ako yet Table 2-1: Development Capacity in TOD Alternatives A Hotel Units lists four sites – Central Area Mauka, Aloha Tower, Auahi Neighborhood and Thomas Square.
- Which is the correct number of hotels planned for KCDD?

- The FEIS must provide information on the cumulative, short and long term impacts, direct and indirect social and environmental affects from increased noise, traffic, loss of quality of life and changing character of a neighborhood when adding tourist destinations where such uses don't presently exist.

2.3.2.1 Hotels and Tourism

- Describe how the "opinion" was reached that there is a demand for hotels within the Kaka`ako area?
- Explain how developing hotels in KCFF furthers HCDA's mandate to *meet the vast unmet community needs of lack of affordable housing and insufficient commercial and industrial facilities for rent, and necessary infrastructure for basic livability, such as parks and open space.*
- The DEIS touts one of the advantages of instituting TOD in KCDD is that development will be incentive driven thus increasing the ability to create more affordable housing yet the statement on this page says "As much as feasible, the HCDA will couple the reserved housing requirement with incentive-base zoning."
- Explain in the FEIS what is meant by "as much as feasible."

2.3.3 Mauka Development Parameters

- In the FEIS define the statement "The TOD Alternatives test the results of new FAR and height limitations, and the application of very general design standards..."
- Provide a definition of "as of right."
- In the FEIS identify the location and purpose of "tested sites" and explain the process used in selecting those sites?

Figure 2-2 Distribution of Building Heights – TOD Alternative A

- Describe in the FEIS what is the fall back position if Alternative A is selected as the preferred Alternative but the height limits imposed in Act 61 are not repealed.
- In the FEIS describe the types of "measures" and processes in place to ensure that incentive zoning programs are carefully managed to ensure that the community amenity is proportional and out weights any adverse effects caused by additional building bulk.

2.3.4 Urban Design

- Provide information on the following in the FEIS
  - What measures and processes are in place to "ensure" that a building is appropriately cited?
  - Define "typed streets" and describe their purpose?
  - Define and describe the purpose of "flexible" in this context.
  - Define "form-based framework" and describe the purpose.

2.3.6.5 parking

- Since many existing small businesses rely on customers coming from outside Kaka`ako describe in the FEIS how "park once," complete streets and parking calculations will impact their businesses?

2.3.7.8 Traffic Signal System

- The DEIS states that a regional study of existing and projected traffic flows is needed to determine signal timing.

- The FEIS must provide information on when such a study will be done and what agencies will be involved in this study. It is critical to have this information before TOD projects are approved and "entitled" because traffic is not only a problem for KCDD residents and businesses but for people traveling through, around and beyond KCDD.

3.3.2 Summary Description of Baseline Condition

- The Mauka Rules allow properties, currently with inadequate infrastructure, to retain the current FAR but once the infrastructure is upgraded the FAR will increase.
- Explain in the FEIS if a supplemental EA will be required when the FAR is increased and whether an EA will be for each project or cover the entire KCDD. This information is necessary because this DEIS is based on current data.

3.3 Comparing the Future Baseline Condition and the TOD Alternatives

- It is unclear why the text differs from the tables showing hotel units. The text states that three hotels will be allowed but both Table 3-2 and Table 3-3 list five hotel units – General Area Mauka, Aloha Tower Special District (twice), Auahi, and Thomas Square.
- The FEIS must provide the correct number of hotels and information on the direct, indirect and cumulative affects of adding transient accommodations and tourism into residential and commercial neighborhoods.
- The FEIS must explain why hotels are being considered in Kaka`ako and why tourism and transient accommodations are appropriate in residential and commercial neighborhoods.

Table 3-5:Population Comparison in 2035 – Proposed action vs. Future Baseline Condition

- How was the *Average De Facto Population* determined?
- Under both Alternatives the *de facto population* exceeds the *full time residential population*. Since the *de facto* i.e. not permanent residents population exceeds permanent residents the FEIS must identify what population – transient or permanent TOD projects will be built for?
- The FEIS must provide information on how a *de facto population* that surpasses the *resident population* meets the objectives of HRS 206E.
- The FEIS must identify what, if any, controls or requirements are in place to prevent the current trend of temporary residents as opposed to permanent residents.

4.2 Topography, Geology, and Soils

- This section states "Additional fill material may be imported from elsewhere on Oahu as needed in the redevelopment of individual properties" and that "...the Proposed action provides an additional opportunity to mitigate sea level rise issues to some extent; as individual properties are redeveloped, their at-grade elevation can be raised by the use fill material to create a higher base elevation."
- The DEIS does not provide any information on the type(s) or amount of soil to be imported nor are receiving locations identified.
- The FEIS must provide this critical information because unless EAs are required for each TOD project this DEIS is the only opportunity to evaluate the short and long-term, direct, indirect and cumulative impacts of imported soil on the environment, air quality, runoff and coastal areas.
- If is impossible to provide site-specific information, regarding these critical concerns, in the FEIS then supplemental EAs must be required for each TOD project that will import soil.

4.7.5 Comparing 2035 Future Traffic Conditions With The Proposed Action To Baseline Conditions Without The Proposed Action And To existing Conditions

- The DEIS states that the Makai area was not included in the TOD Overlay but this section includes Makai.
- The FEIS must state whether Kaka`ako Makai is being considered in this DEIS TOD Overlay Plan and available for TOD projects.

Table 4-15 Travel Demand Comparison

- The FEIS must state whether the term "household" refers to the number of units or the number of people.

Table 4-18: 2035 Peak Hour Intersection Level of Service – Proposed Action (TOD Alternative A)

- Several intersections in this table and identified on page 110 were found to be at D, E and F FOS levels and potentially significant at 2035 TOD build-out.
- Table 4-22 states that with mitigation levels at Ala Moana/South Street and Ala Moana and Cooke Street and Ala Moana and Ward will remain at LOS F due to side street traffic. While HCDA is improving traffic conditions within the 602-acre Community Development District traffic flowing from KCDD adds to the congestion of main travel corridors.
- It is unacceptable to quote the 2009 EIS and say that there is no feasible mitigation. If that is the conclusion without TOD then what is the conclusion with TOD?
- Ala Moana and Kapiolani are major corridors connecting people traveling east and west. From these findings the impact on traffic in these corridors from TOD within KCDD will be impossible.
- The FEIS must identify mitigation measures that will relieve traffic congestion at these critical intersections or not approve TOD projects in KCDD until mitigation measures are in place that truly relieve congestion at these bottleneck intersections.
- The FEIS must provide information on the short and long term, direct, indirect and cumulative impacts on traffic, air quality, and quality of life from these unimproved intersections.
- Since HCDA does not have jurisdiction over the streets in Kaka`ako what agencies are responsible for implementing mitigation measures at these low functioning intersections?

4.10.6 Health Care

- According to the DEIS EMS considers metropolitan Honolulu to be on the cusp of needing a new EMS unit and is in discussions with HCEA for another 24-hour/day site in Kaka`ako at the old Fisherman's Wharf site. What is the status of these talks?
- The DEIS states that long-term care hospitals, health care clinics, specialty care facilities, acute care hospitals are all located outside Kaka`ako.
- The FEIS must provide information on whether a new EMS will be built in KCDD and whether health care clinics and acute care hospitals are proposed as part of TOD projects, whether those facilities will be privately or publically funded and must include the short-term, long-term, direct and cumulative social and economical impacts of not providing these types of facilities as part of TOD projects.

4.10.8 Public Emergencies and First Responders

- The DEIS states Future Baseline Scenario would at full build-out require an increase of ten on duty fire fighters, two support staff, and two fire trucks. Twice those numbers would need to be added for TOD Alternatives A and B.
- In the DEIS HFD states that HFD's "ability to provide services in Kaka`ako will also be impacted by TOD including rail infrastructure, traffic calming and pedestrian friendly street features, and the potential increase in vertical height of the area's buildings."
- The DEIS does not provide any information on the long-term, direct and cumulative impacts on public safety if the required fire fighters, staff and fire trucks are not a requirement in the selected Alternative. That information must be provided in the FEIS.
- The DEIS states that under the Future Baseline Scenario at full build out would require an increase of about 31 police officers, based on December 2012 ratio of 8.9 police officers per 10,000 people in District 1 with TOD Alternative B requiring 8.9 police officers when including the de facto population at full build-out would generate a total demand for nearly 40 police officers. Alternative A will demand 43 police officers at build-out plus rental of a small field and report writing office.
- These are all critical public health and safety services and the DEIS only states the deficiencies but doesn't provide any guidance or recommendations on how, when or where these services should be included in TOD projects.
- The FEIS must provide information on the short-term, long-term, direct, indirect and cumulative social, economic and safety impacts on people living and working within KCDD if these vital services are not provided at the quantity and quality identified by each of Oahu's first responders.

4.9 Air Quality

- Identify what types of "agricultural operations" in the project area cause air pollutants?

4.12.5.1 Urban Design

- The DEIS states that some neighborhoods could have a discontinuous visual appearance where redevelopment occurs on lot-by-lot basis. Visual contrasts between older and newer buildings could increase and there is a potential for incompatibility, and/or abrupt transition between older and new buildings.
- While the DEIS acknowledges that there will be "incompatibility" and "abrupt transitions between old and new buildings" it does not identify potential short and long-term and cumulative social, environmental and economic impacts on existing residences and businesses from a new tower on residents and businesses from cutting off sunlight, wind, loss of community, loss of sense of place, increased traffic and noise. This information must be presented in the FEIS.
- In the FEIS explain how a site becomes "entitled"?
- The DEIS acknowledges that TOD Alternative A would change the character of the overall Mauka area but does not provide information on the impacts from those changes.
- The FEIS must provide information on the short and long term, cumulative social, economical and environmental impacts on residents and businesses from increased traffic, air quality, noise, loss of sense of place, potential eviction for redevelopment, and loss of community.
- The FEIS must discuss the short and long term, direct, indirect and cumulative social and economic impacts on individuals displaced by redevelopment, the loss of a home to luxury condos and loss of small local businesses to larger homogenized businesses.

4.12.6.8 Light and Glare

- In the FEIS explain what types of street level landscaping will absorb light.
- In the FEIS explain how HCDA would enforce "limiting the hours of illumination" when one of the features of Kaka`ako is that it will be a active 24-hour area and one of the stated needs for lighting is safety.
- In the FEIS providing information on whether "limiting the hours of illumination" applies to high-rise residents and businesses and if so how this strategy will be enforced and impacts on residents and businesses.

5.0 Relationship to Land Use Plans, Policies and Controls

5.2.2 Hawaii State Plan (Chapter 226)

- In the FEIS explain how the TOD Overlay alternatives comply with §226-3 Overall because the DEIS does not show how community and social well-being, caring for others and the well-being of community will be sustained, enhanced or achieved.
  - (3) Community or social well being is a value that encompasses many things. In essence, it refers to healthy social, economic, and physical environments that benefit the community as a whole. A sense of social responsibility, of caring for others and for the well-being of our community and of participating in social and political life, are important aspects of this concept.
- The TOD Overlay Alternatives do not comply with §226-4 State goals to "enhance[s] the mental and physical well-being of the people" and "nourishes[s] a sense of community responsibility, of caring, and of participation in community life." This is statement especially true since the number of part time residents including tourists is greater than the number of full time residents.
- The TOD Overlay Alternatives do not comply with §226-12 Objectives and policies for the physical environment—scenic, natural beauty, and historic resources because the alternatives do not "Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features." Instead each alternative blocks or decreases views and vistas.
- The TOD Overlay Alternatives do not comply with §226-16 Objective and policies for facility systems—water because none of the alternatives promote the reclamation and "productive use of runoff water..." or promotes "water conservation programs and practices..."

5.2.4 State Ocean Resources Management Plan

- The TOD Overlay Alternatives do not comply with the State Ocean Resources Management Plan which seeks to "improve coastal water quality by reducing land-based sources of pollution" because the "existing major trunk drain lines would discharge an estimated 2,500 cubic feet per second of rainfall runoff to the ocean." None of the Alternatives offer solutions to prevent this discharge and improve water quality.
- The TOD Overlay Alternatives do not meet the Management Goal to "enhance and restore existing public shoreline areas and scenic vistas" instead the massive development of high rises including TOD projects will obliterate almost all public shoreline scenic vistas.

5.2.6 State of Hawaii Environmental Protection Act (Chapter 343 & 344, HRS)

- Chapter 343 requires disclosure of the "environmental effects of a proposed action, effects of a proposed action on the economic welfare, social welfare, and cultural practices of the

community..." and "measures proposed to minimize adverse effects and alternatives to the action and their environmental effects." Very few environmental and social welfare effects have been presented in this DEIS.
- The FEIS must provide information on environmental, social. economical and cultural impacts.
- The DEIS TOD Overlay Alternatives do not meet HRS 344 State Environmental Policy to:
  - Establish "communities which provide a sense of identity...and aesthetic and social satisfaction with the natural environment which is uniquely Hawaiian"
  - Promote recycling of waste water
  - Promote open space in view of its natural beauty...
  - Foster lifestyles compatible with the environment...
  - Develop communities, which provide a sense of identity and social satisfaction in harmony with the environment...

5.3 County Plans, Policies, and Controls

- The DEIS TOD Overlay Alternatives do not meet the following General Plan policies
  - III Natural Environment
    - Objective A Policy 7 *Protect the natural environment from damaging levels of air,...and noise pollution.* Object B Policy 2 *Protect Oahu's scenic views, especially those seen from highly developed and heavily traveled areas*
  - IV Housing Objective A Policy 10
    - *Promote the construction of affordable dwellings, which take advantage of Oahu's year-round moderate climate.*
  - X Culture and Recreation Objective D
    - *Require all new developments to provide their residents with adequate recreation space*

HAWAII COMMUNITY
DEVELOPMENT AUTHORITY

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KALAEOA

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Ref. No.: PL TOD 18.3

June 10, 2015

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25 Maluniu Avenue, Suite 102
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Kailua, Hawaii 96734

Ladies and Gentlemen:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 19, 2015 commenting on the above document. We note that your letter consisted of 20 pages and was unsigned.

Following are responses to your comments in the order they were presented in your letter.

Timeline:

1. HCDA's authority is limited by the legislation that enabled it and the rules that guide development within the District. HCDA is permitted to grant variances from its administrative rules pursuant to Hawaii Administrative Rules §15-217-82.

2. Development proposals submitted by landowners must be reviewed and approved by City agencies with responsibilities pertaining to infrastructure (sewers, water, streets, etc.). If a project is approved by HCDA but is denied a sewer connection permit, for example, the project cannot proceed until such time that the City determines there is adequate sewer capacity for the project or the applicant makes the necessary improvements to accommodate the project. Implementation of the selected Alternative ultimately depends upon the initiative of individual landowners regarding the development/redevelopment of their respective properties.

3. Best Management Practices is a standardized term that is codified in federal law and refers to practices to mitigate environmental impacts in a manner that is commonly recognized as being desirable and effective. They vary depending upon the nature of the activity. For example, HAR, §11-55-01 mirrors 40 CFR §122.2 and defines the term "Best management practices" or "BMPs" as "…schedules of activities, prohibitions or designations of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of State waters. Best management practices also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. Hawaii Administrative Rules Chapter 11- 55, titled "Water Pollution Control," implements the National Pollution Discharge Elimination System (NPDES) permitting program for point source water pollution control in the State of Hawaii, under authority delegated to Hawaii by the federal Environmental Protection Agency (EPA) pursuant to the Clean Water Act (CWA), 33 U.S.C. §1342(b). As the proposed TOD Overlay Plan represents an overarching plan to guide future development in the KCDD in response to the presence of rail, it is premature to commit to specific project-related BMPs, that are shaped in large part by the actions associated with a specific development. Specific BMPs must be articulated by developers at the time they submit development applications to HCDA and its sister agencies for review and approval.

4. The specific information you request cannot be known until such time that an individual property owner submits a development proposal. The EIS is essentially a programmatic document that provides a high level overview of the issues. To that end, the general socio-economic impacts have been evaluated to the best of our ability at this point in time.

5. Section 6.5 of Chapter Six presents a discussion of secondary and cumulative effects. The following paragraph has been added to address your concerns:

   "Long-term direct effects will likely include increases in population-related activities including the increased presence of people, both residents and visitors and improved economic conditions resulting of their demand for goods and services. Long-term indirect effects can extend to the redistribution of goods and services to accommodate the redistribution of population anticipated by TOD."

   The socio-economic impact analysis presented as Appendix G in Volume Two of the EIS presents an exhaustive discussion of direct, indirect, and cumulative economic and social effects of the Draft TOD Overlay Plan.

Unresolved Issues:

1. In each instance, the discussion under Section 6.6 of Chapter Six identifies why an issue is unresolved and what must be done to resolve it. Some of the action needed is the responsibility of other agencies over which HCDA has no control or influence. However, in the course of deliberations with other agencies, HCDA has been reassured that actions are being taken to address the identified issues.

Summary of Proposed Action and Alternatives:

1. Exemplary public benefits are those benefits that will contribute to achieving the Objectives identified in the Draft TOD Plan (beginning at page 2-3). They are not awarded, but rather are considered to be points of negotiation between a prospective developer and HCDA.

2. HCDA will work with its consultant team to develop a detailed program for the incentive-zoning concept. Public hearings will be held to receive public and agency input on the program.

3. At this point in time, HCDA can only implement Alternative B because it is proscribed by Act 61 (2014) of the State Legislature. Before adopting the TOD Overlay Plan and Rules, the HCDA is required to conduct two separate public hearings as required by Hawaii Revised Statutes 206E.

Potable Water:

1. The EIS discloses the intent of HCDA to require developers to comply with LEED certification. It is premature to identify specific water saving measures because they are project-specific, depending upon the nature of the project.

2. No, HCDA has no provisions for a dual water system. The existing water supply infrastructure in Honolulu does not support a dual water system and therefore it would not be practicable to require a dual water system on individual projects.

3. The statements are not contradictory. The reference to new mains pertains to fire-flow. The phrase "both peak hour domestic consumption demand requirements and" has been deleted from the end of Section 2.3.7.2 of Chapter Two to clarify the intent of the statement.

4. The TOD Overlay Plan will be implemented on a project-by-project basis, depending upon the timing of development proposed by individual landowners. Upgrades to the existing system to will be determined on an as-needed basis. The entire system does not need to be upgraded before any new development occurs.

Wastewater:

1. The site for the new pump station has not been selected by the City. It will be up to the City to determine the source of funding.

2. The City has provided no information to HCDA as to the anticipated date of the study's completion. While HCDA may approve projects before the completion of the study, they may not be granted a sewer connect permit if the City determines there is not adequate capacity to accommodate them. Thus, the City will ultimately determine which projects can move forward and which might be delayed by needed sewer improvements.

3. Once the second digester is competed, HCDA has been advised by the City that the Sand Island WWTP will have the necessary capacity.

4. We are unable to answer your question. The social or economic viability of a specific project 20 years hence will be based on a variety of factors that are unknowable at this point in time.

5. Sewer mains and sewer manholes are typically designed to flow partially full, meaning that the depth of wastewater flowing in the pipes is typically less than the diameter of the pipe. A surcharged sewer system means that the sewer mains are flowing full and the fluid level is above the top of the pipe within the sewer manholes. Sewer mains and sewer manholes are built water-tight. In a surcharged condition, barring any defects in the pipes or manholes, the wastewater remains within the sewer mains and manholes and does NOT leave, go outside of, the sewer system.

   There are several measures in place that minimize the possibility of wastewater leakage:

   a. Since 2000, the City's Department of Environmental Services (ENV) has instituted a program to repair or replace sewer mains that, by measurement, have a potential to leak.

   b. The City's design standards require that newly installed sewer pipes be tested during construction. If the pipe leaks during the test, it will not pass; and only pipes passing the leak test are accepted by the City.

   c. The City's Standard Specifications require precast concrete manhole installation where the pipe invert is below the ground water table, which would apply for a majority of the Kaka'ako Mauka Area.

   d. By the City's sewer design standards, sewer lines are required to have minimum 4' cover beneath pavements; therefore at the sewer manholes, there is at least 4' of height that the fluid level could rise to before overflowing at the sewer manholes.

   Although the sewer system may be surcharged, the wastewater will stay within the systems pipes and manholes.

6. Please see response #5 above. In the event of a leak or spill (release), the Department of Health (DOH) mandated emergency response procedures would be followed to contain/minimize the release amount and to protect the public's health. In the event of a nearshore wastewater release, deterioration of the nearshore water quality could result, but would depend on the size of the release and its location with respect to the shoreline. The ocean is typically a self-cleaning entity; and over time, the DOH tested parameters will normalize to the point where the public can be advised that the water is safe for recreational use. Unless a large volume is released or the releases are frequent, cumulative impacts to the public health or to the ocean ecosystems are not anticipated.

Solid Waste:

1. It is the responsibility of individual landowners to contract for solid waste pick up.

2. The TOD Overlay Plan is a conceptual plan. It is not possible to calculate the number of collection trucks that will service the KCDD. Whether an individual building is serviced once or twice a week will depend upon the size of the building and the number of occupants – numbers which are unknown at this point in time. In addition, collection routes may be combined such that a new building may not even require additional collection vehicles.

3. Solid waste collection services are provided by both private companies as well as the City's Refuse Division. It is up to each individual project to determine which service it prefers and to request them.

Drainage:

1. The EIS is a disclosure document.

2. The discussion in Section 4.11.4.2 goes on to state that because most of the future improvements were anticipated, the impact will be negligible.

3. At the time an application for a development permit is submitted to HCDA.

4. Correct.

5. The EIS is a disclosure document.

6. The impacts of the existing system have been addressed in the previous EIS for the Mauka Area.

7. Runoff from an urban area typically includes petrochemicals from roadways. These pollutants have existed for nearly 100 years and are not known to have a significant effect on receiving waters.

8. The statement provided in the EIS is a valid conclusion.

9. The determination was made by consulting civil engineers. All new projects must comply with City, State and Federal standards as discussed on page 250 and 251 of Chapter Four.

10. Project requirements are presented at the top of page 250 in Chapter Four.

11. Each new project must determine whether it triggers the NPDES Permit requirement.

Electricity:

1. It is HCDA's intent that new projects be designed for LEED certification. HCDA will not require projects to develop renewable sources of electricity. Each project will be expected to engage in energy conservation. The result will be a reduction in demand.

2. Please refer to the discussion in paragraph two at the top of page 253. A preliminary location has been identified but that may change given that the final decision is more than a decade away. If a new substation is constructed, it will be sized to address demands at the time of its construction.

3. This is beyond the scope of the TOD Overlay Plan EIS.

Traffic/Transportation:

1. Slower means that traffic speeds may decline. Please see discussion of Traffic Impact Criteria on page 69 of Chapter Four.

2. Tables 4-13 and 4-18 in Chapter Four provide a detailed and specific account of the anticipated impacts.

3. Please see Table 4-18.

4. Please see Table 4-18 and the discussion under Section 4.7.5.

5. The EIS is a disclosure document.

6. Table 4-8 presents the specific impacts of changes in Level of Service. The following statement has been added to Section 6.3 in Chapter Six:

   Increases in vehicular traffic will result in slower vehicular travel times, especially during peak hour travel periods. Intersections operating at Level of Service F will impede the movement of vehicles, including the transport of goods and the provision of some vehicular-oriented services.

7. The implementation of mitigation measures within the KCDD is not anticipated to create significant effects outside of the District.

8. The statement means that delays are not anticipated that would require the addition of new buses to the fleet.

9. For intersections operating at Level of Service F, all vehicles utilizing those intersection during peak travel hours will experience the same general effects.

10. Reference to UH and Waikiki has been deleted from the statement under Section 4.7.7.

11. Section 4.7.9.2 identifies the specific industrial streets in Central Kakaako. The impacts of street reconstruction are beyond the scope of this EIS. The reconstruction of City streets will likely trigger a separate environmental assessment.

12. The agencies involved would include the State Department of Transportation and the City Department of Transportation Services.

13. The streetcar service presented in Figure 2-8 is meant to provide an example for illustrative purposes. No specific decisions about types of streetcar service have been made.

14. The Socio-Economic analysis presented in Appendix G includes an exhaustive discussion of impacts resulting from new job creation.

15. As discussed in several separate sections of the EIS (e.g., traffic, noise, and air quality) construction impacts are generally short-term in nature.

16. Please refer to Section 4.7.3.2 of Chapter Four regarding Trip Generation and Travel Mode. The traffic models utilize trip generation data assumptions provided by OMPO.

17. Future numbers.

Social Impacts:

1. As explained in the EIS, a horizon year must be provided for purposes of comparison. The reader is advised that the EIS is programmatic in nature.

2. For the purposes of the EIS, they are assumed to be relevant in the future. However, conditions may change.

3. Please refer to Section 1.6 of Appendix G for a discussion of increased residential growth as it relates to Kakaako-specific impacts versus island wide impacts.

4. Yes. Please refer to the discussion under Section 2.2 of Appendix G pertaining to part-time residents.

5. Eventuality is not a foregone conclusion. The EIS fully addresses the impacts of new development in KCDD associated with TOD, including the possibility of hotels. Please note that hotel uses are allowed in other portions of Honolulu outside of Waikiki as discussed in Section 3.4.1.2 of the City's Primary Urban Center Development Plan.

6. We believe the analysis presented as Appendix G accomplishes that.

7. As discussed in the EIS, every new development requires a Development Permit approval by HCDA. The EIS is a disclosure document, not an entitlement.

8. A part-time resident requires goods and services but during a shorter time period than a full-time resident. The cumulative impact of part-time residents will generate demand for additional goods and services, but not likely at the same rate as full-time residents.

9. The discussion under paragraph (1), Section 2.7.4 of Appendix G states that part-time residents are counted. Without a specific citation, we cannot find the statement you allege to be made in the document.

10. We believe the information you request is beyond the scope of a programmatic EIS.

11. As the Ward and Kamehameha Master Plans were approved prior to the preparation of the Draft EIS, they are considered to be part of the baseline condition.

12. Modifications and/or variances tend to be relatively minor in character, when compared to the overall scope of a master plan.

Noise:

1. Noise levels are regulated by the State Department of Health. Exposure to excessive levels of noise can result in hearing impairment, based upon the extent of exposure, and in less severe circumstances, the loss of sleep if the excessive noise occurs overnight. Loss of sleep, in turn, can lead to a reduced ability to concentrate during daytime activities.

2. Chapters III and IV of Appendix E address noise level objectives, which are stated in terms of compatibility.

3. The level of detail you request is beyond the scope of this programmatic EIS.

4. As discussed in Section 4.8 of Chapter Four, the EIS uses a methodology of using noise receptors as a means of identifying potential impacts. This is an acceptable practice utilized by the State Department of Health to evaluate noise impacts.

5. In Hawaii, the construction of new apartment buildings, office buildings, and commercial buildings usually include the provision of air conditioning, which often results in windows being closed, regardless of ambient noise conditions outside. A discussion of the specific impacts experienced by individuals who may choose to close windows on a case-by-case basis is beyond the scope of the EIS.

6. The EIS takes the use of air conditioning into account as part of its analysis of electrical impacts.

7. Tables 2 and 3 of Appendix E present results of the noise analysis along identified roadways, which is a methodology acceptable to the State Department of Health.

8. We believe the overall analysis presented in Appendix E accomplishes this.

Schools:

1. HCDA is actively working with the State Department of Education to address concerns about schools.

2. Correct.

3. School-related impact fees fall under the jurisdiction of the State Department of Education.

4. Please see #1 above.

5. Section 7.2.5 of Appendix G addresses the Proposed Action's impacts on education.

6. We respectfully disagree with your conclusion.

7. As discussed in the EIS, the number of potential hotels is limited to three. HCDA has no control over the character of use of new residential units by their owners.

8. We do not agree with your conclusion. Please see #1 above.

Housing:

1. It is believed that the net gain in new residential units in the District will present new opportunities for tenants who might be displaced, thus allowing them to remain in the District.

2. The following discussion has been added to Section 4.10.13.3 in Chapter Four:

   While the potential redevelopment of some existing residential and commercial properties is possible, resulting in the displacement of some occupants and/or businesses, the addition of new housing opportunities and new commercial activities in the KCDD, both under the Proposed Action and the Future Baseline Condition, will provide new housing and commercial opportunities which could enable displaced residents and/or businesses to relocate elsewhere in the District, thereby mitigating to some degree the impact of displacement.

3. Please see response #2 above concerning impacts. Matters concerning relocation assistance by other agencies are beyond the scope of this EIS. The HCDA presently has no policy concerning relocation assistance.

4. Eminent domain can be theoretically used for any property, but there is no current intention by HCDA to do so.

5. The EIS is a disclosure document.

6. The term "areas" means specific projects. The elements of the incentive-based program will be fleshed out during rule making for the TOD Overlay Plan.

7. The EIS addresses the breadth of impacts associated with new population growth in the District. The provision of density incentives is generally included in this analysis.

8. Your conclusion reflects one possible outcome.

9. A new discussion has been added to Chapter Four:

   4.10.13.6 Displacement of Existing Residents/Tenants/ Businesses

The potential transformation of the Mauka Area under either the Future Baseline Condition or the Proposed Action could result in the displacement of some existing residents and/or businesses, as the result of property redevelopment or because increasing property values may result in higher real property taxes which certain businesses may not be able to afford. This is a natural consequence of a community based redevelopment initiative. However, as discussed briefly above, the provision of new residential and commercial opportunities within the very same community will help, to some degree, to offset the negative impacts of displacement. Properties within the Sheridan Neighborhood portion of the KCDD and the Central Kakaako Neighborhood are particularly susceptible to this potential outcome. It may become necessary for HCDA to consider adopting measures that could aid property owners and/or tenants affected by displacement.

Parks and Open Space:

1. The EIS is a disclosure document.

2. As discussed in the EIS, the HCDA has implemented a separate initiative concerning park planning for the District, which is identified as an Unresolved Issue in the EIS.

3. It means open space resources that have been negotiated during the HCDA's review of an application for a Development Permit.

4. The following definition for Negotiated Open Spaces has been added to the Glossary of Terms:

   Areas of open space that have been identified and required during the HCDA's review of a Development Permit application.

5. The term is defined in the fifth bullet on DEIS page 265.

6. Mauka Area Rules (HAR, Chapter 217) require public facilities dedication in the form of land or a cash-in-lieu, if approved by the HCDA board, for all development projects in the Kakaako Community Development District. Any development under the TOD plan will still require the base public facilities dedication as provided in the Mauka Area Rules. So, there is already a provision for a direct land dedication as a condition for development. In addition, the TOD Plan provides for a tiered public facilities dedication fee requirement for any additional incentive provided to development project under the TOD Plan.

7. The term "neighborly" pertains to a qualitative judgment concerning the proximity of a feature to a neighboring property. Criteria include proximity, access, visual impact etc.

8. The EIS is a disclosure document.

9. This conclusion is based on the fact that Ala Moana Regional Park is defined by the City as a regional park providing recreational opportunities for a vast area of Honolulu that includes Kakaako.

10. The EIS is a disclosure document.

11. As discussed above, HCDA has undertaken a separate planning initiative pertaining to the provision of parks and open space.

12. These considerations are being addressed as part of the above-mentioned parks planning initiative by HCDA.

13. That is correct.

14. HCDA is not required to comply with the City's standards. Please see discussion under #2 above.

15. Information provided on the City & County of Honolulu, Department of Park and Recreation indicates that there is over 800 acres of parks and open space in urban Honolulu between Chinatown and Waikiki. Therefore, we believe that there is adequate park and open space in urban Honolulu.

16. The study has, in fact commenced.

17. The parks study could not begin until the socio-economic impacts of the Draft TOD Overlay Plan were identified, as disclosed in Appendix G of the EIS.

Cultural Resources:

1. Please refer to Figure 4-7 and Table 4-3 in Chapter Four.

2. We believe that Section 4.6 of the EIS accomplishes this.

3. This is discussed in Section 4.6.3 of Chapter Four. Please refer in particular to the first paragraph on DEIS page 60 in Chapter Four.

4. Please see response #3.

Visual:

1. The EIS is a disclosure document.

2. Section 4.12.2 of Chapter Four discusses the City's Primary Urban Center Development Plan, which is the over-arching planning document that provides the baseline discussion for why views are protected. The protection of views is important for many reasons including, but not limited to the cultural values associated with named and storied places and the scenic attributes of mountains and ocean, which are valued by residents and visitors alike.

3. The EIS is a disclosure document.

4. In some instances, the specific placement of a building to achieve a staggering effect may not be possible due to site limitations or constraints such as cultural resources, existing or proposed utilities, or requisite setback requirements, to name a few.

5. Correct.

6. Neighborly is a qualitative term intended to introduce civility and maturity to the conversation. A "neighborly" building placement takes into account considerations expressed by adjacent tenants or building occupants.

Shade and Shadows:

1. A discussion of shade impacts is specifically addressed at the top of DEIS page 297 in Chapter Four. The discussion of glare and reflective surfaces is not relevant to this particular section. The presence of shade does not result in a lack of sunlight, rather, a reduction in the amount of sunlight that might be otherwise visible. The projection of shade over a building does not necessarily mean that lighting demand within a particular building may increase. Even in shaded areas, ambient light is typically available in abundance. Building glare is a consideration that is addressed during HCDA's review of Development Permit applications.

2. The EIS is a disclosure document.

3. The term "animate" when used in the context of urban design means to increase activity, access and/or usage. The EIS, in its totality, addresses these impacts.

4. Specific potential impacts upon Mother Waldron Neighborhood Park from immediately adjacent development

projects can only be assessed when a specific project is known and an application for a Development Permit is submitted to HCDA. General impacts on the Park have been addressed throughout the EIS, and particularly in sections pertaining to traffic impacts, noise impacts, cultural impacts, and visual impacts.

Secondary and Cumulative Impacts:

1. The EIS is a disclosure document.

2. We do not agree with your assessment of HCDA's views.

3. The development impacts of Kakaako have not been ignored, as is evidence throughout the current EIS, as well as previous EISs conducted for the Mauka Area and the Makai Area.

4. We believe that the EIS accomplishes this task.

5. The Proposed Action will not "take up all the infrastructure capacity and public funds" as you assert. In fact, it will provide new infrastructure and generate additional government revenues as discussed in Appendix G. In general, development opportunities in the PUC are generally limited to the rehabilitation of existing properties. TOD in Kakaako will not necessarily undermine or restrict the rehabilitation of other properties in the PUC. We suspect that development decisions in the Second City are guided largely by geographic considerations, and thus, are also not affected by TOD in Kakaako.

6. We believe the EIS in its totality addresses these concerns to the extent they are relevant.

7. This is beyond the scope of the EIS. Infrastructure capacity varies from area to area and the hypothetical lack of capacity

for, say sewers, in one area does not preclude over-capacity in another.

8. The statement was not intended to suggest a preference of one over the other. People will move to areas that provide them with the attributes that best serve their individual and familial needs. The statement you quote is intended as a general observation and a practical disclosure.

Summary of Mitigation Measures:

1. The EIS is a disclosure document.

2. The section on Mitigations is not intended to address impacts. Impacts are discussed throughout Chapter Four. Where specific mitigation measures are warranted, they are presented.

3. While the primary intent of the EIS is to address the impacts of the Proposed Action within the area under the authority of the HCDA, regional impacts are addressed throughout the document where applicable.

Non-Governmental Master Plans:

1. The EIS discusses the fact that these master plans were approved prior to the preparation of the Draft TOD Overlay Plan and are, therefore, considered to be part of the Future Baseline Condition.

2. Modifications to the master plans can be made to accommodate TOD, but they must be submitted to the HCDA as amendments to the existing plans, and approved by the HCDA pursuant to established procedures.

3. The following discussion has been added to the end of Section 1.2.3 in Chapter One:

Implementation of the TOD Overlay Plan will present Kamehameha Schools and Howard Hughes Corporation with an opportunity to embrace new opportunities related to transit-oriented development. However, in order to do so, the existing master plan must be formally amended and that amendment must be approved by HCDA.

4. Your request is beyond the scope of the EIS. The EIS is focused on the impacts of the Draft TOD Overlay Plan rather than the impacts of the already approved Kamehameha and Ward Neighborhood master plans.

Alternative A:

1. The decision was primarily based on City policy as expressed in Section 3.4.1.2 of the Primary Urban Center Development Plan that notes that PUC sites outside of Waikiki will be needed for hotels. The decision also takes into account the experience of the urban design consultant in TOD planning for other cities in the United States and Canada.

2. We believe that the totality of the EIS accomplishes this as a programmatic level document.

3. Please see Figure 3-5 in Appendix A.

4. It is intended to be.

5. Only one overall incentive program is contemplated.

6. Figure 4-1 in Appendix A identifies the Neighborhoods where an *iconic tower* could conceivably be located. The specific siting of such a tower must be initiated by the landowner. The EIS in its totality addresses the impacts of siting such a tower together with other elements of the Draft TOD Overlay Plan.

7. Detailed information concerning security and the nature of twenty-four activity is beyond the scope of the EIS.

8. See #7.

9. Please refer to Chapter 4 of Appendix A.

10. Please refer to Figure 3-7 in Appendix A.

11. Please see Figure 4-5 in Appendix A.

12. Correct.

13. They are the same.

14. See response #6 above.

15. See Figure 4-2 in Appendix A.

16. Flexibility in urban design is discussed throughout Chapter Four of Appendix A.

17. Specifics about Design Review have not yet been decided. This will occur after HCDA revises the Draft TOD Overlay Plan to a Final document.

18. Traffic calming is generally addressed in Chapter 6 of Appendix A. Specific elements of the plan have not yet been formulated. The Plan will focus on the Mauka Area. The Plan will coordinate with planning efforts by the State DOT and the City's DTS to support traffic calming initiatives in areas adjacent to the District.

19. Access to transit stations is addressed in Chapter 7 of Appendix A. Shuttle service and other means of access including bicycling are considered to be supportive of and consistent with pedestrian initiatives.

20. Unbundling refers to the current requirement that a certain amount of off-street parking stalls be provided for every new residential unit or square footage of commercial area. Separating the parking stall requirement from the unit or floor area creates new opportunities for improving the efficient use of existing and new parking stalls. Please refer to Chapter 8 of Appendix A.

21. Please see response #20.

Guiding Principals of TOD:

1. A reasonable direct corridor is street or roadway that is typically used as the most direct route for traffic to major destinations (such as Downtown or Ala Moana Center). The traffic study presented in the EIS as Appendix D addresses impacts on all roadways in the District including direct corridors such as Ala Moana Boulevard, Queen Street, and Kapiolani Boulevard, among others.

2. The EIS is a disclosure document.

3. Please see discussion on page 6-27 of Appendix A.

4. The EIS is a disclosure document.

5. The discussion in Appendix A, beginning on page 5-35 addresses transit, including buses. The EIS includes an impact analysis of buses as well as light rail transit.

6. The EIS is a disclosure document.

7. Useful life is determined by the landowner/building owner.

8. A legible public space is a public area that is designated for public use, such as a sidewalk.

Objectives of TOD:

1. See Response #1 in Guiding Principals above.

2. It helps to reduce demand during peak travel times in the morning and afternoon.

3. It creates more flexibility for pedestrians in choosing their route.

4. See analysis throughout Appendix D.

5. Spaces are areas between buildings and structures.

6. The space under the elevated rail, for example.

7. A resilient neighborhood responds in a positive way to change.

8. See Chapter 8 of Appendix A.

9. See discussion of the HCDA's Reserved Housing Policy in the EIS.

Neighborhood Character:

1. No.

TOD Alternative A:

1. The information you request is disbursed throughout the EIS in the various sections pertaining to the topics you identify. For example, the analysis of shadows on the HECO site is addressed in the Shadow discussion in Chapter Four.

2. The information you request is disbursed throughout the EIS in the various sections pertaining to the topics you identify.

3. The information you request is disbursed throughout the EIS in the various sections pertaining to the topics you identify.

TOD Alternative A:

1. The information you request is disbursed throughout the EIS in the various sections pertaining to the topics you identify.

TOD Alternative B, Pauahi:

1. The information you request is disbursed throughout the EIS in the various sections pertaining to the topics you identify.

TOD Alternative B:

1. The information you request is disbursed throughout the EIS in the various sections pertaining to the topics you identify.

2. The value of the subject properties will likely increase, resulting in higher property taxes for the property owner. To the extent that the property owner passes these on to the tenants, costs to tenants may increase. This could result in some tenants being forced to relocate their business elsewhere.

Land Uses:

1. Rural landowners may seek development approvals, but the City and State will be less inclined to grant approvals when new density opportunities are available in existing urban areas.

2. Table 2-1 does not say that. You have misread it.

3. 3.

4. See discussion throughout Chapter Four in relevant sections such as traffic and noise.

Hotels and Tourism:

1. It was based upon a consultant's review of market conditions.

2. We don't know what the KCFF is. The development of hotels will make better use of the particular property where they are being considered. Under an incentive based program, the provision of more affordable housing units might be negotiated as part of the review of a hotel development permit.

3. The TOD Overlay is an incentive-based program. HCDA's Reserved Housing policy affects all new development.

4. See previous response.

Mauka Development Parameters:

1. It means that they evaluate the impacts of FAR, height, and general urban design standards.

2. Already permitted or approved.

3. All TOD eligible sites, as identified in Figure 2-1 were evaluated by the urban design consultant based on property size and proximity to the light rail line, among others.

Distribution of Building Heights:

1. Alternative could not be implemented.

2. That responsibility rests with HCDA staff.

Urban Design:

1. The appropriate siting of new buildings will be addressed under the adoption of proposed rules to implement TOD.

2. Please refer to Figure 4-10 in Chapter Four.

3. Certain streets may be modified from their original form, for example, four travel lanes reduced to three or two.

4. The entire TOD Overlay Plan is based on a non-Euclidean methodology, which takes the attributes of individual properties into account.

Parking:

1. The intent is to increase pedestrian activity, which would result in greater foot traffic and more exposure for small businesses.

Traffic Signal System:

1. The EIS is a disclosure document.

2. The timing of traffic signals is the responsibility of the City and County of Honolulu Department of Transportation Services for City streets and the State DOT for Ala Moana Boulevard. These agencies are constantly making adjustments to the system, but must coordinate for longer-term studies. It is not known when they might undertake a larger analysis.

Summary Description of Baseline Condition:

1. The EIS is a disclosure document.

2. A Supplemental EIS may be necessary if HCDA considers increasing FAR beyond what is already allowable under the Mauka Rules and the final TOD Overlay Plan.

Comparing Baseline and Alternatives:

1. General Area Mauka is a summary category. There are only three sites.

2. It does. You have misread Table 2.1.

3. Please see discussion under Section 2.3.2.1 of Chapter Two. Hotel development will benefit commercial areas such as the Ward commercial areas and the Blaisdell property by increasing the daily census of those areas.

Population Comparison 2035:

1. Please see the extensive discussion of methodology in Appendix G.

2. Both. As Kakaako becomes a more popular commercial destination, more commercial activities will appear. This has been the recent case for new restaurants in the area. The introduction of rail to area will help accomplish this.

3. A healthy community includes a variety of accessible land uses, especially those commercial uses that directly benefit residents. This is not inconsistent with the intent of 206E.

4. It is beyond the authority of the State to regulate how an apartment owner may choose to occupy their unit or sub-let it to others.

Topography, Geology, Soils:

1. The EIS is a disclosure document.

2. This is beyond the scope of the EIS, and will be determined by individual landowners at the time they choose to develop their property.

3. There are many development projects that do not trigger environmental assessment. This EIS presents a programmatic-level review. Other mechanisms, such as an NPDES permit,

grading permit, or building permit, are intended to address more specific impacts.

4. We respectfully disagree. The importation of soil for use as fill material is not a trigger identified in Chapter 343.

Comparing 2035 Traffic:

1. The Makai Area is not being proposed for TOD projects, but it does have roadways within it that are part of the overall traffic network.

2. See Response #1.

Table 4-15 - Travel Demand Comparison:

1. People.

Table 4-18:

1. The EIS is a disclosure document.

2. The EIS is a disclosure document.

3. The TOD Overlay Plan will contribute additional traffic to some areas.

4. The intention of the City's rail project is to provide a method of alternative transportation that will help to reduce automobile congestion along key corridors.

5. Not all impacts can be mitigated. However, by focusing on Complete Streets and improving pedestrian and bicycle access, the TOD Overlay Plan is proposing to reorganize transportation mode priorities, and therein, influence people's choices.

6. The appropriate sections on Air Quality and Traffic in Chapter Four do this.

7. The City's DTS is responsible for intersections within the KCDD and the State DOT is responsible for intersections on Ala Moana Boulevard.

Health Care:

1. They are on-going.

2. The EIS is a disclosure document.

3. The character of future TOD projects rests with the choices made by individual landowners. The market will respond to demand as needed. It will be up to the City to determine where it might choose to locate a new EMS unit.

Public Emergencies:

1. The EIS is a disclosure document.

2. The EIS is a disclosure document.

3. If additional fire fighters are not provided to meet future projected demand, response times may increase. The purpose of an EIS is to identify early on what future needs may be. It is then up to government to address those identified needs.

4. The EIS is a disclosure document.

5. It will be up to the City to make those determinations. The EIS identifies the need, which is the first step towards solving the problem.

6. We feel that Appendix G adequately discusses these concerns. If vital services are not provided, service times will likely increase.

Air Quality:

1. The use of lawnmowers and similar types of exhaust producing equipment for landscape maintenance can affect air quality.

Urban Design:

1. The EIS is a disclosure document.

2. The EIS addresses these impacts in the appropriate sections of Chapter Four.

3. A site is "entitled" when development permits are granted.

4. Chapter Four identifies the impacts of implementing Alternative A and B. The change of visual character is largely an aesthetic issue and is disclosed in the EIS to the extent required.

5. See Response #2 above.

6. Please refer to Response #9 under the Housing category above.

Light and Glare:

1. Trees and hedges.

2. A 24-hour active area does not mean that all businesses are open all the time. Safety lighting can be accomplished by directional lighting or shielded lighting rather than flood lighting.

3. Limiting hours of illumination is intended to address such matters as commercial activities and the lighting of external facades, to name a few.

Relationship to Land Use Plans:

1. The livability of a community, in terms of pedestrian friendliness and accessibility of the streetscape contributes to social well-being. Please refer to the discussion on page 2-2 of Appendix A.

2. See Response #1 above.

3. The identified view corridors are generally consistent with existing mauka-makai roadways. Section 226-12 is not intended to prohibit development of all property.

4. In promoting LEED certification for new development, HCDA intends to address concerns about water conservation and the productive use of runoff.

State Ocean Resources Management Plan:

1. The KCDD is an existing urban area that is serviced by an existing drainage system. As such, runoff will continue to be generated. The EIS discloses this. Promoting alternative transportation modes is one way of improving ocean water quality because it can help to reduce petro-chemical releases on roadways.

2. Public shoreline vistas at Kakaako Waterfront Park are currently limited to lateral views because the mounds in the park prohibit mauka view from the shoreline. TOD projects in the Mauka Area will not impact lateral views along the shoreline.

Environmental Protection Act:

1. The EIS is a disclosure document. Please refer to the discussion under Section 4.10.13 in Chapter Four.

2. The entire EIS document is devoted to addressing these impacts. In particular, please refer to Appendices C and G.

3. As an existing high-density urban area, the KCDD is admittedly limited in the provision of natural environment that is uniquely Hawaiian. This has been the case since the mid-1900s. Recycling of wastewater will be addressed on a project by project basis. The provision of open space is an important aspect of any new development and will be addressed by rules to be enacted for the implementation of TOD. The lifestyles of urban residents will be improved through the implementation of the Complete Streets program as discussed in the EIS. The intent of the TOD Overlay Plan is to improve the urban environment.

County Plans:

1. As a high-density urban area, the Mauka Area of Kakaako includes virtually nothing that could be described as "natural environment". Thus, no natural environment would be undermined by TOD.

2. As discussed in the EIS, the provision of affordable housing is a principal goal of HCDA.

3. As discussed in the EIS, the HCDA is actively addressing concerns about recreational space under a separate master planning process.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

Kakaako Community TOD Draft EIS - Joint Letter from Area Legislators
Lam, Doris
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1 Attachment

Jt Letter - Kakaako Community TOD Draft EIS.pdf

Aloha Director Ching,
Attached please find joint letter from Area Legislators submitting comments to the Kakaako Community TOD Draft EIS.
If you have additional questions, please do not hesitate to contact our office.
Thank you.
Doris

Doris Lam
Office Manager
Office of Councilmember Carol Fukunaga
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February 23, 2015

Anthony Ching, Executive Director
Hawaii Community Development Authority
461 Cooke Street
Honolulu, HI 96813

RE: Comments Regarding the Kakaako Community Transit Oriented Development Draft EIS

Dear Director Ching,

Thank you for the opportunity to provide comments and address community concerns related to the *Kakaako Community Transit Oriented Development Overlay Plan's Draft Environmental Impact Statement.*

We welcome the opportunity to expand upon the positive benefits of more walkable, and sustainable neighborhoods in urban Honolulu. At the same time, we observe that the *Draft EIS* contains a number of areas that lack adequate discussion or information upon which to make substantive policy decisions that will affect existing residents and businesses. Specifically, we focus on areas of incomplete or insufficient information and analysis relating to: a) impacts upon small businesses in Central Kaka'ako, b) adequacy of transportation/roadway improvements, c) adequacy of recreational/open space requirements, and d) adequacy of public infrastructure systems.

Impacts upon Central Kakaako Industrial Zone Small Businesses
As noted in the August 22, 2008 comments submitted by Senators Chun Oakland, Fukunaga and Slom, and Representatives Brower and Rhoads, we are concerned that the *Kakaako Community Transit Oriented Development Draft EIS* does not address how the proposed zoning changes associated with TOD Alternative A or TOD Alternative B, and related transportation changes will affect small businesses within the Central Kakaako industrial zone.

On one hand, adoption of a more comprehensive "Complete Streets" program to make streets more pedestrian-friendly and promote multi-modal transportation alternatives includes streets within the Central Kakaako industrial zone as candidates for street widening and sidewalk improvements: these include portions of Queen Street west of Ward Avenue (primary), Halekauwila Street (primary), Queen Street east of Ward Avenue (secondary), Ilaniwai Street (secondary), Dreier Street (secondary), Waimanu Street (secondary) and Ahui Street (secondary), source: *Figure 4-20, Proposed Pedestrian Priority Streets, page 106.*

On the other hand, for businesses on these streets who rely upon parking in front of their establishments for their particular customer or service base (e.g., auto repair shops, etc.), adoption of a requirement for wider sidewalks can also mean the loss of square footage from which to conduct their businesses, or loss of readily-available customer parking.

The *Draft EIS* should address the following questions:

1. What criteria were used to select the primary and secondary pedestrian priority streets identified in *Figure 4-20*?

2. Have the *Draft EIS* consultants met with Central Kakaako small business owners and property owners to identify concerns associated with implementation of 'Complete Streets' pedestrian-friendly features like wider sidewalks?

3. If yes, what alternatives have the *Draft EIS* consultants explored to implement pedestrian-friendly modifications to the designated streets that may reduce the likely impact of pedestrian-friendly modifications upon area businesses?

4. What alternatives have the *Draft EIS* consultants explored to mitigate against potential business loss or other adverse impacts associated with 'Complete Streets' features along their designated streets? If they have not done so, they should meet with businesses along these designated streets to determine what potential adverse impacts might result from adoption of the recommendations for pedestrian-friendly priority streets.

<u>Adequacy of Transportation Impacts Analysis</u>
According to the comparisons of Year 2035 and existing travel mode/trip generation conditions in the *Draft EIS* (*pages 218-19, Table 4-11: Travel Mode Comparison, Year 2035 vs. Existing*), total trips by all modes of transportation to, from and within the study area will double as a result of expected development within the Future Baseline Condition, with traffic within the district increasing by one-third.

As such, it is difficult to understand why the *Draft EIS* fails to quantify the extent of public roadway improvements needed to improve traffic flow within the Kakaako Community Design District (KCDD).

For example, *Figure 4-14, Planned and Proposed Network Changes (Future Baseline Condition)*; *Figure 4-17, Proposed Street Connections: Proposed Action* (establishing two-traffic patterns for Piikoi-Pensacola, new street connections, service roads and pedestrian-only roads); *Figures 4-18, Proposed Motor Vehicle Priority Streets, 4-19, Proposed Bicycle Priority Streets,* and *4-20, Proposed Pedestrian Priority Streets* identify proposed improvements to the vehicular, bicycling and pedestrian flow within the district, but there is no identification of the costs of adopting the proposed actions.

The Draft EIS should address the following questions:

1. What are the estimated costs of adopting the proposed improvements/actions identified in *Figures 4-14, 4-17, 4-18, 4-19 and 4-20*, and which agencies and branches of government would be responsible for their implementation?

2. In your response to Question 1, please provide the criteria or basis for determining which agencies and jurisdictions are responsible for implementation costs. During the past two decades, HCDA and the State Legislature funded most, if not all, of the roadway improvements associated with Improvement Districts 1 through 10. What financing strategies is the EIS consultant proposing for implementation of traffic improvement actions identified above?

3. Will the adoption of the proposed improvements identified in *Figures 4-14 through 4-20* assist in mitigating traffic congestion conditions identified for the following streets, whose conditions are at LOS E or LOS F during peak traffic flow periods: a) Ala Moana & South, b) Ala Moana & Keawe, c) Ala Moana & Coral, d) Ala Moana & Cooke, e) Ala Moana & Koula, f) Ala Moana & Ward, g) Queen & Ward, h) Kapiolani & Ward?

   If not, why not? What improvements can be made to address the LOS E or LOS F conditions associated with the above-listed streets, which would continue in spite of Proposed Action listings from *Figures 4-14 through 4-20*?

4. Has the *Draft EIS* consultant evaluated other regional traffic analyses for congestion remedies that include access to and from the H-1 Freeway, and including such neighborhoods as Waikiki, Ala Moana, McCully-Moiliili, Downtown to Nuuanu/Liliha in terms of traffic flow associated with H-1 Freeway usage? If not, why not?

<u>Adequacy of Regional Parks and Open Space Requirements</u>
The section on Public Parks and Grounds contained in *Section 4.6.3.3, Public Parks and Grounds (page 190)* is cursory at best, and fails to address the deficiency in public recreational space for the Ala Moana/Sheridan and Kakaako region that we originally discussed in response to the *2008 Draft Mauka Area Plan*:

> *"The DMAP Draft SEIS identifies the grossly-inadequate level of public park spaces within Kaka'ako mauka, e.g., with only nine acres of existing park space (five acres are public) in conjunction with the City & County of Honolulu's parks planning standard of two acres of park space for every 1,000 residents of an area. Meeting City & County standards would mean that 60 acres of park spaces are needed for the Kaka'ako mauka area, which means that the projected park spaces for Kaka'ako mauka are deficient by over 50 acres." (August 22, 2008 Comments, Draft Mauka Area Plan).*

We therefore raise the following questions:

1. Has the EIS consultant considered expanding upon public recreational improvements to address the paucity of existing public recreational space by identifying Thomas Square, b) Neal Blaisdell Center, c) Kaka'ako Waterfront Park, d) Ala Moana Regional Park, e) Kewalo Basin Park, and f) other Kakaako Makai lands transferred to Office of Hawaiian Affairs as areas that may be suitable for expanded public recreational uses and development?

2. If not, why not? If yes, please provide examples of financing arrangements that other cities and states have pursued to leverage public recreational lands for maximum public benefit and use.

Adequacy of Regional Public Infrastructure Systems
The *2008 Draft Supplemental EIS Mauka Area Plan (Vol. 1)* noted that HCDA's Improvement District (ID) program helped to implement roadway and utility improvements within the Kakaako District.

The program was funded largely through the State legislature, with contributions from property owners and public utility companies, and focused on reconstructing and/or widening streets, installing streetlights, curbs, gutters, and sidewalks, improving drainage, sewer and water systems, and upgrading and undergrounding electrical power and telecommunication.

Over $203 million dollars was expended by the State/HCDA to complete 10 ID projects, 5 of which were within or partly within the Mauka Area and the rest located in the Makai Area. (*2008 DSEIS, pages 2-25*).

The infrastructure evaluation noted that total costs for improving the district, including upgrading sewer and water systems, increasing electrical power systems and communications systems, were estimated at approximately $ 113,701,000. (*2008 DSEIS, page 2-28*). Most of the estimated costs of regional infrastructure upgrades identified in 2008 have not been undertaken by the HCDA through requests for legislative funding or other financing methods between 2009-present.

A. Hydrology and Storm Drain Systems
In 2008 the estimated cost to make drainage improvements in the Kakaako Mauka area was estimated at $5,549 million dollars. The *Kakaako TOD Overlay Draft EIS* notes that "the existing drainage system is inadequate to accommodate and dispose of design storm rainfall runoff quantities in both existing and future conditions." *(TOD Overlay, Draft EIS, page 248).*

We raise the following questions regarding the incomplete nature of the information provided:

1. What are the projected costs to correct the existing drainage system deficiencies for storm rainfall runoff quantities for present and future conditions?

2. What steps has the HCDA taken since 2008 to address existing drainage system deficiencies for that portion of the Kakaako Mauka area in which the drainage system is inadequate?

3. Are most of the existing drainage system deficiencies located in Central Kakaako, where Improvement District-11 was previously proposed as the next step towards state upgrades to the infrastructure?

4. If yes, what actions can the State HCDA and appropriate city agencies take to address existing system deficiencies and mitigate those deficiencies?

5. What corrective and mitigation actions should the State HCDA and appropriate city agencies take regarding storm water/drainage system deficiencies to meet the development timetable for residential housing and other projects that the HCDA has approved since 2008 in the Kakaako Mauka area?

B. Sanitary Sewer Systems
In 2008, the estimated total cost to improve sewer systems in the Kakaako area was $49,482 million dollars.

The *TOD Overlay Draft EIS* cites an *October 15, 2014 Economic Impact Assessment (Table 7.10)* in restating the same public infrastructure costs, and noted that the 2008 sewer infrastructure improvement costs for Kakaaka Mauka were $49,482 million dollars, whereas *Table 7.10* included a correction to that amount in 2012 dollars, or $53,938,733 million dollars.

However, a 2014 *"Adjustment"* reduced the expected cost by $50 million dollars to $3,253,120.00. A footnote in *Table 7.10 (e)* states, "Large differences between 2009 EIS and 2014 adjustments for water and particularly sewer are explained in Belt Collins report for this EIS." The report makes no reference to the location of this information.

In *Appendix K,* the *Kakaako Sewer Master Plan's* update (prepared by Belt Collins in December 2014), "Opinions of Probable Costs," proposes a number of mitigation measures related to surcharged sewers, with a future baseline cost of $3,400,000 (rounded).

We therefore have the following questions regarding the sanitary sewer systems:

1. What are the projected costs to upgrade the existing sanitary sewer systems, as identified in the *2009 Mauka Area Infrastructure Plan* (MAIP)?

2. What is the basis for the December 2014 modifications in estimated costs to upgrade the sanitary sewer systems, which were initially calculated at $49,482 million dollars in 2008?

3. The *TOD Overlay Draft EIS* states that the City Department of Environmental Services and City Department of Design and Construction have only recently

received the *2009 Kakaako Mauka Area Infrastructure Plan* (MAIP), and neither has reviewed the Plan's improvements, nor included the projected sewer flow into the City's own projections for Sand Island Wastewater Treatment Plant projections (*TOD Overlay Draft EIS, page 248)*. What is the reason for the delayed delivery of the 2009 MAIP to City agencies?

4. Have the HCDA and the City Department of Environmental Services and City Department of Design and Construction identified alternative technology solutions for sanitary sewer system upgrades to meet the needs of residential housing and other projects that the HCDA has approved in the Kakaako Mauka area since 2008?

5. *Appendix B (pages 27-28)* of the *Draft EIS* identifies the need for a comprehensive vulnerability assessment and mitigation plan for the Kakaako Community Development District. Which state or city agency would be responsible for undertaking such a study on behalf of the HCDA? Would such a study be required to meet federal requirements (e.g., flood insurance, etc.) and related requirements? If yes, has this requirement been discussed among city, state and other regulatory agencies, and what is the timetable for development of such a comprehensive vulnerability assessment and mitigation plan?

6. What actions should the State HCDA and appropriate city agencies take regarding sanitary sewer system upgrades to meet the development timetable for residential housing and other projects that the HCDA has approved since 2008 in the Kakaako Mauka area?

C. Solid Waste Disposal Program

The *TOD Overlay Draft EIS* states, there are "no existing or proposed solid waste disposal facilities located within the Mauka Area. All collected solid waste is disposed of outside the Mauka Area; at refuse transfer stations, recycling centers, composting/mulch sites, the Waimanalo Gulch Sanitary Landfill, the H Power plant in Campbell Industrial Park, other State Department of Health permitted facility, such as the PVT landfill in Nanakuli." (*TOD Overlay Draft EIS, p 373*).

We have the following questions regarding the solid waste disposal system:

1. What is the estimated range of solid waste disposal needs for which the EIS consultant reports that no disposal facilities are located in the Mauka Area?

2. What is the estimated cost for privately-contracted collection services to meet the expansion of solid waste disposal needs in Kakaako's Mauka Area? Will privately-contracted collection services be sufficient to handle residential, commercial and/or industrial needs under both the TOD Alternative A and B proposals?

D. Water Systems

In 2008, the *Draft EIS* estimated that the cost to improve water systems in Kakaako Mauka area was $4,700,000. The *TOD Overlay Draft EIS* identifies

approximately 37,600 linear feet of existing 6 and 8 inch diameter water mains will be needed to upgrade to 12 inch diameter mains to accommodate fire flow requirements.

We have the following questions regarding the adequacy of the information provided:

1. What are the projected costs to upgrade the existing water systems, particularly with respect to water lines located in central Kakaako?

2. What actions should the State HCDA and appropriate city agencies take regarding water system upgrades to meet the development timetable for residential housing and other projects that the HCDA has approved in the Kakaako Mauka area since 2008?

Thank you for the opportunity to submit the foregoing comments. We look forward to further public review of the *Kakaako TOD Overlay Draft EIS*.

Sincerely,

Carol Fukunaga

Councilmember Carol Fukunaga
District 6 (Makiki/Punchbowl, Tantalus, Chinatown Kaka'ako, Nuuanu, Liliha-Alewa-Kalihi Valley-Alea)

Suzanne Chun Oakland

Senator Suzanne Chun Oakland
District 13 (Liliha, Palama, Iwilei, Kalihi, Nuuanu, Pacific Heights, Pauoa, Downtown, Chinatown)

Tom Brower

Representative Tom Brower
District 22 (Waikiki, Ala Moana)

Scott K. Saiki

Representative Scott Saiki
District 26 (McCully, Kaheka, Kaka'ako, Downtown)

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Ref. No.: PL TOD 18.3

June 10, 2015

The Honorable Carol Fukunaga
Councilmember, Council District 6
Honolulu City Council
Honolulu Hale
530 South King Street, Room 202
Honolulu, Hawaii 96813

The Honorable Suzanne Chun Oakland
Senate, District 13
Hawaii State Capitol, Room 226
Honolulu, Hawaii 96813

The Honorable Tom Brower
House of Representative, District 22
Hawaii State Capitol, Room 315
Honolulu, Hawaii 96813

The Honorable Scott K. Saiki
House of Representative, District 26
Hawaii State Capitol, Room 434
Honolulu, Hawaii 96813

Dear Councilmember Fukunaga, Senator Chun Oakland, and Representatives Brower and Saiki:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 23, 2015 commenting on the above document. Following are responses to your comments in the order they were presented in your letter.

Impacts on Central Kakaako:

At the top of page two of your letter, you suggest that adoption of a requirement for wider sidewalks can also mean the loss of square footage from

which businesses conduct their business, or a loss of ready-available customer parking.

As indicated in the Note section of Figure 4-20, "Recommendations in the Draft TOD Overlay Plan are only strategies and not required improvements". The Draft EIS does not indicate the amount of space to be reallocated for pedestrian movement, the specific type and location of each pedestrian improvement to be constructed on each street, or whether parking will be lost. A separate transportation design process will be necessary to develop conceptual and engineering designs, make design decisions, and weigh modal and street use tradeoffs.

As noted in Appendix D of the Draft EIS, "HCDA has worked with the Central Kakaako community and determined that the industrial character of the area should remain". In some cases, the industrial character of streets are preserved by creating shared street environments that provide more formal parking stalls, rather than haphazard parking arrangements that exist today that can be unsafe or uncomfortable for people walking along the street or to commercial locations. Streets where a shared street application may be appropriate include Waimanu Street, Kawaiahao Street, Queen Street, Hopaka Street, Coral Street, Kona Street, Cummins Street, Kamani Street, and Ilaniwai Street.

Furthermore, the parking analysis conducted as part of the Draft TOD Overlay Plan by HCDA's Transportation consultant, Nelson\Nygaard, indicates that the existing supply can be optimized in order to accommodate current parking demand.

1. The following criteria were employed to develop the pedestrian priority network:

   - Existing and anticipated pedestrian demand as a result of future redevelopment;
   - Key HART access streets for people walking to rapid transit stations;

- Retail access or retail streets should prioritize pedestrian movement and create a welcoming environment to people walking to and between commercial/retail locations; and
- Locations where walking might be uncomfortable or where existing pedestrian infrastructure is inadequate for current or future demand.

2. The Draft EIS transportation consultants did not conduct individualized outreach to every potentially affected business. This is due in large part because the precise design details of streets recommended for pedestrian priority designation would not be known until more detailed corridor redesign processes commence. Only the range of potential pedestrian improvements was provided in the Draft EIS. Stakeholders (including the business community and interested community members) had the opportunity to attend several open houses to provide input, offer ideas, and voice concerns. This level of outreach conducted by both the Draft EIS transportation consultant and HCDA was sufficient to gather business input related to pedestrian improvements and potential parking loss.

3. Please see response #4.

4. No alternatives have been developed. The pedestrian improvements are sufficient to ensure safe and comfortable pedestrian movement in the advent of a threefold increase in daily pedestrian crossings with no commensurate or appropriate increase in pedestrian capacity. Likewise, the Complete Streets network approach developed in the Draft TOD Overlay Plan and accompanying Draft EIS provides designated parking access streets to help limit search-for-parking traffic and reduce parking search times. Because every street in Central Kakaako cannot serve every purpose to every user, the transportation consultant established parking access

and on-street parking supply priorities along strategic streets. That said, on-street parking will likely remain on many pedestrian priority streets and in cases where limited parking supply removal might be proposed during the implementation phase, existing and future off-street parking supply will accommodate parking demand.

Adequacy of Transportation Impacts Analysis:

Near the bottom of your page 2, you state, "As such, it is difficult to understand why the Draft EIS fails to quantify the extent of public roadway improvements needed to improve traffic flow with the Kaka'ako Community Design District (KCDD)."

The rationale of employing a Complete Streets network and design approach to the Kakaako Community Development District (KCDD) was twofold: (1) to help achieve the community and livability goals of the TOD Overlay Plan and (2) to increase the person carrying capacity of the network, rather than the vehicle carrying capacity. The Draft EIS's proposed improvements address traffic flow by enhancing the quality of service to transit, walking and bicycling to encourage people to shift to alleviate motor vehicle traffic demand. The TOD Overlay Plan's proposed improvements respond to shifting demands in the presence of denser urban development and more robust pedestrian, transit and bicycle networks (including the impact of HART). These shifting demands correspond to a decrease in total daily motor vehicle trips from 77.3% under Existing Conditions to 71.3% of under the Future Baseline Condition and 69.6% under the TOD Alternative A/B. Thus, TOD Alternative A/B provides far greater benefit to traffic capacity and flow by reducing the total number of daily motor vehicle trips traveling to and throughout the KCDD.

Likewise, the impact of pursuing additional traffic flow and vehicle capacity improvements employed in the Baseline Condition (in the form of roadway widening and increased turn lane capacity) would present significant impacts on adjacent land uses (in the form of takings, potential parking loss, and

reduction of sidewalk capacity for pedestrian access, shop displays, café seating, etc.) compared to the TOD Alternative A/B proposed mitigations. Roadway widening and turn lane capacity mitigations would also present far higher capital costs compared to the TOD Alternative A/B's person carrying capacity mitigations.

1. Figure 4-14 presents the original roadway changes proposed in the Kakaako Mauka Area Plan Supplemental EIS Transportation Analysis (produced by the consultancy EDAW, Inc., dated April 14, 2009). The design assumptions necessary to provide cost estimates are not available to the Draft EIS consultants and, as such, cannot be produced. Figures 4-17 through 4-20 present proposed network changes and modal street priorities. These priority designations do not include specific design details and, as such, could not accurately have cost estimates applied. However, the Draft EIS consultants developed typical cross sections for the proposed mitigations located in Appendix D of the Draft EIS. These cross sections illustrate the proposed changes to streets with recommended mitigation measures for the Proposed Action. Streets with varying sidewalk widths are illustrated with ranges. All cross sections are conceptual and would require further engineering study prior to implementation.

   Based on these cross sections, the following high level, order-of-magnitude cost estimates have been developed. These costs include capital costs, labor, construction engineering, survey and design, contingency, and project administration, cost estimates do not constitute engineering-level cost estimates and, depending on level of utility removal/relocation, right-of-way acquisition, and other major cost factors, may vary significantly from the costs listed below.

   - Ward Avenue: $300,000
   - Cooke Street: $140,000

   - South Street Protected Bike Lanes: $250,000
   - Punchbowl Street Protected Bike Lanes: $240,000
   - Central Kakaako Industrial Shared Streets: $6,600,000 (Includes segments of the following streets with curbless street design: Waimanu Street (2,525 ft), Kawaiahao Street (2,585 ft), Queen Street (2,275 ft), Hopaka Street (1,070 ft), Coral Street (455 ft), Kona Street (1,350 ft), Cummins Street (430 ft), Kamani Street (715 ft), and Ilaniwai Street (1,190 ft).);
   - Pedestrian crossing improvements (along all corridors): $4,600,000
   - Ala Moana Shared Use Path: $1,300,000
   - Pensacola Street Restriping/Bike Lane: $290,000
   - Piikoi Street Restriping/Protected Bike Lane: $305,000
   - Halekauwila Street Cycle Track: $330,000

   Implementation of the proposed improvements/actions will likely occur through a number of different funding mechanisms or sources, including HCDA, State Legislature allocated funds, OMPO allocated funds, the City and County of Honolulu (to a lesser extent), Hawaii Department of Transportation (to a lesser extent), and any number of the grant opportunities. Grant opportunities might include MAP-21 Transportation Alternatives Program (TAP), MAP-21 Recreational Trails Program (capital and O&M), Transportation Investment Generating Economic Recover (TIGER) Grant Program, FTA 5307 access to transit funding (1% of total funding requirement), CDC DP14-1417 Partnerships to Improve Community Health, and HUD/DOT/EPA Partnership for Sustainable Communities grants, among others. Private developers would also be funding partners, helping to pay for pedestrian improvements that directly affect their development sites.

2. The list of funding sources and mechanisms is based on common funding options available for similar project in other places and the likely jurisdiction partners that would likely fund one or more proposed improvements. No financing plan was developed for this EIS as each project would likely be implemented on a piecemeal basis, which is subject to funding availability at the time of implementation, and the timing is presently unknown.

3. Proposed improvements in Figures 4-14 through 4-20 will assist in mitigating traffic congestion by increasing the person carrying capacity of streets, creating environments that support trips made via HART rail and improving connections to HART. Table 4-22 lists proposed actions that will mitigate the impact of LOS E and F affected intersections. Two intersection have potentially substantial and unavoidable impacts: Queen & Ward and Kapiolani & Ward.

4. The TOD Overlay Plan acknowledges the importance of the H-1 freeway to regional connectivity and the Draft EIS ensures proposed mitigation measures do not significantly impact ingress and egress to on-and off-ramps. Likewise, the TOD Overlay Plan develops strategies and proposed improvements to support regional rail trips via HART and internal trip capture that take trips off of the H-1 freeway.

Adequacy of Regional Parks and Open Space Requirements:

1. As discussed in Section 6.6 of Chapter Six, HCDA is presently engaged in outreach concerning the preparation of a Parks Master Plan to address recreational needs in the KCDD. As the outcome of this process is at this point in time unknown, the current EIS identifies the matter as an Unresolved Issue. Decision-making concerning the parks you identify cannot occur until our park master planning effort is completed. For this reason, the matter of expanding public recreational uses was not more fully addressed in the EIS. Figure 4-8 in Chapter

Four of the EIS identifies already committed privately developed and maintained public spaces as well as potential future private and public developments that can expand public open spaces in the KCDD.

2. See response above. In light of our current efforts, the issue of financing arrangements for the purpose of leveraging public recreational lands for maximum public benefit and use is clearly pre-mature for the purposes of the TOD EIS, and will likely be addressed by HCDA under the umbrella of its parks master planning effort.

Adequacy of Regional Public Infrastructure:

A. <u>Hydrology and Storm Drain Systems</u>

1. Per the City's Storm Drainage Standards, any increase in storm water runoff generated within the property shall be retained or disposed of on-property; commonly referred to as a "no net increase" in runoff. As there will be no net increase in runoff due to the developments within the Kakaako Mauka Area, there will be no net impact to the City's drainage system. Therefore, the determination of where the existing drainage system deficiencies are and what is required to correct the deficiencies is being left to the City. Anticipated mitigation actions are suggested in Item 5 response, below.

2. We have not taken any steps to address existing drainage system deficiencies within the Kakaako Mauka Area since 2008.

3. The existing drainage system deficiencies are NOT solely located where Improvement District 11 was proposed. It

is noted that Improvement District 11 scope of work only addressed localized drainage deficiencies; such as for localized ponding and installation of curbs, gutters and sidewalks.

4. The existing drainage deficiencies result from storm water runoff generated from lands mauka of the Kakaako Mauka Area, when combined with runoff generated from the Kakaako Mauka Area, being larger than the amount that can be conveyed thru the existing drainage system within the Kakaako Mauka Area. A Regional Drainage Master Plan encompassing land upslope of the Kakaako Mauka Area would need to be prepared, which would then become the basis for determining the required drainage infrastructure improvements and projected costs. As there are multiple jurisdictions involved, HCDA, State Department of Transportation, and the City's Department of Environmental Services to name a few; determining which entity would take the lead and prepare the Regional Drainage Master Plan would need to be discussed and agreed to.

B. Sanitary Sewer Systems

1. As noted in Table 7.10, the projected cost to upgrade the existing sanitary sewer system as identified in the 2009 Mauka Area Infrastructure Plan (MAIP) is approximately $53,938,733 in 2012 dollars.

2. The basis for the Draft EIS sewer system infrastructure costs was the Sewer Master Plan Update for the Kakaako Mauka District (Sewer Master Plan), which was included as Appendix K in the Draft EIS. The specific mitigation measures and costs were provided on Page 9, Table 8:

Opinion of Probable Construction Costs. The major difference between the Sewer Master Plan and the 2009 MAIP is that the Sewer Master Plan includes the City's proposed diversion of sewage flow from the 60" Ward Avenue trunk. The Sewer Master Plan computations included a minimum diversion amount of 27 million gallons of sewage per day, which would alleviate surcharged conditions in Ward Avenue, Auahi Street, and South Street.

3. The 2009 MAIP was transmitted to the City's Department of Planning and Permitting (DPP) on October 31, 2012. On March 1, 2013, Belt Collins, HCDA's engineering consultant, clarified that the October 31, 2012 transmittal included the sanitary sewer (wastewater) master plan, for which review was requested.

4. During Belt Collins' discussions with ENV, the topic of alternative technology solutions for sanitary sewer system upgrades was not broached. HCDA has not had discussions with the City Department of Design and Construction relative to sanitary sewer system upgrades.

5. Appendix B (pages 27-28) – The City's DPP would be the likely agency to lead a vulnerability assessment for greater Honolulu. HCDA would participate in the study to the extent necessary to address issues in Kakaako. The Federal Government developed the flood insurance rate maps (FIRM) that determined the land areas requiring flood insurance and established the base flood elevations (BFE); no additional studies are required by the Federal Government. However, if a development will impact the BFE, then the DPP will require the developer to prepare

additional studies and prepare a letter of map revision to revise the FIRM, if necessary.

6. Belt Collins prepared the Sewer Master Plan for HCDA, which specifies the sewer system upgrades necessary to service the planned development within the Kakaako Mauka Area, and transmitted it to the City Department of Environmental Services (ENV) and to the DPP as these agencies are jointly responsible for reviewing and approving the Sewer Master Plan. Based on the approved Sewer Master Plan, DPP will either inform the sewer service requestor that their sewer connection application has been approved or not; in which case the sewer service requestor would need to coordinate with ENV to determine the minimum sewer improvements necessary for the proposed construction. The above outlined actions will assist proposed developments meet their development schedules.

C. Solid Waste Disposal Program

1. The increase in solid waste generation is estimated to range between 59,000 and 75,000 tons per year; or 214% to 244% respectively. The calculations account for the land uses represented in the water/sewer master plan analyses (i.e., residential/hotel, civic/office, industrial, and commercial/retail), for the existing, future, TOD A and TOD B scenarios.

2. The cost for privately-contracted collection services are typically paid for by the development or lessee and not by the City and County of Honolulu or State of Hawaii; and, therefore, not included in the Draft EIS. HCDA anticipates that the demand for privately-

contracted collection services will drive existing companies to expand in size or allow new companies to compete; thus meeting the needs within the Kakaako Mauka Area.

D. Water Systems

1. The projected costs of $41,900,000 to upgrade the existing water system within the Kakaako Mauka Area are noted in the Water Master Plan Update, HCDA Kakaako Mauka District (Water Master Plan), which was included as Appendix J in the Draft EIS; in Section 4 Opinions of Probable Cost.

2. Belt Collins prepared the Water Master Plan for HCDA, which specifies the water system upgrades necessary to service the planned developments within the Kakaako Mauka Area, and transmitted it to the Board of Water Supply (BWS) for review, comment, and eventual approval. Based on the approved Water Master Plan, BWS will inform the water service requestor of the minimum improvements required in order to obtain BWS approval of the proposed construction. BWS's minimum required improvements will probably consist of water main installation from the project to the closest existing 12-inch water main. The above outlined actions will assist proposed developments meet their development schedules.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

Kaka'ako Ūnited

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HAWAII COMMUNITY DEVELOPMENT AUTHORITY

February 22, 2015

To: Hawai`i Community Development Authority
461 Cooke Street
Honolulu, Hawai`i 96813

From: Sharon Moriwaki
Kaka'ako United

Subject: Comments on the TOD Overlay Plan Draft Environmental Impact Statement (DEIS)

For the volume of information provided in the 1,152-page DEIS issued on January 8, 2015, and without previous meaningful engagement of the community in the development of the TOD Overlay Plan, 45 days is is too short a period for community residents and the public to carefully review its contents and to provide written constructive and usable comments on a proposed action of such magnitude and significance.

The Draft Environmental Impact Statement ("Statement") should disclose the environmental effects of a proposed action, effects of a proposed action on the economic welfare, social welfare, and cultural practices of the community and state, effects of the economic activities arising out of the proposed action, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects.

In reviewing the DEIS, we found far more unanswered questions to the proposed action than information to on the impacts and the mitigation measures to address significant adverse or potentially adverse impacts on the Kaka'ako Community Development District ("KCDD") environment, residents, and businesses.

The following provides our comments and questions, and look forward to having them addressed pursuant to HAR Sections 11-200-18 and 11-200-22.

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KŪ

Ensuring the quality of life for an integrated Kaka'ako community from mauka to makai.

General Comments on the Statement

1. The Statement's discussion of "social impacts" generally describes only positive results of the TOD Overlay Plan, promoting the TOD concept. While there may be some merit to this argument, it is not balanced with what are likely to be direct and indirect adverse consequences that are contrary to the purposes expressed in Chapter 206E, HRS, for the KCDD. One major impact is the loss of small industrial service businesses due to economic and financial pressures brought about by the TOD, including diminished business activity during lengthy and nearly continuous construction and rising land values that drive up property tax assessments.

   Also, increased development potential allowed by the TOD tends to favor larger properties. Most of Central Kakaako's small properties are excluded from the TOD Overlay zone so they do not reap the purported benefits of density bonuses, but they surely will be negatively affected by them. Where is the analysis of these impacts in the DEIS and what mitigation measures are proposed to help retain small businesses, especially those of an industrial service nature? The Statement does not address this critical part of the community and how it will be preserved and enhanced. Not only is the preservation of these businesses contained in HCDA's governing statute, chapter 206E, HRS, it is in the Hawaii State Plan, specifically stating that a priority guideline to effect desired growth distribution and land resource utilization is the support of the redevelopment of Kaka'ako into "a viable residential, *industrial*, and commercial community." Section 226-104(8), HRS.

2. The TOD Overlay is an ambitious plan that calls not only for increased density on private properties, but also extensive right-of-way and other infrastructure improvements. There is no clear plan for how these improvements will be financed and over what period of time. Given the scope of the proposed construction activity necessary to implement the plan, it is difficult to accept the characterization of the construction activity as "short-term" since it is likely to occur over several decades. Certainly the history of the KCDD thus far strongly suggests this. The DEIS should include an estimated build-out schedule and proposed phasing plan, including but not limited to the impacts and plan for minimizing the disruption to the existing businesses and residents of the district.

3. It is unclear why TOD Alternative A was even discussed since it has already been superseded by legislation passed in 2014 amending chapter 206E, making this an unrealistic alternative to the proposed action. The portion of the funding used for the analysis of Alternative A could have been better used to address 1 and 2 above and to consider other more creative and forward-looking alternatives, such as the use of Transfer of Development Rights (TDR), rather than additional density bonuses and building heights to achieve the desired development pattern near transit stations. There is great opportunity for TDR in Kaka'ako because the prime redevelopment sites are owned by just two major landowners. Why was this alternative not discussed? Were other alternatives than the above proposed actions considered? If so what were they and why (what criteria were used) were they discarded?

4. The Statement does not adequately address how the proposed action will conserve the natural resources so that land, water, visual, air and other natural resources are being

protected, preserved and the KCDD's unique natural environmental characteristics are being safeguarded, particularly its shoreline and marine resources pursuant to sections 226-11 and 344-3, HRS. The Statement provides information on the significant degradation that would occur but provides no specific details on natural resources, particularly those unique to the district, and a plan on how this will be addressed or mitigated in accordance with chapter 343.

5. While the Statement dutifully goes through the various federal, state, and county plans checking, off that the proposed action is consistent with or not applicable to these plans, more is needed. More careful study of the intent, objectives, and guidance by these plans, e.g. the Hawaii State Plan and its functional plans, the Hawaii Environmental Policy, the Coastal Zone Management Plan, State Ocean Resources Management Plan, etc. is needed. The agency needs to amend its Overlay Plan to conform with with the intent and objectives of the aforementioned plans. Some of these issues are cited in the following specific comments.

Specific Comments and Questions

The following provides comments and questions on specific actions in the Statement that must be addressed before an assessment can be made whether the significant impacts on the environment can be reduced or adequately mitigated:

1. 0.2(p 4) Summary of the Proposed Action and Alternatives.
   The Proposed Action is intended to be an incentive-based program providing incentives to landowners: in exchange for density bonuses, landowners would be required to provide exemplary public benefits. Please provide details of the incentive program; and, more specifically, provide a schedule of the type and amount of "bonuses" and correlating these with the "exemplary public benefits" that must be provided for each type of bonus. Current HCDA practices require minimal public benefit from a developer that builds denser, higher and closer concrete structures adversely impacting residents and businesses therefore please provide a more specific definition of "public benefits" and "exemplary" public benefits.

   The Statement also tells us that TOD is intended to optimize KCDD's development by promoting the use of smart growth principles, multi-model transportation, and walkability. What exactly are the principles of "smart growth" that will be applied to KCDD? This is a concept with many definitions and variables. Chicago's historic master plan, for example, ensured "every citizen to be situated within walking distance of a park." If HCDA is using this criterion for its TOD, we should expect more public parks and green spaces in the district. Instead, HCDA is approving developments that build more concrete structures rather than green and quality sustainable public spaces to enable residents living in denser and closer high rise buildings to enjoy their surrounding open environment. The Statement should provide more specific details of the general concepts that sound great but without more, tare merely dreams for Kaka'ako rather a plan for action. KCDD deserves a more comprehensive implementation plan that maps out how the mauka and makai plans will be executed to build an integrated, sustainable community – this is smart growth. Currently, developers are building for their own benefit rather than aligning with an integrated community district inclusive of mauka and makai lands. This is not the concept of "smart growth" development.

Using the term without more is deceptive. More study and information is needed to first identify how the proposed action will affect the KCDD and to determine the impacts and benefits that will result.

2. 0.3(p 6) Use of Public Funds or Lands for the Proposed Action
The proposed action intends to use public funds to implement a complete streets program, requiring funding by the City. Please provide the complete streets plan for KCDD, including the actions needed, budget required, and lead agencies with whom HCDA is working to plan and implement the program. What will be the disruption caused by the requirements? What is the timeline for execution and will it be done in phases? If so, specify the timetable and actions per each phase; and how the community will be involved and informed about the plan and schedule of development.

3. 0.3(p 10) Social Impacts
   - Improved public health. Please provide documentation for statements made that Kaka'ako will benefit from improved public health, reduction of traffic injuries or fatalities, reduction of air pollution, etc. when the current conditions are not healthy and will be less so with the anticipated construction and density of building and with no evidence to date that the agency is executing a plan to improve the necessary infrastructure –roads walkways, sewers, etc.
   - Improved access to housing. Please specify the basis for HCDA's statement that the proposed action will encourage more housing in an accessible location proximate to existing job centers when earlier in this Statement, it was reported that jobs would be reduced and housing will still be unaffordable to 80% of the resident population at 140% of AMI (unless this changed in accordance with the 2014 Report of the Reserved Housing Investigative Committee).
   - Improved parking options. While the proposed action is expected to offer a menu of different types of on-street parking treatments and policies to encourage long-term parking management strategies at the district scale to provide more efficient utilization, there is no district-wide parking plan. Has HCDA developed and adopted a parking plan for the district, including public and private parking, and how they will be managed for the district? If so, please provide a copy of the policies and parking management for efficient parking control for the district.

4. 0.4(p 7). Summary of Beneficial and Adverse Impacts - Employment.
Chapter 206E, HRS, the governing statute for the development of KCDD, envisioned a mixed-use, mixed-density, mixed-income community. In addition to affordable and mixed income residential, it was to attract and support a diverse range of businesses -- light industrial, commercial, and retail. TOD, smart growth, and the Mauka Area Plan are also based on principles of creating a community of mixed uses, balancing residential with business , recreation and other amenities.

However, the HCDA's Alternative B is changing the character and undermining the vision for KCDD by making it a bedroom community, increasing the residential population (73%) and reducing to only 27% the non-residential sf of development, with the result of eliminating 7,555 jobs/workers. What is HCDA's justification for not following the law and plans? What conditions have changed for HCDA to act contrary to law? Please provide justification for this

changed direction, and, whether HCDA is submitting legislation to reflect this change. If legislation is not submitted, please provide details on how HCDA has and will work with developers and community to address this conflict with the governing law, principles and existing plans.

5. 2.3.1(p 7) Neighborhood Character.
What is the distinct character of Kaka'ako that the proposed action will exhibit? The character is now lost to high-rise residential buildings with no aesthetic quality or design aligned with the character of the neighborhoods. While the seven neighborhood zones and the Aloha Tower Special District have been identified by types of buildings and services offered in these zones, nothing reflects the character or quality or history of the zone. HCDA has apparently made no effort to engage the community members in discussions of the history, sense of place and vision for the various Kaka'ako neighborhood zones. Document what HCDA has done to identify the neighborhood character. In other TOD sites, the City has engaged the residents and businesses in the area to identify the "sense of place" for the neighborhood so that the station can reflect that character. Has HCDA done or does it have plans to do this? Provide specific documentation, including dates and community residents involved in these efforts, if any, and the result of these discussions, specifically what input was used in creating the neighborhood "character"? Chapter 8 lists agencies and community meetings but these appear to have been informational and means by which the agency could gather input on its TOD Plan not the identification of the "character" of the neighborhood zone.

6. 2.3.2.6 (pp 18-20) Residential
The "affordable" housing policy discussed in the Statement is dated and brings into question whether the document is forward-looking to Kaka'ako's future in 2035 --a future that, by law, requires housing for a diverse population at varied income levels. The 2011 Hawai'i Housing Planning Study ("Study"), the major source document on our state's housing needs, found that between 2012 and 2016, Hawai'i will need at least 28,000 units to meet the total housing demand. The Study looked at the demand at each household income level, and determined that only 1,944 units --6.9%-- are needed by households making between 120% and 140% of area median income (AMI). Yet HCDA's rules currently allow for *all* for-sale "reserved"-- HCDA's term for "affordable"-- housing units to be priced above 120% of AMI. The same goes for *all* "workforce" housing. This policy exists even though the market can easily meet the need for such high-end units (a family of four at 140% of AMI can afford an apartment costing $758,000--the median apartment costs only $348,000). It's at the lower price points where HCDA must require developers to build "reserved" and "workforce" housing -- a need recognized by HCDA's own Reserved Housing Investigation Committee ("Committee"); in its report the Committee recommends that the top threshold of 140% AMI be lowered to 120% of AMI to build housing for those at the moderate income level.

The Committee further recommended that units sold to qualified buyers remain in the affordable pool for at least 30 years. Yet the DEIS fails to reflect this recommended change. It should also be noted that the City's unilateral agreements imposed upon developers require that 20% of units be priced for sale to households earning 120% of AMI or below, and the City has recommended this percentage be increased to 30%. It seems unacceptable for a "forward-looking" document not to reflect both State and City recognition that it is in the public interest to require lower household income qualifying levels and longer terms for retaining units in the "reserved" (affordable) housing pool.

Based on the above, what is the agency doing to pursue the recommendations of the Committee? Provide documentation of efforts to implement the recommendations, including the revision to this Statement.

7. 2.3.2.7(p 20) Parks and Open Space
While the Statement identifies new recreational open spaces such as plazas, the specific identification of public open green spaces and parks is missing. The only allocation of parkland identified is in a "redeveloped Blaisdell Center Park" and a "redeveloped HECO site" in the Thomas Square Neighborhood -- not in the KCDD where the density and closeness of residential buildings will be increasing, i.e. on the makai side of Kapiolani Blvd.

The national standard followed by the City is two acres of park for every 1,000 residents. If HCDA followed that standard in its planning for the district, it would set aside at least 84 acres for public parks. To date, there are only 53.59 acres in parkland. Instead, of more open green spaces for the 42,000 (or 46,000) residents, there is less, with more concrete plazas rather than quality open green public spaces and parks. Based on the law (chapter 206E,HRS) and the plans (mauka and makai), the agency should create a comprehensive park plan that addresses the needs of current and future residents, workers, and visitors in the district. If one does not now exist, it should, and it should include the open green spaces set aside as parks, the cost to build and maintain, sources of funding –private and public-- and the timetable to ensure that these lands are available at the build-out.

8. 2.3.5 (p 24) Building Height
TOD Alternative B introduces significant height increases, and indicates that tall residential towers could include a cluster of 420-550 feet residential towers and three residential towers to 700 feet – one in the Pauahi and Auahi neighborhoods and one as part of the potential redevelopment of Blaisdell Center. Is this possible? The current law (Act 61) prohibits any building above 418 feet. How will the TOD Overlay Plan address this restriction? Will the Statement be revised and what will the effect be on this DEIS and the attendant analyses of the impact of the proposed action?

The mauka plan's "Future Baseline" EIS contemplated 5.0 FAR, including parking; but Alternative B increases the density in TOD sites to a maximum of 10 FAR. What mitigating actions will be taken to provide for air, water, sewer, open space and mobility requirements so that the district will not lose its character or create urban vertical blight through the proposed action?

9. 2.3.6(p 26) Transportation.
Multi-modal transportation requires planning and infrastructure. What is the transportation "system" planned for KCDD? Nothing seems to be planned; only pilot demonstrations. A plan is more than a drawing of streets; it requires coordination with various federal, state and city agencies to design feasible and safe roads, bike paths, pedestrian walkways around and within the district. Has HCDA worked with the various private and public entities to develop a comprehensive transportation plan—one that is coordinated with and specifies responsible entities within government jurisdictions and private landowners to develop the roads, on and off street parking to accommodate the anticipated users, bikeways, and walking paths

throughout the district? Does HCDA have an implementation plan and timeline and budget identifying funding sources to execute its transportation plan if it has one.

Currently the significant impact of already over-taxed streets and roads will be further congested and eroded as Alternative B anticipated 42,000 additional residents will be moving into the area (and Alternative A with 46,000 residents). There does not appear to be any plan -- short- or long-range-- for the entire district. HCDA indicates that this is not its direct responsibility and "may require inter-agency coordination or partnerships to ensure implementation." What has HCDA done to date to explore which agencies are involved and what partnerships and costs might be required? What is the plan of action, including agreements with appropriate agencies and partnerships, and the costs for its execution? Has HCDA identified who will pay the costs? What are the effects of the proposed action on the economic and social welfare of the community and state, and what actions will be taken to minimize adverse effects? If HCDA does not yet have a plan, what has it done to date and what does it need to do to provide this essential information to assess the environmental impacts of the proposed action?

10. 2.3.7 (pp 36-39) Infrastructure.
This is a major concern of community residents and businesses. It affects their health, safety, and quality of life. A comprehensive plan for the entire district, not piecemeal building by building, project by project, studies, is needed to build KCDD properly. HCDA should indicate what studies have been completed, the cost and, if affecting various landowners/developers, what amounts have been assessed to those directly involved in increasing the load on the following infrastructure requirements for healthy, safe living:

- 2.3.7.1(p 36). Drainage. The existing drainage system is inadequate to accommodate and dispose of storm rainfall quantities in both the existing and future conditions. This is a significant impact on the environment not to mention the health and safety of residents. However, without further data or analysis, the Statement concludes that the build-out of vertical buildings will have negligible impact on the current already significantly impacted condition. Please provide additional research on this matter as it is important to the health of those who live, work and visit the district. Further, it would be irresponsible to dismiss the need for a plan to design and construct improvements that have been identified as needed to deal with the existing deficiencies. It is inexcusable that this current deficiency is not addressed; and, further, that it is unacceptable that additional buildings –even vertical ones with less runoff – are added without first addressing the existing problems of the district's poor drainage system. HCDA should develop and budget for corrective actions to address the drainage system deficiencies which adversely affect the health and quality of life of current and future residents. Please provide documentation on the deficiencies and the impacts of the deficiencies on the environment and people, estimated cost to construct the improvements needed, and funding source and timetable to address these deficiencies alongside the timetable for the proposed build-out.

- 2.3.7.2(p 37) Potable Water. Alternative A at full build-out will increase demand by approximately 1.11 million gallons per day over the Future Baseline Condition while Alternative B would increase demand by approximately 800,000 gallons per day. In either case, upgrades are needed in addition to the upgrades that have already been made. Specifically, the study reports that the current water mains must be upgraded to replace

37,600 linear feet of existing 6-8 inch mains with 12-inch mains to meet peak hour consumption and fire flow requirements. What is the timeline for the upgrade, the cost, and source of funding?

- 2.3.7.3 (p 37) Wastewater Collection and Treatment. Under Alternative A full build-out would increase daily wastewater flow rates by 1.2 million gallons over the Future Baseline Condition while Alternative B would increase it by 300,000 fewer gallons per day. While several CIP projects have been budgeted by the City to improve trunk lines, rehabilitate sewer lines and to add a new pump station in the area, the current problems with sewer smells lead residents to believe that these were budgeted but not funded. Please provide the documentation showing the enhancements above, including the work order, date completed, and cost.

  Please also provide the City's study results for the Relief Sewer Corridors and timeline for and source of funding, whether budgeted and approved, for the replacements of sewer lines. The DEIS states that even with the improvements a number of sewer mains will remain surcharged. Please provide a description of which sewer lines will be surcharged and documentation and source of assessment that the system would meet peak flow requirements and will not engender spills.

- 2.3.7.4(p 37) Solid Waste Disposal. Even with 42,000 (or 46,000) more residents there is no modification to the solid waste disposal program planned within the mauka area. Please provide documentation of the study to justify this conclusion. And specify why private contractor collection services will be used instead to meet increased demands. We have seen a private contractor used for the existing system but the problem is an expedient and not long-term fix so please explain why HCDA prefers this "band-aid" approach rather than upgrading the "system"

- 2.3.7.5(p 37), 4.11.5(p 254). Electricity. How is HCDA proposing to address the threefold increase in electricity demand of Alternative B? The Statement merely indicates what HECO may do, i.e., "may serve the additional loads from its Iwilei and Kewalo Substations...or..." and beyond nine years, "...will likely need to secure an additional substation site." Has HCDA met with HECO to find more sustainable, energy efficient options? Surmising what the utility may or may not do is not good planning nor does it provide the necessary data and options to determine how to provide an operational necessity for residents and businesses in KCDD. Please provide information on how the estimated demand was calculated, and what efforts, if any, have been made to meet with HECO to create a long-range plan for electrical service for KCDD. If not, HCDA should meet with HECO and develop agreements and a plan for stable and reliable power for the additional 42,000 (or 46,000) residents plus the additional businesses, workers and visitors to KCDD anticipated through 2035 to ensure that the build-out will not fall short and diminish the quality of life and activity due to the lack of firm, adequate power.

  Words are empty without a plan to comprehensively address the infrastructure required for the health and safety of those who live, work and play in the district. The impacts are tremendous on the infrastructure and environment – currently we have poor streets and roads, poor storm water drainage during heavy rains, sewer smells emanating from

roadways and particularly pungent after the rains, no public schools, no grocery stores, and not enough parks.

HCDA cannot manage the KCDD without first mapping out the essential elements of a community and coordinating with government, landowners and developers, and the residents and small businesses already living and working in the district to ensure the infrastructure can carry the current and added load of 42,000 (or 46,000) additional residents plus the thousands more workers and visitors to the district. Please provide the specific plan for infrastructure enhancements or replacements to ensure there is sufficient carrying capacity of the roads, sewers, waste water treatment, storm drains, potable water, parks, and schools, and include an estimated timeline for various improvements, budget, and sources of public and private funding (and whether there have been commitments or encumbrances for these items). Although probable costs are reported (eg. Appendix K, reports the total cost for sewer mitigation for TOD Alternative A is $4.5 million), there is no information on the source of funding, and timetable for completion of these mitigation measures and, in particular, as they relate to the proposed action in those identified areas in the district. What are the other impacts and mitigation measures required during construction of these and other infrastructure projects?

11. 2.4 (p 39) Implementation.
    When significant impacts are anticipated, as in this massive proposed action disrupting current businesses and residents in the district, it is distressing, given the agency's actions in approving permits and long-term leases with little regard for the surrounding community, that there is no specific implementation plan or even a strategy as to how the build-out will occur. The Statement merely provides in one paragraph that the proposed action "will be adjusted to accommodate public input as appropriate." This is insufficient disclosure of the environmental effects of the proposed action, all which come with implementation. This must be provided to determine the impacts and needed mitigating measures needed to ensure that the quality of the environment is not irreparably degraded.

12. 4.7 (p 65) Traffic
    The DEIS recognizes that the increase of residents, visitors and workers will exacerbate traffic conditions with slower travel times and that the major intersections will run at LOS F. Traffic and travel delays already challenge current residents, workers and visitors to the district. What plan for a better circulation of multi-modal transportation is proposed? Please provide your multi-modal plan, budget and timeline for execution.

13. 4.8 Noise
    4.8.2(p 127) identifies the KCDD traffic noise levels along Nimitz Hwy, Ala Moana Blvd, Kapiolani Blvd, King Street, Ward Avenue, Piikoi, Punchbowl, Pensacola, South and Cooke Streets where the noise was typically greater than 65 DNL along the rights of way due to the large volumes of traffic on those major thoroughfares. Additionally, Figure 4-24 depicts crosshatched areas where traffic noise levels generally exceed 65 DNL and are considered to be "Significant Exposure--Normally UNacceptable" (SE-NU)."

    The Department of Housing and Urban Development (HUD) requirements establish three zones: acceptable (project can be approved); normally acceptable (project would have to be evaluated individually); and unacceptable (project would not, as a rule, be approved). HUD's

standard for interior auditory environment at residences shall not exceed a day-night sound level of 45 DNL. And, further, the maximum permissible sound level under the Department of Health (DOH) standards for residential areas and public spaces is 55 dBA/DNL during the day and 45 dBA/DNL at night (Section 11-46-4, HAR).

Clearly the current noise levels are unacceptable under any of the standards. The proposed action will double the traffic and street loading by 2035 and increase the residential density by over 50%. Despite being aware that existing noise levels are harmful to health and in violation of federal and state standards and guidelines as well as mandatory requirements, the Statement does not address specifically how the existing unacceptable and illegal noise levels will be mitigated.

More specifically, the Statement should address the following:

- What is the TOD noise standard for interior and exterior buildings for the district? Is it using DOH or federal standards? Please specify and provide a chart of the noise standards alongside the actual noise level for the various streets in the district.
- The KCDD noise level is currently unacceptable under federal (EPA, HUD) and state (DOH) guidelines and at levels harmful to public health. How will this be mitigated for each of the areas listed above? Please provide a plan, including mitigation measures, timetable, cost, source of funding and who is responsible for executing the plan.
- What is the noise level of all other areas in the district (those delineated in Figure 4-24 as well as all other areas), and, if unacceptable or normally acceptable (day-night noise levels of 45 DNL for interior and exterior buildings), how specifically will the noise levels be mitigated? Provide specific measures, timetable, cost, and responsible agents to execute the mitigation.
- How will the hundreds of units which have single pane windows in these areas be retrofitted as recommended under section 4.8.3? And who will pay for retrofitting the units?
- Have federal (EPA) and state (DOH) agencies been notified that the noise levels are not within federal or state standards in many parts of the district? And, if so, what was the response and did they provide recommendations for mitigating these violations? Please provide a copy of the notification; and, if this was not done, justification for not providing notice.
- Has the public been informed that the existing noise levels exceed federal and state statutory noise standards? If not, when will it be done and by what means?

14. 4.8.3.1(pp 131-33) Traffic and Rail Noise

Although the Statement states "Under full development of worst-case scenario under the proposed action in 2035 essentially no significant increase in traffic noise levels are expected except for sections of Kamakee Street between Ala Moana Boulevard and Auahi Street" and "The results of the analysis indicate very small changes in 2035 traffic noise levels associated with the worst-case scenario under the proposed action." Yet the Statement also provided data showing that there are significant impacts due to the current and future unacceptable noise levels (above 55 DNL/dBA during the day and 45 DNL/dBA at night) even with the buffer zone of 192 feet on either side of the rail and use of closure and air conditioning in residential units:

- At 700 Richards Street rail noise levels of 65-62 DNL
- At 610 Cooke Street rail noise level 56-62 DNL
- At other Waldron Neighborhood Park predicted noise levels of 47 DNL
- At 860 Haekauwila Street predicted noise levels are 57-61 DNL
- At Uraku Tower predicted noise levels are between 60-61 DNL

The Statement provides a troubling assessment of mitigation measures and their ineffectiveness at pages 132-33: The noise mitigation measures for residential units in areas with exterior noise levels that exceed 65 DNL will typically involve the use of closure and air conditioning but the "use of sound attenuating walls or barriers will be of limited effectiveness" for mid- and high- rise buildings adjacent to roadways of the rail corridor; and, further "as the density of these mid- and high-rise structures increase along the transportation corridor, their reflective surfaces will tend to increase the background noise."

Based on the above assessments of the unacceptable noise levels and the ineffectiveness of mitigation measures currently assessed, please provide the following:

- Explain why and how specifically the conclusion was made that the doubling of the occupancy and transportation and traffic in 2035 will not increase the noise levels when the noise levels along the major streets are already at unacceptable levels.
- Explain the Statement's conclusion that only very small changes to the noise level is expected in 2035 with the addition of the rail and its impact as described above when the noise levels are currently exceeding the DOH and EPA standards for residential and public spaces.
- Have the EPA, HUD and DOH been notified that the planned development will not meet required safe noise guidelines nor has it found adequate mitigation measures for the mid- and high-rise residential units to be built along the transportation corridor? Please provide a copy of the notification and response. If these agencies have not been notified, please provide a justification for non-notification; and a commitment to notify and work with these agencies to find more viable mitigation measures than offered in the Statement.
- Noise levels at parks should not exceed 45 DNL/dBA, yet this is already exceeded in those parks adjacent to Ala Moana Boulevard. Who is responsible for mitigating the current noise levels to ensure compliance with federal and state laws? Has the DOH been notified of the excessive noise levels? If so, please provide a copy of the correspondence; if not, provide reasons for not informing DOH. And, will the agency notify these regulatory agencies and the public? If not, why not?
- What are the specific mitigation plans to address unacceptable noise levels (in violation of federal and state standards) at the KCDD parks, and affected hospitals, recreation areas, and other spaces frequented by the public and residents?
- According to the Statement, all units within 190 feet on either side of the rail will require closure and air conditioning to be habitable. Who will be responsible to notify and compensate those affected? Have residents and businesses in the affected areas been notified? Please provide correspondence of the notification.
- Who is responsible for addressing and mitigating noise levels in the district? For the TOD areas along the rail line? As the entity responsible for KCDD, HCDA should work with HART/TOD administration to develop a noise and mitigation plan for areas along the line. Has HCDA done this? And if so, please provide report of the status of these

meeting(s). And if closure and air conditioning are required, including any retrofitting, what is the plan, including a budget, to meet the needs of its community. Please provide the plan or any evidence that this major health hazard is being addresed, including the anticipated mitigation measures required and an estimated budget.

- The Statement does not address how the density of and glass on mid- and high-rise units will affect the noise levels other than stating that the noise levels will increase. How specifically will the noise level in the district be assessed, charted, and addressed and by whom?
- Many older units which are also high rises have single pane windows. What entity will be responsible for retrofitting these units if noise levels exceed federal and state guidelines at any stage of the build-out? What is the plan for addressing this problem and how it will be executed, including who is responsible for paying the mitigation costs.
- When will DOH (or contractor) assess the noise levels of existing high rises and buildings? The base line measurements are required on all affected areas especially those already identified as adjacent to current excessive noise areas. Please provide any correspondence with DOH and/or contractors

15. 4.10.7(p 183). Education Facilities.
There are no public schools in KCDD. The current elementary schools outside the district are near capacity and therefore there is definite need to plan for the future influx of working families who will no doubt have children needing a school in the district. What is the result of the DOE exploratory study of using its Pohukaina site as a school once again? If not there, where in Kaka'ako would a school be located? This is a major deficiency that has significant social impact on residents now and in the future. Please provide a report on the options for schooling our children in Kaka'ako and a plan, including costs, to implement the various scenarios and options other than the general cost estimates provided at page 188. What has HCDA done to address DOE's understanding that space would be made available for a school facility within the development project using the Pohukaina site? What is HCDA doing to facilitate the implementation of the DOE exception to meet the currently much-needed elementary school?

16. 4.10.8.1(p 190). Public Emergencies and Public Safety.
At build-out for Alternative B the district will require an additional 32 staff plus two additional fire trucks while Alternative A will require twice the number of staff, which will cost between $3.6 to $6.2 million, depending on the alternative, and anticipated construction costs for an expanded station ($8 -10 million).

Similar requirements are provided by the current non-existent police force in the district, with almost $3 million needed for staffing under Alternative B and over $4 million for Alternative A. Add to the personnel costs, the facilities annual rental cost of approximately $30,000.

Both these services are essential for the district currently and in the future and requires planning for the location of these services and the coordination with the police and fire

departments. Please report and provide any agreements on providing the staffing, budget, and facilities for these services.

17. 4.10.9 (pp 192-97) Recreational Facilities.
Open green space is critical to the health and quality of life for the 42,000 (or 46,0000) residents at full build-out. If lands are not set aside now, these natural resources will be irrevocably committed to the substantial detriment of the economic, social, health and environmental quality of the community for the long-term. KCDD residents should not be deprived of the same quality of open green space as the city standard of 110 sf of green space per unit instead of the contemplated 55 sf of recreational space (which is not green and open). The proposed outdoor recreation spaces by Howard Hughes Corp and Kamehameha School are plazas. Are these to be green open spaces? Please provide more specific descriptions of the efforts to meet chapter 206E requirement for parks and green open spaces.

If HCDA cannot estimate the cost of parks maintenance and appears not to be able to manage the parks, has it contemplated transferring responsibility of parks management to the City and/or Department of Land & Natural Resources? Has HCDA met with these agencies to explore possibilities? If not, why not? Please address this major requirement for green open public spaces, particularly in denser, closer and more vertical concrete living, as required not only by Chapter 206E, HRS, but also by Section 344-3, HRS(2) requiring that the programs, authorities and resources enhance our quality of life.

18. 4.11.7(p 255) Telecommunication Utilities.
With the additional residents and businesses and with the view toward 2035, what plans are being explored with Hawaiian Telecom to upgrade and plan for the future when everyone will require high speed internet service –and at lightning speed? School children are already starting to use computers and smart phones at younger and younger ages and will demand more advanced technological tools. Nothing about this 2035 future so important to our economy is discussed or planned for in the Statement. The Statement should explore these options to truly pursue the community of the future in a systems approach—connecting environment, home, business, education, culture, and recreation in an energy-efficient and technologically advanced system.

19. 4.12 (p 257) Aesthetic Environment
The Mauka Area plan viewplane should be maintained as one of the major assets of urban Honolulu –views of the mountain to the ocean and of its iconic Diamond Head (not a concrete building the height of Diamond Head). The proposed actions contemplating the dismissal of these concerns based on a "NIMBY" attitude by the HCDA is misplaced. This is the heart and soul of Hawaii and the reason many visit and live in this paradise state. This is the legacy that our wise policymakers put into law in chapters 226 (Hawaii State Plan), 344 (State Environmental Policy) and chapter 206E (Hawaii Community Development Authority). Let not the expediency of money degrade the environment which, once leveled and concretized, will be irreplaceable.

The Statement should report specifically on plans to maintain and enhance the aesthetic natural beauty of the district, the costs, and the plan for its public and private funding. The development of guidelines as proposed at 4.12.6.3 is inadequate. More is needed. Aethetics is

also subjective and should involve those who must spend their days in the environment. What efforts were made by the agency to involve those who live in the district to provide input on the guidelines and viewplanes in careful and meaningful ongoing discussions? Does the agency have an advisory group; not the consultants calling focus groups together? If so, please provide a report of the meetings, dates, participants, and input that was used to determine the aesthetics/tower siting and design and other aesthetic components of the proposed action alternatives.

20. 8.2 (pp 1-9) Community Outreach

- What was the purpose of the open house meetings held on four days in May 2013? Was it to merely inform the attendees about the TOD plan? What was the objective(s) of those meetings? One of the major TOD principles is community involvement in developing the plan, particularly in identifying the character of the neighborhood. If one of the objectives was to obtain community input, were the comments incorporated into the TOD Plan? In reviewing the comments on pages 4-9, and reviewing the TOD Plan, it appears that very little of the input seems to have gotten into the plan or Statement. Why not?

- It appears that a consultant created the plan with staff and presented this at the community meetings with very little effort to incorporate concerns or ideas from those who took the time to attend the meetings. Please provide a chart itemizing the comments from community members (not the developer or its staff) listed on pages 4-9 and next to each comment describe where it is included in or reasons for not including in the TOD Overlay Plan and the Statement.

- Other TOD sites in the City have ongoing advisory councils to provide input on the TOD Plan. Why was this element missing in creating the KCDD TOD Plan? Is the agency going to correct this oversight? If so, please describe the the process by which it will create such an advisory council, how it will select the members, and how it will operate to provide ongoing input and feedback in creating TOD areas that reflect the character of the neighborhood.

- Also missing from the invitation list are major agencies that are responsible for the health and safety of the public, e.g., the State Department of Health and US Environmental Protection Agency. Why were these excluded? What are the agency's criteria for identifying agencies from which it requests input and comment? And how did HCDA identify the community members invited to comment?

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

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Ref. No.: PL TOD 18.3

June 10, 2015

Kaka`ako United
P. O. Box 235965
Honolulu, Hawaii 96823

Ladies and Gentlemen:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 22, 2015 commenting on the above document. Following are responses to your comments in the order they were presented in your letter.

Length of Comment Period:

The 45-day comment period is established by law. We regret that you feel there is insufficient time to provide comments.

Effects of the Proposed Action:

We believe that the EIS is sufficient to address the requirements of Chapter 343 and Section 11-200, HAR.

Unanswered Questions:

The conclusion of the Draft EIS comment period does not necessarily mean that the conversation about the Proposed Action has ended. As you are aware, the HCDA must still consider the adoption of rules to implement the TOD Overlay Plan. Public comments will be accepted as part of that process.

General Comments:

1. As discussed in the EIS, the TOD Overlay Plan is presented as an incentive-based program. Individual landowners are free to take advantage of the program or develop their property as

allowed by the existing Mauka Area Rules. The extent of construction impacts will be defined by the timing of specific development projects. While the EIS presents a 2035 planning horizon, actual development pursuant to the Proposed Action could conceivably extend a decade or more beyond that date. Rather than represent continuous construction activity district-wide, this means that individual construction projects will likely occur more irregularly during a longer period of time. For this reason, we do not agree with your characterization of "continuous construction".

Yes, it is true that some businesses may be displaced for a variety of reasons during the next 20 or more years. To more clearly address this possibility, the following discussion has been added to Section 4.10.13.3 in Chapter Four:

> *While the potential redevelopment of some existing residential and commercial properties is possible, resulting in the displacement of some occupants and/or businesses, the addition of new housing opportunities and new commercial activities in the KCDD, both under the Proposed Action and the Future Baseline Condition, will provide new housing and commercial opportunities which could enable displaced residents and/or businesses to relocate elsewhere in the District, thereby mitigating to some degree the impact of displacement.*

With regard to property size, while smaller properties are to some extent excluded from the TOD Overlay Plan, they still retain the ability to redevelop pursuant to existing Mauka Area Rules. The Mauka Area Rules already provide density bonuses and exemptions from off-street parking requirement for all of the Central Kakaako neighborhood with the intent of maintaining the industrial use within Central Kakaako. As addressed above in the new language in Section 4.10.13.3, expanded opportunities pursuant to TOD will help to preserve small business opportunities in Kakaako by providing them an

opportunity to potentially relocate within the District if they so choose. A rising tide lifts all boats.

2. Please see our response under General Comments above. Individual construction projects are, indeed, short-term. How and when individual property owners will respond to new opportunities will be determined by a variety of reasons, many of which are beyond the scope or control of HCDA. We believe that the characterization of future development activity as presented in Section 6.6 of Chapter Six, pertaining to Unresolved Issues, accurately describes the dilemmas associated with predicting the timing or phasing of development in the District.

3. As discussed in the EIS, it would have been imprudent not to include an analysis of TOD Alternative A. Transfer of development rights (TDR) in the form of density transfer within the Kakaako Community Development District (KCDD) is already provided for in the Mauka Area Rules. The EIS does not discuss TDR from outside of the KCDD because any additional density coming into the KCDD from outside cannot be accommodated without changes in the urban design that would impact the allowable height and bulk of buildings within the KCDD.

4. As an extensively developed existing urban area, Kakaako's natural resources are extremely limited. Planning for redevelopment in Kakaako began several decades ago and the necessary infrastructure to accommodate this development has already been constructed. The redevelopment of Kakaako, including its visual impacts, and effects on water consumption and air quality have been addressed in the current EIS as well as two previous statements. As discussed in the current document, redevelopment in Kakaako will help to preserve valued natural resources in rural areas on Oahu.

5. As a programmatic-level document, the discussion of compliance with existing plans and policies fulfills the intent of Chapter 343. We respectfully disagree with your characterization that more discussion is needed.

Specific Comments and Questions:

1. As discussed in Section 6.6 of Chapter Six (Unresolved Issues), the structure of the incentive based program has not yet been developed. This will occur during rule making. The EIS discusses the overall impacts of the Proposed Action. These impacts would not be significantly altered by the program. The term public benefits refers to development project attributes that would improve quality of life for both the tenants of the project and the general public. The term exemplary focuses on the objectives of the Proposed Action. Please refer to Chapter 4 of Appendix A for an extensive discussion of the subject.

   Again, please refer to Chapter 4, as well as Chapter 6, of Appendix A for further detail. HCDA is not using Chicago's criteria…it is developing its own.

2. Complete Streets can be accomplished through a public-private partnership with the private sector taking the lead. Individual development projects can help to implement the program presented in Chapter 6 of Appendix A. Complete Streets initiatives will be coordinated with the City's Department of Transportation Services. However, the program depends upon choices made by individual landowners. Thus, without knowing who may step forward, or when, no timeline can be offered at this time.

3. Please refer to the studies referenced on page 5-16, 5-25, and 5-38 of Appendix A.

   As discussed in Section 4.10.5.2, HCDA is revising its Reserved Housing program in an effort to increase the provision of affordable housing in the KCDD.

   The issue of an overall parking plan will be addressed during rule-making. Please refer to the discussion in Chapter 8 of the Appendix A.

4. Hawaii Revised Statutes §206E-31(4) provides for a mixed-use district whereby industrial, commercial, residential, and public uses may coexist compatibly within the same area. The TOD Overlay Plan as well as the Mauka Area Plan and Rules allow for industrial, commercial, residential, and public uses within the district. Therefore, HCDA disagrees with your characterization that it is acting contrary to the law. The primary development pattern in the last 30 years has been towards providing new residential opportunities with a healthy mix of commercial development. There is no change in direction. The term bedroom community is not applicable to Kakaako. As discussed in the EIS, the TOD Overlay Plan provides for a mixed-use district where industrial, commercial, residential, and public uses can co-exist compatibly within the same area.

5. The existing character of the neighborhoods is discussed at length in Section 2.3.1 of the EIS Chapter Two, and in Chapter 1 of Appendix A. The history of the area is presented in Appendix C, the Supplemental Cultural Impact Assessment for the Proposed Action. HCDA has conducted several community meetings in May, 2013 to get community input on the Draft TOD Overlay Plan. Meeting attendees are listed on page 3 of Chapter Eight of the EIS. Attendees were invited to comment on all aspects of the Proposed Action and their written comments were collected by HCDA. In addition, the HCDA has made the draft TOD Overlay Plan available at its website for public review since May 2013.

6. HCDA shares your concern. HCDA's Reserved Housing policy has been revised as discussed in Section 4.10.5.2 of Chapter Four in the EIS. Specific provisions regarding the implementation of the Reserved Housing policy as it pertains to TOD will be addressed during rule-making.

7. Please refer to the discussion in Section 6.6 of the EIS Chapter Six for a HCDA's statement regarding of its park planning efforts.

8. Your conclusion in is error. Alternative A includes building heights in excess of 400 feet. Alternative B is limited to building heights of 418 feet. Your statement regarding FAR for Alternative B is also erroneous. Please see discussion on page 23 of the DEIS Chapter Two. The discussion of mitigations to address building density and height are presented throughout Chapter Four of the EIS.

9. The TOD Overlay Plan is the plan intended to address multi-modal transportation in the KCDD. It has been and will continue to be coordinated with HART and the City's DTS. A specific budget for transportation improvements has not yet been determined. The EIS evaluates the Draft TOD Plan. Once the EIS is finalized, the Draft TOD Plan can be finalized. This effort will be followed by rule-making. At that time, the necessary elements will be in place to begin budgeting. With regard to funding, please see Response #2 above.

10. The EIS presents updates to the existing Water and Sewer Master Plans for KCDD. Please refer to Appendices J and K.

    With regard to Drainage, please refer to Section 4.11.4.2 of Chapter Four in the EIS. The status of the existing system is fully disclosed. The analysis was conducted by HCDA's engineering consultant and no further studies are required to determine what the impacts of the Proposed Action will be.

HCDA recognizes its obligation to address existing deficiencies.

No timetable or budget has been developed at this point in time for the requisite upgrades to the water system identified in the EIS.

With regard to the City's sewer improvements, HCDA is not able to provide the information you request. Please address your request to the City's Department of Environmental Services. To our knowledge, the City has not yet completed its Relief Sewer Corridor study. We understand that it published an EIS preparation notice for the study two years ago, but has not yet published a Draft EIS. That document will be the best source of current information once it is published. The City's timetable and budget cannot be determined until it completes its study and publishes its own EIS. This is why issues pertaining to the relief sewer line are presented as an Unresolved Issue in Section 6.6 of Chapter Six in the EIS. In the meantime, please refer to Appendix K in the EIS.

The current system for solid waste disposal is adequate as determined by HCDA. As the TOD Overlay Plan is incentive based, it will be up to individual landowners to participate. They will make their own arrangements for private collection on an as-needed basis.

Information regarding electrical demand was provided by Ron Ho & Associates and included in the analysis presented to HCDA by its engineering consultant, Belt Collins Hawaii LLC. The public utility is obligated to provide electricity to meet anticipated demand. The EIS presents HECO with information that it requires to conduct preliminary planning. HCDA will continue to provide HECO with information as specific development permit applications are presented to HCDA for review. HECO is working closely with the Public Utilities

Commission to address the issue of providing sustainable energy on Oahu.

As discussed in Chapter Four of the EIS, the Mauka Area Infrastructure Plan (MAIP) has been updated to address anticipated TOD demand (see Appendices J and K). The Transportation analysis presented in Appendix D fully addresses the status of roadways in the District. The information you request is all in the EIS. As discussed previously, timetables and sources of funding cannot be provided at this time, as the implementation of the TOD Overlay Plan will depend upon the timing of individual landowners. Please refer to Sections 4.11.1 and 4.11.2 in the EIS for a discussion of impacts and mitigation measures related to water and sewers respectively.

11. The statement on page 39 of Chapter Two is sufficient for the purposes of the programmatic-level EIS. Environmental effects are fully disclosed in Chapter Four of the EIS. To understand the full dynamic of the Proposed Action, the entire EIS document must be carefully read.

12. Chapters 5 through 8 of Appendix A together address the full breadth of the TOD Plan's multi-modal program. A budget and timeline for implementation is not yet available.

13. Specific noise mitigations for residential units exposed to noise levels in excess of 65 DNL are presented in the last paragraph of Section 4.3.8.1 of Chapter Four in the EIS.

    Please refer to Appendix E of the EIS for existing noise standards.

    Section 4.3.6 of the EIS's Chapter Four presents a discussion of noise impacts and recommended mitigations. Individual development projects adjacent to major roadways will be responsible for addressing noise mitigation. Specific

timetables and budgets cannot be determined at this time because specific building plans are not known.

The discussion in Section 4.8.3 pertains to new construction. Redevelopment adjacent to Ala Moana Boulevard has been occurring since the mid-1980s. It is up to individual property owners to address the issue of excessive traffic noise. The degree to which it is relevant depends upon such factors as the distance of a building in relation to the street and its orientation to the street. Retrofitting existing units is beyond the scope of the EIS.

The EIS is a disclosure document and has been presented to all required agencies, including the State Department of Health. The DOH's comments are presented at the end of Chapter Eight in the EIS.

The public has been notified pursuant to the publication of the Draft and Final EIS, as well as through previous EISs published by HCDA.

14. The two statements cited, one concerning traffic and the other concerning rail, are not inconsistent or conflicting: they address different subjects. Because the TOD EIS does not focus on the construction or operation of the rail system, HCDA must rely upon information presented by HART concerning noise impacts in the rail EIS. HCDA's noise consultant reviewed the HART EIS for the information pertaining to rail-related noise impacts.

    Appendix D, the Transportation Analysis for the TOD Overlay Plan, concludes that implementing a multi-modal strategy in Kakaako will help to mitigate impacts.

    The Noise Study's conclusions (see Appendix E) need no further analysis or explanation. Although noise conditions

exceed standards in some areas, they will not be significantly worsened.

The EIS has been distributed to all required agencies, including the State Department of Health. Neither HUD nor the EPA have been notified. In Hawaii, federal noise regulations are enforced by the State Department of Health.

With regard to existing noise at parks, please see the response above. As discussed in Appendix E, noise levels depend upon proximity to the noise source. For example, while portions of Ala Moana Regional Park immediately adjacent to Ala Moana Boulevard are periodically exposed to excessive levels of noise, interior areas are not.

There are no current plans to address existing noise levels at existing KCDD parks or other spaces frequented by the public.

The responsibility to address the noise impacts of rail for new buildings adjacent to the rail line rests with the property owner and will be addressed at the time of new building construction. The TOD Overlay Plan considers the siting of buildings in proximity to the rail line as an important consideration to reduce noise exposure. The EIS is a disclosure document and is a matter of public record.

As discussed in the EIS, HART is responsible for mitigating rail noise in areas where it is deemed excessive. For new development in Kakaako, individual property owners will be responsible for addressing noise impacts.

We are uncertain as to the meaning of your question pertaining to glass. Please refer to Appendix E for a discussion of how noise impacts were assessed.

As discussed above, the matter of retrofitting older (existing) units is beyond the scope of the EIS. Plans for retrofitting are

the responsibility of existing owners and will likely be addressed by them on a case-by-case basis. We are unable to determine if the cost of retrofitting will be borne by the property owner or passed on to tenants.

The assessment of noise levels for existing buildings is conducted by DOH on a case-by-case basis, as needed. Please contact DOH for further information.

15. HCDA continues to work closely with the DOE to address the long-term issue of schools that serve the KCDD. Discussions concerning Pohukaina are ongoing. HCDA is confident that requirements for a new elementary school will be addressed eventually.

16. There is nothing to report regarding police and fire personnel at this time. However, please note that HPD presently provides service to Kakaako. Your statement regarding police being non-existent is inaccurate. Future planning for new police and fire personnel is ongoing and will be addressed in coordination with new development in Kakaako.

17. Information on the City & County of Honolulu, Department of Parks & Recreation indicates that there is over 800 acres of parks and open spaces in urban Honolulu between Downtown and Waikiki. As discussed in Section 6.6 of EIS Chapter Six, HCDA is presently conducting an outreach program for Parks Master Planning. The need for new green open spaces will be addressed as part of that effort.

18. Responsibility for telecommunications services rests with Hawaiian Telcom. HCDA has not been advised of any specific plans for the utility to upgrade its service. The provision of faster internet speeds, while desirable, is beyond the scope of the EIS.

19. The TOD Overlay Plan complies with the City's requirement to preserve view corridors along mauka-makai oriented streets in the District. Prevailing height limits within the Mauka District have been established by the State Legislature pursuant to Act 61 in 2014. The redevelopment of Kakaako has been articulated as a goal of the State since the early 1980s. Construction of new buildings within the District, in compliance with the preservation of identified view corridors, is not prohibited. We acknowledge your conclusion that more is needed to protect views, but we respectfully disagree.

20. The purpose of the May 2013 meetings was to introduce the Draft TOD Overlay Plan to the public and to take comments. The Plan was introduced several months before the EIS began to be drafted, thereby allowing all interested parties to comment on it. The Plan remains in its draft form until the conclusion of the EIS. Comments on the Draft Plan, as well as those concerning the EIS, will be considered in the course of finalizing the Plan.

    As indicated above, the process of finalizing the TOD Overlay Plan has not yet been concluded. HCDA has no current plans to itemize the comments as you request.

    The HCDA has created its own process for community input on the Draft TOD Overlay Plan. No changes in its current process are anticipated.

    The Draft TOD Plan and the Draft EIS were provided to the DOH. Please see the end of Chapter 8 for DOH comments on the Draft EIS.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

16825

AIRLINES COMMITTEE OF HAWAII

Honolulu International Airport
300 Rodgers Blvd., #62
Honolulu, Hawaii 96819-1832
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HAWAII COMMUNITY
DEVELOPMENT
AUTHORITY

February 23, 2015

Mr. Anthony J.H. Ching
Executive Director
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Subject: Kakaako Community Development District
Transit Oriented Development Overlay Plan
Draft Environmental Impact Statement

Dear Mr. Ching:

The Airlines Committee of Hawaii (ACH), which is comprised of 20 signatory airlines that underwrite the State of Hawaii Airports System, appreciates the opportunity to comment on the Draft Environmental Impact Statement for the Kakaako Community Development District Transit Oriented Development (TOD) Overlay Plan.

Although the Kakaako TOD Overlay Plan is very conceptual at this time, due to the Kakaako Community Development District's (KCDD) proximity to Honolulu International Airport (HNL), the ACH has concerns relative to the potential impact to HNL's airspace and airline operations.

Specifically with Alternative "A" and the Auahi and Pauahi development blocks, portions of those blocks appear to be laterally within the protected envelope for the RNAV (RNP) 26L approach. Depending upon the specific location and height (especially if it is up to 700'), there could be the possibility of that approach needing to be modified, and ultimately the changes would reduce the safety margin and usability of the approach (potentially steeper descent angle and/or higher minimums).

If aircraft are using that approach, it means that we are in IMC Kona-wind conditions, and that RNAV (RNP) type approaches represent the future standard in terms of the FAA NextGen program, it is an important consideration.

Furthermore, the KCDD falls within the airspace of HNL, as well as within One-Engine Inoperative (OEI) obstacle accountability areas for many commercial aircraft. As a result, further development in the area may adversely impact airline operations by encroaching on OEI corridors, and could restrict flight payload and/or stage length as well as decrease safety margins.

Unfortunately, absent more specific details relative to building heights, locations and other airspace obstruction information, it is not possible to provide more concise comments. Therefore, the ACH firmly believes that a meeting to discuss the HCDA's plans well in advance of a filing of the FAA Form 7460-1 is imperative to ensure a successful outcome for the HCDA, HNL and airlines.

Please feel free to contact us at (808) 838-0011 if you have questions.

Sincerely,

Blaine Miyasato

Blaine Miyasato
Co-chairperson

Matt Shelby

Matt Shelby
Co-chairperson

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

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David Y. Ige
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John Whalen
Chairperson

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Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Blaine Miyasato
Mr. Matt Shelby
Co-Chairpersons
Airlines Committee of Hawaii
300 Rodgers Boulevard, Suite 62
Honolulu, Hawaii 96819-1832

Dear Messrs. Miyasato and Shelby:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 23, 2015 commenting on the above document. Following are responses to your comments in the order they were presented in your letter.

As discussed in the EIS, Alternative A cannot be implemented unless the State Legislature repeals Act 61 (2014) to allow building heights in Kakaako to exceed 418 feet. As also disclosed in the EIS, the specific timing of new building construction (and the extent to building height up to the current prevailing limit of 418 feet) will be determined by individual property owners. HCDA concurs that it would be appropriate to meet with representatives of your organization in advance of filing FAA Form 7460-1.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

16827

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KIRK CALDWELL
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GEORGE I. ATTA, FAICP
DIRECTOR

ARTHUR D. CHALLACOMBE
DEPUTY DIRECTOR

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HAWAII COMMUNITY DEVELOPMENT AUTHORITY

February 23, 2015

Mr. Anthony J. H. Ching
Executive Director
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Dear Mr. Ching:

We have the following comments on the Kakaako Community Development District (KCDD) Transit-Oriented Development (TOD) Overlay Plan Draft Environmental Impact Statement (DEIS) dated January 8, 2015:

Land Use

1. The DEIS acknowledges a shortage of active recreational spaces to accommodate the growing population in Kakaako but does not suggest mitigation measures. To the extent possible, the Final Environmental Impact Statement (FEIS) and the Kakaako Parks Master Plan should provide recommendations for providing new sports facilities within walking distance of the KCDD.

2. Despite a dramatic change in community character from an industrial neighborhood to an urban mixed-use community, the DEIS does not address the need for other community facilities such as libraries, community centers and senior centers that serve as gathering places and improve quality of life. These types of uses should be required as much as is practicable within new developments, particularly near the rail transit stations.

3. The DEIS indicates that the Hawaii Community Development Authority (HCDA) will exceed the requirements of the Kakaako Reserved Housing Rules (HAR §15-218) by encouraging units available to households that make less than 120 percent of the area media income. HCDA should also seek to extend the period of affordability to at least 30 years, if not 60 years or perpetuity, to maintain the affordability of these units. This is particularly important near the rail transit stations because lower income households will particularly benefit from the affordable access that the rail system will provide.

4. The DEIS continues to posit a variety of changes to the Neal S. Blaisdell Center (Blaisdell Center) site. The City and County of Honolulu is currently undergoing an economic feasibility and master planning process to determine the future of Blaisdell Center based on community feedback and technical analysis. While the City appreciates that the HCDA must anticipate potential future uses of the site, the FEIS should remove extensive details that do not correspond with the City's actual intentions, such as expanding Thomas Square Park to where the concert hall exists today.

5. The proposed view preservation zone, which cuts diagonally through the Blaisdell Center site, may severely limit the City's redevelopment options for Blaisdell Center and should be removed. This view does not exist today and will be difficult to administer since it does not follow a public street.

6. The KCDD TOD Overlay Plan should prohibit or discourage auto-oriented uses such as drive-through facilities and automobile repair and sales near the rail stations.

Infrastructure

7. Storm drainage in the KCDD is acknowledged to be a recurring problem, yet no measures are proposed to remedy the situation despite upwards of billions of dollars of private investment and a change in neighborhood character from industrial to high-rise urban. The FEIS should explore potential drainage improvements, including low-impact development (LID) concepts.

Transportation

8. A program schedule should be provided in the FEIS specifying when sidewalk improvements, in particular in areas around transit stations, will be constructed.

9. Several figures in the DEIS indicate that Kona Street, between Pensacola Street and Piikoi Street, will be converted to two-way operation. This should be revised to indicate that Waimanu Street has already been converted to two-way operation.

10. Exhibits showing proposed bicycle and pedestrian connections should extend beyond the KCDD boundaries to show connection to a coherent regional circulation system. It is not clear whether this is the case from the diagrams provided in the DEIS.

11. It is unclear if the new roadways bounded by Ward Avenue, Queen Street, Kamakee Street and Auahi Street, as shown within the Howard Hughes development area, are planned by the landowner.

12. Likewise, it is unclear if the landowner plans to extend Pohukaina Street to be a vehicular connection to Ward Avenue or Auahi Street. The anticipated schedule of when this will be needed and constructed should also be described in the FEIS.

13. The proposed roadway sections in the DEIS are still being reviewed by the Traffic Review Branch. More detailed comments will be provided when more information is available with regard to the anticipated travel characteristics of motorists, bicyclists, pedestrians and transit users.

14. Plans to convert South Street, between Pohukaina Street and Queen Street, to two-way operation should be included in the FEIS.

15. Consideration to convert Punchbowl Street to two-way operation should also be included.

Should you have any questions regarding these comments, please contact Renee Espiau of our staff at 768-8050.

Very truly yours,

George I. Atta

George I. Atta, FAICP
Director

GA:kh

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Ref. No.: PL TOD 18.3

June 10, 2015

Mr. George Atta, FAICP, LEED AP, CEI
Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. Atta:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 23, 2015 commenting on the above document. Following are HCDA's responses to your comments in the order they were presented in your letter.

1. As HCDA's parks master planning process has just gotten underway, it will not be concluded in time for its recommendations to be included in the FEIS. This is why the process is identified as an Unresolved Issue in Chapter Six, Section 6.6 of the DEIS.

2. HCDA concurs that community facilities are an important element of a vibrant community. To that end, we are engaged in ongoing discussions with the DOE about the provision of school and education related facilities within the Kakaako Community Development District (KCDD). Each mixed-use residential development within the KCDD is required to provide fifty-five square feet of recreation space per dwelling unit, which can be provided as indoor or outdoor space and serve as a gathering place for the residents of the development. This requirement is applied uniformly to market as well as affordable housing projects including elderly housing projects. HCDA has also established an indoor community gathering place on the ground floor of the historic American Brewery Building adjacent to the Honuakaha affordable housing project.

In addition, with each new development project the HCDA seeks to establish community gathering places that are accessible to the general public, examples of which are evident in the Ward Neighborhood Master Plan and the Kamehameha Schools' Kaiāulu 'O Kaka'ako Master Plan.

3. We will consider your recommendation regarding the extension of the period of affordability.

4. The HCDA shares the City's and the general public's concern regarding the apparent deficiency of park space within the KCDD. Neal S. Blaisdell Center is a 22-acre publicly owned property in the heart of Kakaako as well as urban Honolulu that has tremendous redevelopment potential. Therefore, in recognition of the City's as well as the general public's concern regarding the lack of park space in urban Honolulu, the HCDA is merely suggesting in the TOD Overlay Plan that the City's anticipated redevelopment of the property could present a real opportunity to expand parks and public facilities in urban Honolulu. The discussion on redevelopment of the Neal S. Blaisdell Center is framed as a potential redevelopment scenario and the HCDA does not believe that the discussion in any way limits the City's potential redevelopment plan for the property.

5. The Mauka Area Plan as well as the City & County's Primary Urban Center Development Plan emphasize the need to preserve mauka-makai views within the Primary Urban Center. Given the already existing development in urban Honolulu, it is impractical and unfeasible to maintain a panoramic mauka-makai view in the urban area. Given that, the HCDA's intent in the Mauka Area Plan is to preserve mauka-makai views along major mauka-makai streets and key mauka-makai view corridors. To that effect, the Mauka Area Plan and Rules identify Punchbowl Street, South Street, Cooke Street, Ward Avenue, Kamakee Street, and Piikoi Street as view corridor streets. Since South Street, Cooke Street, and Ward Avenue

have bends in them, it was necessary to create view preservation zones so that the mauka-makai view throughout the whole length of the street could be preserved. HCDA acknowledges the comments regarding the view preservation zone through the Blaisdell Center property. However, we believe that view preservation is a public benefit that both HCDA and City should support.

6. We appreciate the recommendation and will take it up during rule-making for the TOD Overlay Plan.

7. HCDA is committed to requiring the implementation of low-impact development concepts for drainage in as much as low impact drainage can be achieved in a dense urban environment.

8. Street right of ways within the KCDD belong to the City. As such HCDA believes that routine improvements and maintenance falls under the purview of the City.

9. The requested revisions have been made.

10. We have determined that this change is not necessary on the maps. To show the bicycle and pedestrian connections extending beyond the KCDD would likely confuse the reader by suggesting that the larger regional system is the responsibility of HCDA. The TOD Overlay Plan is limited to the KCDD.

11. The draft Transit Oriented Development Overlay Plan presents some opportunities for potential future street connections within the KCDD. Within the area bounded by Ward Avenue, Queen Street, Kamakee Street, and Auahi Street, the landowner has already committed to extend Halekauwila Street to Kamakee Street. HCDA is working with the landowner to explore other connection possibilities.

12. The Mauka Area Plan and Rules clearly indicate Pohukaina Street is to be extended to join with Auahi Street on the Diamondhead side of Ward Avenue. Construction of this extension will be dependent on HCDA receiving CIP funds from the Legislature to construct the improvements.

13. Acknowledged.

14. Comment acknowledged.

15. Comment acknowledged.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

16835

PARTMENT OF FACILITY MAINTENANCE

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IN REPLY REFER TO:
DRM 15-127

February 25, 2015

Mr. Anthony J. H. Ching
Executive Director
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Dear Mr. Ching:

SUBJECT: Draft Environmental Impact Statement for the Transit-Oriented Development (TOD) Overlay – Kakaako Community Development District, Honolulu (Primary Urban Center)

Thank you for the opportunity to review and provide our input regarding the above subject project.

The following are our comments and concerns:

- We have no comments at this time, since Hawaii Community Development Authority's (HCDA) recommendations in this Draft TOD Overlay Plan are only strategies and not required improvements. Please keep the Department of Facility Maintenance updated as this project progresses.

Following are general comments for any of the recommended improvements that are approved:

- Provide necessary Best Management Practices for the project site including the catch basin located along abutting streets (City, State DOT Highways, State HCDA and Private).

- All work to be performed within City-owned streets right-of-way, which abuts the subject project, shall require the proper City permits (Street Usage Permit, Grading/Trenching Permit, etc.).
- All work within the City streets right-of-way shall be to City Standards.
- All damages to existing City's infrastructure(s) shall be repaired or replaced in-kind using the same or alternate City approved material(s), with all work to be accepted by the City and at the cost to the contractor.
- As part of this study, is HCDA also doing annual maintenance cost of the surrounding infrastructures that are recommended to be constructed as part of this project? This information will be essential to the various government or private agencies in their short- and long-range maintenance budget planning to assure minimal impact on the environment and public safety.

If you have any questions, please call Mr. Kyle Oyasato of the Division of Road Maintenance at 768-3697.

Sincerely,

Ross S. Sasamura, P.E.
Director and Chief Engineer

cc: Lee Sichter LLC
45024 Malulani Street, #1
Kaneohe, Hawaii 96744

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

David Y. Ige
Governor

John Whalen
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Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Ross S. Sasamura, P.E.
Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
1000 Uluohia Street, Suite 215
Kapolei, Hawaii 96707

Dear Mr. Sasamura:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 25, 2015 commenting on the above document. We acknowledge your statement that you have no specific comments about the Proposed Action at this time. HCDA also acknowledges and agrees with your general comments concerning BMPs, the need for proper City permits, compliance with City standards, and obligations for repairs to damaged infrastructure. With regard to annual maintenance cost estimates, it is HCDA's intent, as provided in §206E-6, Hawaii Revised Statutes, to dedicate infrastructure improvements undertaken by HCDA to the City & County of Honolulu ("City"). Once dedication of the infrastructure to the City is completed, it is intended that maintenance of the infrastructure will be within the purview of the City.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

16839

PHONE (808) 594-1888

FAX (808) 594-1938

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
560 N. NIMITZ HWY., SUITE 200
HONOLULU, HAWAI'I 96817

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HRD15/7362

February 23, 2015

Anthony J. H. Ching, Executive Director
Hawai'i Community Development Kaka'ako Kalaeloa
461 Cooke Street
Honolulu, HI 96813

Re: Draft Environmental Impact Statement for the Kaka'ako Community Development District Draft Transit-Oriented Development Overlay Plan (File no. PL TOD 18.2)
Honolulu Ahupua'a, Kona Moku, O'ahu
Tax map key (1) 1-5-010:012

Aloha Mr. Ching:

The Office of Hawaiian Affairs (OHA) is in receipt of your December 18, 2014 letter requesting comments on the draft environmental impact statement (DEIS) for the Kaka'ako Community Development District Draft Transit-Oriented Development Overlay Plan.

The Kaka'ako Community Development District (KCDD) is 601.6 acres, stretching between the Punchbowl district to the north, Ala Moana Shopping Center and Waikīkī to the east, and the Downtown area and Honolulu Harbor to the west. However, for planning purposes the total area is divided between Kaka'ako mauka, and Kaka'ako makai. The proposed actions will occur predominantly in the mauka area, where there are planned transformations towards a truly urban, high-rise, 24-hour, mixed-use neighborhood. No changes are planned for the makai area. In 2012, the Honolulu Authority for Rapid Transportation (HART) elevated light-rail transit system identified three transit stations within the KCDD: two in Kaka'ako mauka, the Civic Center and Kaka'ako station; and one at the Aloha Tower Special District, Downtown station.

OHA is aware that the DEIS has been prepared to address the future opportunities presented by the introduction of an elevated light-rail system and to disclose the impacts of the

additional development occurring from the light rail system. All impacts are accounting for full build-out by 2035.

OHA appreciates the efforts in the plan to allow for diversified transportation--from public transportation such as the bus, to bicycle, and pedestrian access--by providing comfortable sidewalks, walkable communities, and quality pedestrian and bicycle access. The diversification will decrease traffic congestion, and promote walkable communities by reducing the need for short inefficient auto trips. In addition, specific integrations in the design create a modal hierarchy based on pedestrian first followed by public transit, bicycles, and autos.

The KCDD does not discuss improvement for water and sewage lines, which will be challenged by the high growth of housing, jobs, and overall individuals in the area. The plan states that "no modification to the solid waste disposal program within the Mauka Area is proposed,"[1] bringing further concerns of capacity for the added population in the district. The plan has the private contractors filling the need, stating that the "expansion of private contractor provided collection services might be required to meet future increased demands."[2]

OHA's main concern lies with the high likelihood of iwi kūpuna being disturbed during ground altering activities. The area is known for a high concentration of iwi, especially along the ancient shoreline sand deposits. In addition, in the mauka area there are four large documented cemeteries: Ka'ākaukukui Cemetery, Honuakaha Smallpox Cemetery, Kawaiaha'o Cemetery, and the King Street Roman Catholic Cemetery. Also, hundreds of unmarked burials were discovered along Nimitz Highway and Ala Moana Boulevard.

As with all subsurface ground disturbances, OHA does request assurances that should iwi kūpuna or Native Hawaiian cultural deposits be identified during any other ground altering activities, all work will immediately cease and the appropriate agencies, including OHA, will be contacted pursuant to applicable law. Given that the KCDD contemplates significant development in this area, we ask that the HCDA takes step to ensure that future developers are made aware of these procedures, as well.

Mahalo for the opportunity to consult. Should you have any questions, please contact Jeannin Jeremiah at 594-1790 or by email at jeanninj@oha.org.

'O wau iho nō me ka 'oia 'i'o,

Kamana'opono M. Crabbe, Ph.D.
Ka Pouhana, Chief Executive Officer

KC:jj

[1] Draft Environmental Impact Statement Kaka'ako Community Development District Draft Transit-Oriented Development Overlay Plan, Chapter Two: Description of Proposed Action 37.
[2] Id.

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
Governor

John Whalen
Chairperson

Anthony J. H. Ching
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Ref. No.: PL TOD 18.3

June 10, 2015

Kamana`opono M. Crabbe, Ph.D.
Ka Pouhana, Chief Executive Officer
Office of Hawaiian Affairs
State of Hawaii
560 North Nimitz Highway, Suite 200
Honolulu, Hawaii 96817

Dear Dr. Crabbe:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 23, 2015 commenting on the above document. Following are our responses to your comments in the order they were presented in your letter.

1. The EIS does, in fact, identify specific improvements for water and sewer lines, but offers no timetable for implementing those improvements. Please refer to Chapter Four, Section 4.11.1.2 for identified water improvements, and Section 4.11.2.2 for sewer improvements.

2. We would like to clarify any misunderstanding regarding solid waste collection. The practice of private buildings being serviced by private collection companies will continue into the future as new, privately-owned buildings are constructed. Thus, there will be no change to this protocol. This should not be interpreted to mean that solid waste collection will be ignored. It will in fact be required, but will not place a burden on the City's collection services.

3. HCDA shares your concern regarding *iwi kūpuna* and is committed to adhering to the SHPD's requisite protocol regarding inadvertent finds including contacting various agencies as required by law. Future developers will be informed of these obligations as well.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

DAVID Y. IGE
GOVERNOR OF HAWAII

JESSICA E. WOOLEY
DIRECTOR

STATE OF HAWAI'I
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
Department of Health
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813
Telephone (808) 586-4185
Facsimile (808) 586-4186
Email: oeqchawaii@doh.hawaii.gov

File No
OEQC 15-009

February 23, 2015

Mr. Anthony Ching, Executive Director
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

Attn: Ms. Amy Mutart

Dear Mr. Ching,

SUBJECT: Comments on Draft Environmental Impact Statement for the Kaka'ako Community Development District Draft Transit-Oriented Development Overlay Plan

The Office of Environmental Quality Control has reviewed the Draft Environmental Impact Statement (EIS) for the Kaka'ako Community Development District (KCDD) Draft Transit-Oriented Development (TOD) Overlay Plan, and offers the following comments for your consideration.

1. We note the Hawaii Community Development Authority (HCDA) is stated as the Applicant (for the EIS) in Section 1.5 on page 17. Pursuant to Chapter 343 HRS, for this subject agency action, HCDA is technically the Proposing and Determination agency, and not an Applicant.
2. The Executive Summary, which may be the extent of the document read by some lay persons, includes some concepts and technical terms that could stand clarification, such as: "surcharged" in the discussion on wastewater (pg. 8); how the bullet point on pg. 9 that states "The Proposed Action will generate up to a 16% increase in motor vehicle trips over the Future Baseline" is consistent with the bullet point on pg. 10 indicating reduced air pollution will result from the Proposed Action; and significantly more detail on the topic of Improved Parking Options on pg. 11, which does not seem to connect with the limited discussion in Section 2.3.6.5 where parking is casually addressed in terms of Floor Area Ratio (FAR).
3. Describing what "floor plate controls" mean (in the bullet point under Urban Design in Section 1.3) may help lay readers come to a better understanding of the project. Additionally, the first paragraph in the discussion on Neighborhood Character in Section 2.3.1 would be much more lucid with a reference to a Figure to help explain how the TOD overlay apparently does not apply to the entirety of the KCDD-Mauka Area. This section also interjects the concepts of Neighborhood Master Plans and Land Blocks (in the

paragraph for the Auahi Neighborhood on pg. 10) and the City and County of Honolulu's Neighborhood TOD Plan (in the paragraph for the Aloha Tower Special District on pg. 13) without any discussion of the relevance of these planning documents or terms. Similar to above, the concepts of "progressive parking strategies or approaches" along with 'Transportation Demand Management strategies or measures" are briefly mentioned (in the Auahi Neighborhood's two paragraphs on TOD Alternative A & B), but this important community issue could use substantially more treatment throughout the document.

4. The treatment of considerations related to Sea-level Rise is generally quite thorough and commendable, particularly in the report included in Appendix B; however this important issue is then minimized in Section 4.4.2.1 of the main document, by the contention that 2035 is an appropriate planning horizon for the topic. While this time frame may be the relevant for various other issues addressed in the EIS, it seems appropriate to consider flooding throughout the expected lifespan of any building constructed during the planning horizon of 2035, which might very well approach the 2100 timeframe of significantly higher likelihood of sea level induced flooding.
5. Paragraph 4.7.5.2 discusses Year 2035 Roadway Conditions with the Proposed Action, and refers to Figure 4-17, which illustrates Proposed Street Connections under the proposed action and depicts numerous Opportunities for Service Streets. However, some accompanying discussion of such opportunities in the text would be very helpful. Further, many of the similar Figures in the Traffic section of the EIS are reproduced at such a small scale and with such light text as to make the information difficult to comprehend.
6. As you may realize, not every reader consumes the entire voluminous EIS document, but instead may look to specific sections that presumably address a particular concern. For many readers seeking to evaluate an action's impact on the environment, the discussion of Significance Criteria is one such section that may likely be read in isolation; we note in this case, the abbreviated discussion of these 13 criteria established by the rules implementing Hawaii's EIS process gives rather short shrift to the detailed information contained throughout the lengthy document. For example, the simple statement "that new development will employ energy savings strategies," could be significantly expanded to provide some detail on the important concern of a project's Energy Consumption. At a minimum, references could be made under each of the 13 Significance Criteria to appropriate discussions embedded elsewhere in the many hundreds of pages of material in the document.

Thank you for the opportunity to comment. If you have any specific questions or concerns, please contact Mr. Tom Eisen of my staff at (808) 586-4185 or by electronic mail at Thomas.Eisen@doh.hawaii.gov.

Sincerely,

Jessica Wooley

Jessica E. Wooley, Director
Office of Environmental Quality Control

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
Governor

John Whalen
Chairperson

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Ref. No.: PL TOD 18.3

June 10, 2015

Ms. Jessica E. Wooley, Director
Office of Environmental Quality Control
Department of Health
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Wooley:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 23, 2015 commenting on the above document. Following are our responses to your comments in the order they were presented in your letter.

1. The wording in Section 1.5 of Chapter One has been corrected.

2. An explanation of the term surcharge had been added to page 9. The language on page 10 has been clarified to indicate that the reference is to peak travel hours. Additional language has been added to Section 2.3.6.5 to summarize the Parking Policies and Incentives presented at the beginning of page 8-5 of Appendix A (the Draft TOD Overlay Plan).

3. A reference to the explanation of floor plate controls in Appendix A has been added to the bullet point in Section 1.3. With regard to your recommendation about a reference to a Figure in Section 2.3.1, that reference already exists in the first paragraph. The reference to Land Blocks has been deleted. However, given the extensive public discussions about the City's rail system and its planning, we feel that reference to the City's Neighborhood TOD Plan is not overly burdensome to the reader. A reference to the discussion of TDM strategies in the Draft TOD Overlay Plan has been added to the discussion in the Auahi Neighborhood description.

4. A clarification regarding building life has been added to Section 4.4.2.1.

5. A cross-reference to the relevant discussion in the Draft TOD Overlay Plan (Appendix A) has been added to the discussion in Section 4.7.5.2. With regard to your comment about general figure size, we recognize that the Figures in the printed document may be difficult to read for some. However, we would note that the DEIS was widely circulated in digital form, which allows a zoom-in feature for individual figures. The only printed copies distributed were requested by your agency, the City's Department of Planning and Permitting, and the State Department of Transportation. We received no requests for printed copies from the general public or private organizations.

6. We agree with your recommendation and have added cross-references to the discussion of Significance Criteria where appropriate.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

16842

DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

ARTHUR J. LOGAN
BRIGADIER GENERAL
ADJUTANT GENERAL

KENNETH S. HARA
COLONEL
DEPUTY ADJUTANT GENERAL

February 13, 2015

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HAWAII COMMUNITY DEVELOPMENT AUTHORITY

Ms. Amy Mutart
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawai'i 96813

Subject: Draft Environmental Impact Statement for the Transit-Oriented Development (TOD) Overlay Plan for the Kakaako Community Development District (KCDD)

Dear Ms. Mutart:

Thank you for the opportunity to comment on the above project. The State of Hawaii Department of Defense has no comments to offer relative to the project at this time.

Please contact this office upon completion of the Environment Assessment. If you have any questions or concerns, please have your staff contact Mr. Lloyd Maki, Assistant Chief Engineering Officer at (808) 733-4250.

Sincerely,

ARTHUR J. LOGAN
Brigadier General
Hawaii National Guard
Adjutant General

c: Ms. Havinne Okamura, Hawaii Emergency Management Agency

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAEOA

David Y. Ige
Governor

John Whalen
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Ref. No.: PL TOD 18.3

June 10, 2015

Brigadier General Arthur J. Logan
Hawaii National Guard
Office of the Adjutant General
Department of Defense
State of Hawaii
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

Dear Brigadier General Logan:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 13, 2015 commenting on the above document. We acknowledge that you have no comments at this time.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

16831

DAVID Y. IGE
GOVERNOR
STATE OF HAWAII

SHAN S. TSUTSUI
LT. GOVERNOR
STATE OF HAWAII

JOBIE M. K. MASAGATANI
CHAIRMAN
HAWAIIAN HOMES COMMISSION

WILLIAM J. AILA, JR.
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

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HAWAII COMMUNITY DEVELOPMENT AUTHORITY

February 20, 2015

Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawaii 96813

To Whom It May Concern:

Subject: Draft Environmental Impact Statement (DEIS) for the Transit Oriented Development (TOD) Overlay Plan for the Kaka'ako Community Development District (KCDD), Multiple TMK's, Kaka'ako, O'ahu

Mahalo for consulting with the Department of Hawaiian Home Lands (DHHL) regarding the subject DEIS. DHHL supports the general concept of TOD and has been monitoring Honolulu City and County's planning process in this regard. DHHL supports the implementation of a system that provides incentives for improvements to infrastructure capacity. Such improvements could potentially facilitate the development of future DHHL projects and are designed to offset impacts from increased densities in the urban core, therefore improving the quality of life for our beneficiaries as well as the general public.

Please also consult with the Kewalo Hawaiian Homestead Association and the Papakolea Community Development Corporation as they may have programs, projects, or activities that could benefit from the proposed TOD.

The Department of Hawaiian Home Lands has no other comments to offer at this time. If you have any questions or require more information, please contact the Planning Office at 620-9517. Mahalo again for the opportunity to participate in the environmental review process.

Aloha,

Marvin Kaleo Manuel
Acting Planning Program Manager

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

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Governor

John Whalen
Chairperson

Anthony J. H. Ching
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Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Marvin Kaleo Manuel
Acting Planning Program Manager
Department of Hawaiian Home Lands
State of Hawaii
P. O. Box 1879
Honolulu, Hawaii 96805

Dear Mr. Manuel:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 20, 2015 commenting on the above document. We appreciate your Department's support of the general concept of TOD and will endeavor to consult with the Kewalo Hawaiian Homestead Association and the Papakolea Community Development Corporation as projects emerge that could potentially benefit them.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

KAMEHAMEHA SCHOOLS

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16834

February 23, 2015

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Ms. Amy Mutart, Project Manager
Hawaii Community Development Authority
461 Cooke Street
Honolulu, Hawai'i 96813
Phone: (808) 594-0334

SUBJECT: Comments by Kamehameha Schools to the TOD Overlay Plan Draft Environmental Impact Statement noticed on January 8, 2015 (the "DEIS"), for the Implementation of Transit-Oriented Development in the Kaka'ako Community District (the "Proposed Action")

Dear Ms. Mutart:

Kamehameha Schools ("KS") maintains its general support of the Proposed Action, which (a) provides an incentive zoning method where developers may elect to provide amenities in exchange for additional development rights, (b) recognizes, and does restrict or impose additional conditions on the development of KS' lands under its vested Master Plan (PL MASP 13.2.8) approved by the Authority on September 9, 2009, and the Mauka Area Rules then in effect (part of the "*Future Baseline*"), (c) attempts to be closely coordinated with the development plans of KS, and (d) allows a developer of KS' lands covered by its Master Plan to opt in to the incentive zoning program.

THE DEIS provides that public funds will be used for the on-going maintenance of publicly owned streets, and the improvements to the facilities envisioned by the Proposed Action may be implemented at the discretion of the overseeing agency, including the City and County of Honolulu (the "City"). KS reiterates that KS and other owners (including apartment owners) are paying real property taxes to the City to design, construct, repair, and maintain roadways and related infrastructure in Kaka'ako, including liability for the same. Such costs of, and liability for, such the improvements made to public property pursuant to the Proposed Action should rest with the City or the Authority and not shifted to private projects developed under the Future Baseline. Because the establishment of an Improvement District is not within the purview of the Proposed Action or the DEIS, it should not be imposed on residents and property owners in Kaka'ako.

The Complete Streets program is an integral component of the Proposed Action and KS supports this program throughout the district to create a more pedestrian and bicycle friendly environment. A key aspect of the Complete Streets program is to coordinate its implementation with the City, as the owner

567 South King Street • Honolulu, Hawai'i 96813-3036 • Phone: 808-523-6200
Founded and Endowed by the Legacy of Princess Bernice Pauahi Bishop

of most streets in the district. With the City's enactment of Ordinance 12-15 (2012) titled "*Complete Streets*," the Authority should describe how it intends to work with the City, so that complete street components, such as nonstandard roadway widths and surfaces, pedestrian friendly special sidewalk treatments and uses are approved and accepted by the City. Without such coordination, complete streets may not be realized.

As described above, KS' support is conditioned on the Proposed Action's recognition of KS' vested development rights. KS' Master Plan envisions programmed open spaces, permeability between adjacent projects, local serving commercial development along key streets such as Auahi Street, and the creation of pedestrian and bike friendly environments to improve connectivity in our master planned area. Any significant alteration to existing roadways or the creation of new un-programmed road linkages in the mauka district would hamper this vision and require rigorous study, public discussion, and consensus among all key stakeholders.

Our concern is specifically directed at recent discussions of opening Auahi Street to connect to Ward Avenue. The DEIS and the Proposed Action specifically provide that Auahi Street between Ward Avenue and Ahui Street be "*Closed to Autos (Pedestrian Connection Only)*" (Figure 5-9 "*Current KCDD Street Grid and Potential Future Connections*," the relevant portion is attached hereto). Further, the Authority's previous and current Mauka Area Plans and the recent Final Supplemental EIS for the current Mauka Area Plan (the "Final EIS") all show that Auahi Street as closed to vehicular traffic (Figure 2-5 "*Roadway Network*," the relevant portion is attached hereto). KS cannot support any consideration for opening Auahi Street and any delay in the realignment of Auahi Street to connect to Pohukaina Street, as shown on the attached, without further study, including supplements to the DEIS and the Final EIS. The scope of any "temporary" opening of Auahi Street to evaluate traffic impacts should be carefully evaluated (whether such action is permitted or necessary) and its terms and conditions limited in scope and duration to prevent short and long-term adverse effects on businesses along Auahi Street and to maintain pedestrian and vehicular safety within the district.

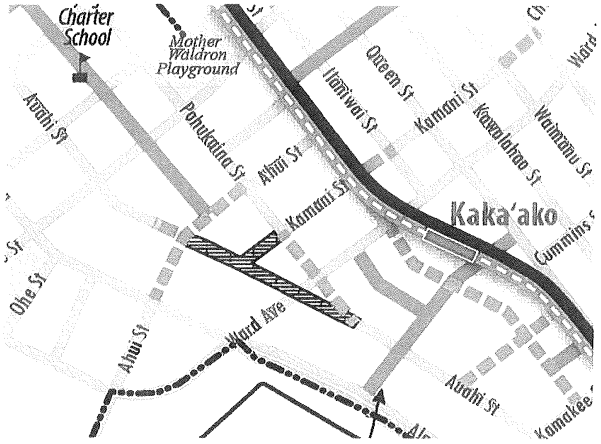
We appreciate the opportunity to provide these comments and look forward to participating with an open discussion on critical issues that will need to be addressed moving forward.

Sincerely,

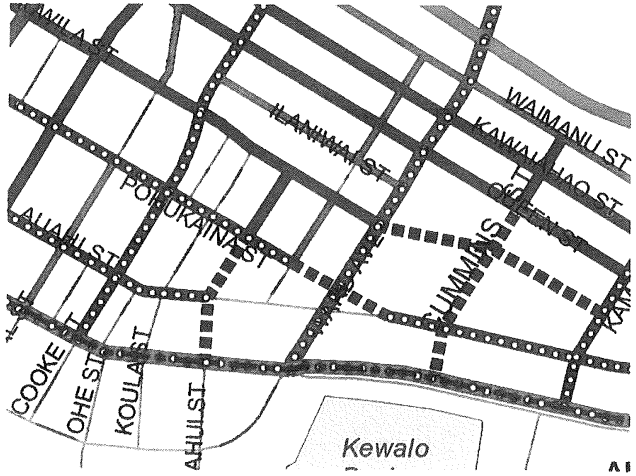
Kamehameha Schools

Walter F. Thoemmes III

Portion of Figure 5-9 on page 5-16 of Appendix A (Draft TOD Overlay Plan) of the DEIS:



Portion of Figure 2-5 Roadway Network from Final Supplemental EIS accepted on November 3, 2010:



HAWAII COMMUNITY
DEVELOPMENT AUTHORITY

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Ref. No.: PL TOD 18.3

June 10, 2015

Mr. Walter Thoemmes, III
Chief of Staff
Kamehameha Schools
567 South King Street, Suite 200
Honolulu, Hawaii 96813-3036

Dear Mr. Thoemmes:

Response to Comments
TOD Overlay Plan Draft EIS
Kakaako, Honolulu, Hawaii

I am writing in response to your letter dated February 23, 2015 commenting on the above document. Following are our responses to your comments in the order they were presented in your letter.

1. We appreciate your general support of the Transit Oriented Development Overlay Plan.

2. We acknowledge your preference that future improvements to roadways and infrastructure should be funded by the overseeing agency and not be shifted to private development projects. Your opposition to the establishment of an Improvement District is noted.

3. HCDA is committed to working with the City to coordinate the implementation of Complete Streets in Kakaako. This collaboration has already begun to occur, in the form of meetings with the Department of Transportation Services. In addition, applications for development permits are submitted to the City for review and comment.

4. HCDA supports the vested development rights of Kamehameha Schools. We acknowledge your concerns about the possible opening of Auahi Street. However, as you noted in your letter, the roadways in Kakaako are under the authority of the City and County of Honolulu. While HCDA can raise

your concerns, it does not have final say over decision making by the City.

Mahalo for participating in the Chapter 343, Hawaii Revised Statutes, environmental impact statement review process.

Sincerely,

Anthony J. H. Ching
Executive Director

AJHC/DN

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO COMMUNITY DEVELOPMENT DISTRICT

TOD OVERLAY PLAN
FINAL ~~DRAFT~~ ENVIRONMENTAL IMPACT STATEMENT

VOLUME TWO

June 10, 2015
~~January 8, 2015~~

Printed on 100% recycled paper

Kaka`ako Community Development District

TOD Overlay Plan
Final Environmental Impact Statement

Master Table of Contents

(Please note: each Chapter begins with its own detailed table of contents.)

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Draft TOD Overlay Plan

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKA`AKO COMMUNITY DEVELOPMENT DISTRICT

TOD OVERLAY PLAN

DRAFT

May 20, 2013

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Lee Sichter LLC

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VIA

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1 INTRODUCTION

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URBAN SYNERGY IN KAKA`AKO

"As a net is made up of a series of ties, so everything in this world is connected by a series of ties. If anyone thinks that the mesh of a net is an independent, isolated thing, he is mistaken. It is called a net because it is made up of a series of interconnected meshes, and each mesh has its place and responsibility in relation to other meshes."

- The Buddha

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O`ahu development patterns
prior to Western contact
1778 AD

"Planning for indefinite expansion is now wasteful and obsolete. The city of the future will have a better sense of its natural limits: it will attempt to make the most of what it has, rather than to evade its actual difficulties and its actual deterioration by encouraging its population to move out to the outskirts and permit the interiors to become more completely blighted. Good planning means rehabilitation: it means beginning over again and doing the job right."

—Lewis Mumford, *Whither Honolulu? (1939)*

O`ahu development patterns now
2012 AD

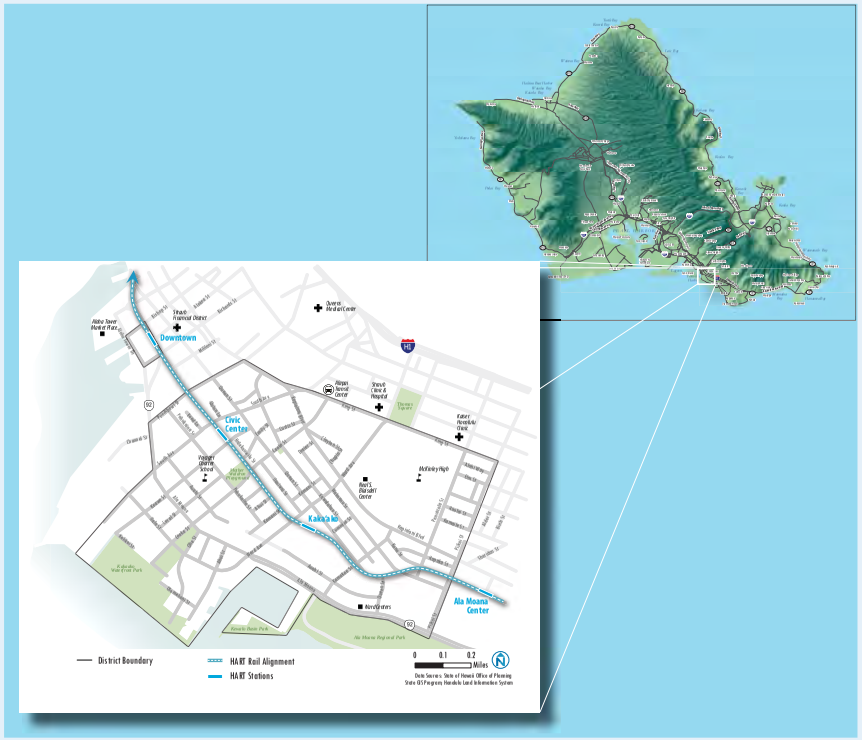
DRAFT

DEFINITIONS & CONTEXT

**Kaka`ako Community Development District (KCDD):** Upon passage of Chapter 206E, Hawaii Revised Statutes Kaka`ako was designated as the first Community Development District under the Hawaii Community Development Authority (HCDA)—a public corporate entity responsible for planning and revitalizing redevelopment areas. Legislators found that Kaka`ako was significantly underdeveloped and under utilized relative to its central location in urban Honolulu. The 601.6-acre KCDD, pictured below, is bounded by King Street on the north, Piikoi Street and Ala Moana Regional Park on the east, Punchbowl Street and the property line between Pier 2 and Pier 4 on the west, and the Pacific Ocean on the south. HCDA was then given jurisdiction over the 3.4-acre Aloha Tower Special District in Downtown Honolulu. The Aloha Tower Special District is located on the makai side of Ala Moana Boulevard and is bounded by Richard Street, Bishop Street, and Aloha Tower Drive.

TOD Overlay: HCDA recognizes the need to leverage existing transit services to develop a transit-oriented community. In 2012, Honolulu City Council's approval of an elevated fixed rail system to extend from East Kapolei to Honolulu and include three new rapid transit stations in the KCDD further validated the need to develop a plan and rules to guide transit-oriented development (TOD). The new rules would be enacted as an "overlay" to the existing district rules.

TOD Overlay Plan: The TOD Overlay Plan represents a comprehensive analysis of the issues and opportunities associated with TOD in Kaka`ako. Once an environmental impact statement disclosing the anticipated impacts of TOD is prepared and accepted, rules will be adopted that will guide TOD in the KCDD.



1 INTRODUCTION

PROJECT PURPOSE

The Hawai`i Community Development Authority (HCDA) and the Kaka`ako community have a vision for the Kaka`ako Community Development District (KCDD) to be a sustainable, highly livable, culturally vibrant, economically strong, healthy, and walkable urban neighborhood. This vision is manifested in the Kaka`ako Mauka Area Plan and Rules as well as in the Makai Area Plan and Rules. HCDA plans to work with many partners to develop the district into an internally diverse network of housing, businesses and amenities; while simultaneously strengthening the district's critical role in preserving the health of greater urban Honolulu.

The Kaka`ako Community Development District's (KCDD) Transit Oriented Development Plan and Rules Overlay (TOD Overlay Plan) enhances the policies and direction set forth in the previously established district plans and rules by maximizing development through the use of smart growth principles, multi-modal transportation, and walkable neighborhood design. The intention of the TOD Overlay Plan is to foster development that creates well-used and well-loved urban places that are safe, comfortable, diverse, attractive and representative of the diverse character in the Kaka`ako community, while providing safe and comfortable streets and convenient access to the district's three future Honolulu Authority for Rapid Transit (HART) stations.

Figure 1-1 Elements of Transit-Oriented Development in KCDD

Mobility & Access **Available Services** **Redevelopment Potential**

Transit-oriented neighborhoods are places that, by their design, allow people to drive less and walk, cycle, and take transit more. This is achieved by concentrating higher-density, mixed-use, human scale development around transit stops and stations. Transit-oriented neighborhoods provide **mobility and access** through well-connected and well-designed networks of streets, creating walking- and cycling-friendly streets. Such places help to reduce unnecessary auto travel by locating a wide range of needed **services** close to where people live and work. Transit-oriented neighborhoods allow developers to build more efficiently, maximizing the use of space for productive uses such as housing, offices, entertainment, retail, and services. Communities built in this way have proven to be particularly livable, sustainable, and resilient places.

Image from HCDA

Typical weekday peak traffic congestion on Lunalilo Freeway (H1). Due to Honolulu's geographic constraints, travel demand is funneled into a limited number of Ewa-Koko Head corridors.
Image from Flickr user Casey Serin

WHY A TRANSIT-ORIENTED KCDD MATTERS FOR O`AHU

Honolulu and urban O`ahu are regarded as places of great natural beauty with a unique quality of life. However, O`ahu faces a number of challenges including high housing costs, high energy prices, high levels of traffic congestion and auto dependence, increasing obesity rates, urban design that restricts walking and healthy activities, and a high level of dependence on imported oil for energy and mobility.

- **Honolulu has among the most expensive housing in the nation**—the median housing price in Honolulu is $576,500[1]
- **Honolulu is highly reliant on fossil fuels**—over 90% of energy consumed in Hawai`i is from imported petroleum[2]
- **Honolulu has the worst traffic congestion in the nation**—the average driver spent 58 hours in traffic in 2012[3]
- **10 square miles of land were developed** on O`ahu between 1992 and 2005[4]

Transit-oriented development can help to address each of these challenges, particularly in urban areas where good bus service and pedestrian infrastructure is already in place, amenities and services are abundant, and is in close proximity to major job centers. The KCDD represents the region's best opportunity to create a rich urban neighborhood that reduces per capita demands on energy, land, and other valuable resources, creates affordable housing opportunities, and reduces the overall cost and impact of living, while simultaneously building a culturally rich and vital urban neighborhood in the heart of urban Honolulu. This is no small feat; it is necessary to address threats to Honolulu's livability and environment.

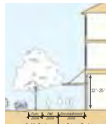
1 US Census Bureau, American Community Survey, 2011.
2 US Energy Information Administration, Hawaii Energy Profile, 2009.
3 Inrix National Travel Scorecard. 2013. Accessed at http://scorecard.inrix.com/scorecard/default.asp. 2013.
4 Developed areas assessed based on Coastal Change Analysis Program and 2005 Hawaii Land Cover datasets, NOAA Coastal Services Center, 2009.

PROJECT BACKGROUND/CONTEXT

Policy Context

This TOD Overlay Plan evolves from a rich history of planning for urban Honolulu and the Kaka`ako community. The coming introduction of rail transit - in parallel with community driven interest in creating a city that is highly walkable, friendly and safe for cyclists - is an impetus for this plan. However, a changing transportation paradigm is only a representation of a much broader movement to bring vitality to urban Honolulu, reflecting the values of native Hawai`ian culture, particularly stewardship of land and environment, preservation of native culture, openness to the visiting world, and responsibility to local people and their prosperity.

This plan builds directly on the Mauka Area Plan and Rules and the Makai Area Plan and Rules and references many other important guiding plans and policies.



Mauka Area Plan and Rules was adopted in the fall of 2011. This plan provides the strongest policy foundation for the district, as it was developed around Smart Growth principles, placing high value on sustainable development, quality urban form, and creation of walkable streets and pedestrian scale environments. The Mauka Area Plan and Rules were developed with the anticipation for an additional overlay that would enhance the Smart Growth principles established in its guidelines. Thus, this TOD Overlay Plan functions as an extension and not only translates the principles in the Mauka Area Plan and Rules to other parts of the district, but also is developed to integrate district development, transportation networks and active public spaces into a tightly-knit network.

PUC

Primary Urban Center: Development Plan. The PUC Development Plan addresses O`ahu's Primary Urban Center, including Kaka`ako, as it functions as a critical piece of O`ahu's overall development pattern. The PUC plan implements the community's vision for the urban center as expressed in the O`ahu General Plan and outlines necessary actions in order to accomplish the vision. The actions focus on land use, transportation, infrastructure and public facilities; all of which are important components of this TOD Overlay Plan. Specifically addressed are the land use and transportation sections that promote goals and ideas around:

- Protecting and Enhancing Natural, Cultural, and Scenic Resources
- Cultivating Livable Neighborhoods
- Promoting In-Town Housing Choices
- Developing Honolulu as Pacific's Leading City
- Creating a Balanced Transportation System

HAWAI'I 2050

**The Hawai`i 2050 Sustainability Plan** was developed as a "people's plan" with more than 10,500 participants. The Hawai`i 2050 Sustainability Plan addresses the future of Hawai`i through an economic, social and environmental lens, filtering a common ground that suggests ideas to encourage a long-term economic strength, environmental stewardship, and quality of life for Hawai`i's citizens and visitors. In 2011, the Hawai`i State Plan (Chapter 226, Hawai`i Revised Statutes), was amended to include the Hawai`i 2050 Plan's definition of sustainability. New priority guidelines and principles to promote sustainability were also added to the Hawai`i State Plan. As set forth in the State Plan, "Sustainability means achieving the following:

1. Respect of the culture, character, beauty, and history of the State's island communities;
2. Striking a balance between economic, social, community, and environmental priorities; and
3. Meeting the needs of the present without compromising the ability of the future generations to meet their own needs."

This TOD Overlay Plan recognizes the importance of long-range sustainability as a primary influence in the development and well-being of the Kaka`ako community. 2050 Plan principles permeate this Plan.

LEED-ND

LEED for Neighborhood Development. Offering a balance of ideas and smart growth principles at a neighborhood scale, this rating system was composed by great minds on the forefront of community building and environmental preservation. Their knowledge and case studies offered in the LEED ND manual present a means of translating global issues relating to green neighborhood development into individual diverse communities within Kaka`ako. The guiding elements in the manual are headlined under ideas such as Smart Locations and Linkages, Neighborhood Pattern and Design, and Green Infrastructure and Buildings.

MAPR

Makai Area Plan and Rules. As set forth in the 2011 Conceptual Plan for the Makai District, the area of the KCDD makai of Ala Moana Boulevard (and including the Aloha Tower Special District) is envisioned as the community's gathering place that welcomes all people with enriching cultural, recreational, and educational public uses. It will serve as a safe and secure place for neighboring residents and visitors; sustaining public uses on public-owned lands for the greater public good; offering enriching cultural facilities; incorporating a Hawai`ian sense of place in the design of area public facilities; and ensuring future sustainable operation of the area's public facilities. While the TOD Overlay Plan proposes no new development in the Makai District directly related to the proposed transit stations, it envisions the integration of the Complete Streets concept throughout the Mauka and Makai Districts.

Landowner Plans. The TOD Overlay is also closely coordinated with the development plans of the two major landowners in the KCDD: Kamehameha Schools and the Howard Hughes Corporation.

District Boundaries and Size

The TOD Overlay encompasses the entire Kaka`ako Community Development District (KCDD) including the Aloha Tower Special District. The KCDD is comprised of two areas, one of which is approximately 450 acres on the mountain (mauka) side of Ala Moana Boulevard bounded by Piikoi Street, Punchbowl Street and King Street ; hereinafter referred to as the "Mauka Area." The second area in the KKCD is approximately 151.6 acres on the ocean (makai) side of Ala Moana Boulevard bounded by Ala Moana Regional Park and the property line between Pier 2 and Pier 4 at the Honolulu Harbor shoreline; hereinafter referred to as the "Makai Area." The Aloha Tower Special District is comprised of approximately 3.4 acres located on the ocean side of Ala Moana Boulevard bounded by Richard Street, Bishop Street and Aloha Tower Drive. The total area addressed in the TOD Overlay Plan is approximately 605 acres.

The Kaka`ako Community Development District is composed of several sub-neighborhoods, each with its own unique character. With the exception of the Makai District and Aloha Tower Special District, these neighborhoods were defined in the Mauka Area Plan and Rules based on existing and emerging land uses, building forms, and land tenure patterns combined with the influences of major transportation corridors and adjacent districts. Each neighborhood will be influenced differently from the provisions laid forth in this Overlay. The intent of implementing transit oriented development is not to redefine the character of the existing neighborhoods, but to utilize TOD to enhance the existing quality of Kaka`ako as a whole.

Figure 1-2 Neighborhoods in the KCDD

The KCDD has nine neighborhoods each with their own emerging character predominant land use.
Source: Nelson\Nygaard

KAKA`AKO'S DIVERSE NEIGHBORHOODS

Pauahi is presented in the Mauka Area Plan as a mixed-use "urban village." The name of the neighborhood honors the legacy of Princess Bernice Pauahi Bishop, who is the benefactor of Kamehameha Schools - the major landowner in this area. HART's proposed Civic Center station is located within this neighborhood. The Mauka Area Plan envisions the Pauahi neighborhood as a high-rise area with pedestrian scaled podiums and active frontages. Several properties on the mauka side of Ala Moana Boulevard are owned by Kamehameha Schools. The implementation of the Kamehameha School's Master Plan will help to activate the Pauahi neighborhood and potentially areas along busy Ala Moana Boulevard.

Auahi is emerging as Kaka`ako's retail and entertainment center. Recent development has generated a marked increase in pedestrian activity, particularly in the vicinity of Auahi and Kamakee Streets. This activity is expected to multiply as the Howard Hughes Corporation, the majority land holder in this neighborhood, builds out its master plan. The Auahi neighborhood is envisioned to expand upon its retail and entertainment base providing active frontages and lively pedestrian environment with high-rise residential towers above. HART's proposed Kaka`ako Station is slated to be built on the master planned property making this district a gateway to Kaka`ako's Kewalo Basin Harbor and waterfront promenade for rail transit patrons.

Kapiolani is a neighborhood where land uses are strongly influenced by the busy Kapiolani Boulevard corridor. As a link between Downtown Honolulu and Waikiki, the Kapiolani corridor is an attractive location for high-rise mixed-use development, including retail stores, services and showrooms at grade level, and office and residential uses on higher floors. The continuous canopy of monkeypod trees and wide planting strip at the curb line lends a distinctive character to the corridor that enhances its value for future development and as a shaded, comfortable street for pedestrian traffic. The entire neighborhood is within a five minute walk from either a proposed HART station or one of TheBus transfer stations.

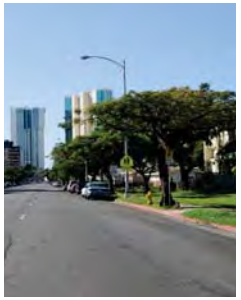
Thomas Square District is a neighborhood makai of the historic Thomas Square park.[1] The park is surrounded by properties that are home to some of Honolulu's major cultural and educational venues – the Honolulu Academy of the Arts, the Neal S. Blaisdell Center, and McKinley High School. The majority of the Thomas Square District land west of the park is owned by the City and County of Honolulu, Hawai`i State Department of Education, and the Hawaiian Electric Company. While there are no immediate redevelopment plans for the lands west of the park, these properties are in many ways ideal candidates for transit oriented redevelopment. The properties are large, relatively under-utilized, and well-connected to the urban grid and a wealth of services and amenities.

Aloha Tower Special District is a single property that is a part of a much larger neighborhood near downtown Honolulu. The property is owned by the Hawaiian Electric Company and is situated next to the Aloha Tower Marketplace and entertainment complex. It is immediately adjacent to HART's proposed downtown station. In early 2013, Hawai`i Pacific University secured the lease of the Aloha Tower Marketplace property and announced its intention to locate student dormitories on a portion of the property. This proposed use is consistent with and supportive of transit oriented development.

Central Kaka`ako is composed primarily of small lots with individual ownership. Predominate land uses in this area are service businesses, many with an industrial character, such as repair shops and production facilities. As a distinct reminder of the district's legacy as a light-industrial and residential community, Central Kaka`ako is valued as a convenient location for service businesses and this Plan intends to maintain the existing character because of the important role these businesses will play in providing services to the many new residents expected to move into the area. Significant redevelopment is not expected in this area because of the small lot size. However, some improvements are needed and there are opportunities to create more pedestrian tolerant linkages between other important redevelopment areas and HART stations.

1 While Blaisdell Center and the high school are situated within the Thomas Square District, Thomas Square Park and the Academy are not.

Civic Center is characterized by government and other important civic buildings spread out in a campus-like setting. Only a small portion of this neighborhood falls within the KCDD and therefore this Plan has relatively minor influence on the overall character of the neighborhood. HART's proposed Civic Center station will be located within a five minute walk from most government buildings providing employees convenient access to rail transit. Given the existing campus character and the scale and ambiance of the significant and historic buildings in this area, existing zoning parameters will remain in place. The TOD Overlay Plan is expected to have marginal direct impact.



Sheridan is predominately a residential neighborhood composed of small, fee simple lots. This established residential neighborhood also includes active commercial uses fronting King Street and the historic Makiki Christian Church located along Pensacola Street. The KCDD's Sheridan neighborhood area represents approximately half of the larger Sheridan Tract, which is bisected by Piikoi Street. The land use, small lot size, block size and land tenure patterns are very similar to the other half of Sheridan Tract, which is located on the Diamond Head side of Piikoi Street, just outside the KCDD. While some building renovations and redevelopment does occur in this area, the scale and pace of change is slight compared other areas of Kaka`ako. Residents in this neighborhood will be within walking distance of HART's proposed Ala Moana Station.

Purpose and Legislative Intent

The Hawai`i State Legislature created and empowered the Hawai`i Community Development Authority (HCDA) with the enactment of Chapter 206E, HRS with comprehensive planning, regulation and development responsibilities. Section 206E-33, HRS governs HCDA's planning and development activities to ensure that HCDA functions consistent with legislative intent. Although this Overlay, along with the current district plans and rules in its entirety, address all the policies defined in Section 206E-33, HRS, the TOD overlay focuses on rule 206E-33, HRS in light of the direct correlation to transit oriented development.

> *HRS 206E-33.3. Activities shall be located so as to provide primary reliance on public transportation and pedestrian facilities for internal circulation within the district or designated subareas.*

Plan Time Horizons

The planning horizon for the TOD Overlay Plan is 2035. The analysis conducted for the TOD Overlay Plan assumes 2013 as the baseline, but includes data assembled from prior years by the State of Hawai`i, the City and County of Honolulu, and the large landowners in the district.

TOD OVERLAY PLAN FORMAT

The KCDD TOD Overlay Plan is guided by a set of goals, objectives, and policies presented in Chapter 2 of this report. Several chapters set forth ideas, strategies, regulations, and implementing actions to realize the KCDD vision.

Chapter 2 Guiding Principles

Chapter 2 defines the goal of the TOD Overlay Plan as well as the objectives and policies that guide the recommendations set forth in subsequent chapters. Plan goals are organized around six key factors known to promote sustainable, transit-oriented development.

Chapter 3 Land Use

Chapter 3 describes the existing land use patterns in the KCDD and the principles and land use alternatives that can achieve plan goals. This chapter describes the results of a development propensity analysis that indicates where TOD is most viable and beneficial in the KCDD.

Chapter 4 Urban Design Framework

Chapter 4 describes principles for achieving a high quality and highly functional urban form including development of new high-rise buildings, view preservation, active public space, and development of community amenities.

Chapter 5 Mobility and Access

Chapter 5 describes how the development of a diverse and resilient transportation system supports the goals of the KCDD.

Chapter 6 Complete Streets

Chapter 6 describes a new framework for mobility and access in the KCDD - Complete Streets - and establishes basic street and intersection design principles to guide future street design and operation. Complete Streets are designed for all users, with priority given to the pedestrian and modes that prioritize efficient movement of people through the limited urban rights-of-way that must support new district development.

Chapter 7 HART Stations and Access

Chapter 7 describes the integration and role of the three HART rail transit stations in organizing development in the KCDD and needed improvements to ensure safe, efficient, and comfortable access for district residents and employees traveling by rail.

Chapter 8 Parking and Transportation Demand Management

Chapter 8 provides recommendations for managing parking in the KCDD, including policies and practices that allow developers to reduce the footprint and impact of parking on this increasingly urbanizing area. Further the chapter explores approaches to reducing unnecessary auto travel and parking demand, which are critical to developing walkable, vibrant, and interesting streets.

Chapter 9 Implementation - To Be Developed

Chapter 9 defines key steps for implementing the KCDD TOD Overlay Plan.

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2 GUIDING PRINCIPLES

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2 GUIDING PRINCIPLES

Kaka`ako Community Development District: A Sustainable Community

The TOD Overlay Plan is developed as a part of a long legacy of thought and consideration focused on improving the overall quality of the Kaka`ako Community Development District (KCDD). Located at the heart of the urban Honolulu area, KCDD is positioned to be an important growth center for the region. Residential and job growth located in this transit rich district can help to reduce consumption of land elsewhere on the island and lessen the environmental impacts of development and mobility by bringing jobs and residents to a complete neighborhood where they can shop, work, recreate, and find tranquility. The KCDD envisioned by this plan celebrates the great cultural history of the place, but does so with an urbanity, thoughtful design, and environmental consciousness previously unmatched in Hawaii.

Project Goals and Objectives

The goal of the TOD Overlay Plan is to develop the Kaka`ako community in ways that promote the shared values of livability, environmental, social and economic sustainability and resiliency in the face of change. The result must enhance the distinct character and history of the Kaka`ako community, and contribute to the environmental, social and economic health of the region. The TOD Overlay Plan is designed to seamlessly integrate with the district's three future Honolulu Authority for Rapid Transit (HART) stations and express the agency's dedication to placemaking through enhanced urban form.

The objectives and policies outlined on the following pages are based on the "6 D's" of pedestrian focused, transit-oriented, community development.

KAKA`AKO: AN EVOLVING URBAN COMMUNITY

If, like in many cities, food trucks, green business start-ups and redevelopment of light industrials buildings are the signs of a burgeoning cultural district and more significant redevelopment, then Kaka`ako is on the brink of something great.

Kaka`ako is:

Home to the City's Largest Food Truck Festival – Food PopUP in the Park
Image from Thomas Obungen

A Hub for Technology Business Startups
Image from The Box Jelly

Home of the Greenhouse Innovation Hub
Image from Sean Nakamura

DRAFT

The Fruitvale BART Station TOD is an excellent example of attractive transit-oriented design.
Image from Nelson\Nygaard

WHY TRANSIT-ORIENTED DESIGN MATTERS IN KAKA`AKO

Transit-oriented neighborhoods promote Honolulu's shared values of a healthy environment, social equity, economic strength, and neighborhood resiliency. TOD supports better transit service and also makes places more conducive to walking and cycling and in doing so provides a number of key benefits to communities:

INCREASED LIVABILITY

Transit-oriented neighborhoods are safe and enjoyable places to walk, cycle, and to spend time outdoors for people of all ages and abilities. The world's successful TOD districts have proven to be particularly livable and healthy places where walking and cycling are fun and easy.

HEALTHY ENVIRONMENT

Transit-oriented neighborhoods can help to reduce energy consumption and automobile use. With reduced fossil fuel consumption, transportation in transit-oriented communities leads to improved air quality and produces fewer greenhouse gas emissions. Careful design of streets and public spaces can reduce the volume of water runoff, lessening their impact on local watersheds.

SOCIAL EQUITY

Transit-oriented neighborhoods provide high quality transportation options for all community members, including those who can't drive a private car — a group that includes people with very low incomes, young people, and some seniors. Transit-oriented communities reduce the overall household cost of living by reducing the need to drive and thereby reducing household transportation costs. By incorporating the principles of universal design, transit-oriented neighborhoods are accessible to people of all abilities.

Transit is a travel option available to people of all ages and income levels.
Image from Nelson\Nygaard

ECONOMIC STRENGTH

Transit-oriented neighborhoods promote a strong regional economy by providing workers and shoppers with efficient access to places of employment, shopping and other activities. Shifting more travel to non-auto modes also reduces roadway congestion and improves goods movement, which can yield additional economic benefits. Finally, investment in walking, bicycling, and transit is often more cost-effective way of providing mobility and access than measures such as new parking facilities or new freeway or street lane miles. More compact and complete neighborhoods allow for more efficient use of existing infrastructure and scarce land—a particularly relevant issue on O`ahu.

Transit-oriented design contributes to economic development efforts
Image from Nelson\Nygaard

ENHANCED RESILIENCY

Transit-oriented neighborhoods can adapt to changing circumstances; they can achieve a desirable quality of life for their residents and workers even as the surrounding urban and natural environments evolve. For example, when neighborhoods apply the principles of universal design and provide transportation options for people of all abilities, they become resilient in the face of an aging population. When communities rely more on walking, cycling and transit, they can respond more flexibly to changes in energy prices.

The TOD Overlay Plan's objectives and policies are based on the "6 D's" of pedestrian focused, transit-oriented, community development:

D1: Destinations
Coordinate Land Use and Transportation

D2: Distance
Create a well-connected street network using Complete Streets Principles

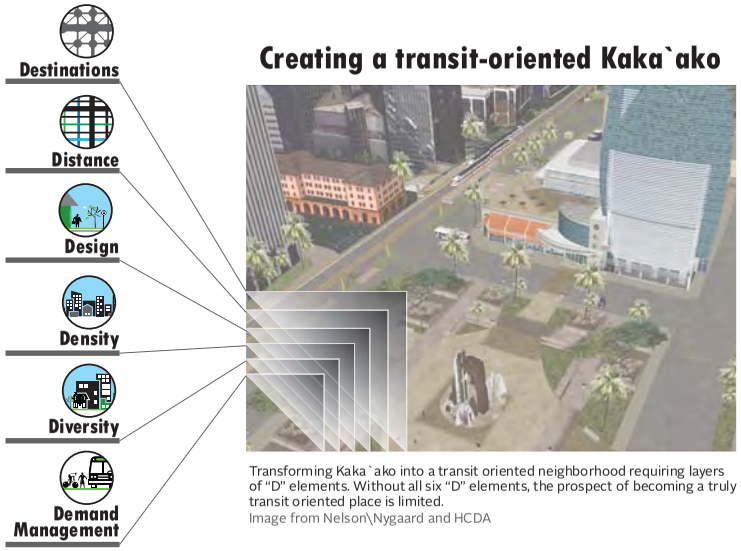
D3: Design
Create places for people

D4: Density
Concentrate and intensify activities near frequent transit

D5: Diversity
Encourage a mix of uses

D6: Demand Management
Encourage the "auto trip not taken" through a systems management approach

Figure 2-1 The 6 "Ds" of Transit-Oriented Neighborhood Design



Transforming Kaka`ako into a transit oriented neighborhood requiring layers of "D" elements. Without all six "D" elements, the prospect of becoming a truly transit oriented place is limited.
Image from Nelson\Nygaard and HCDA

Objective D1: Destinations
Coordinate land use and transportation

Coordinate transportation and land use by concentrating development along reasonably direct corridors, so that most destinations are 'on the way' to other destinations. When transportation and land use are well coordinated, transit, walking and biking can provide more people with fast, direct and cost-effective access to more destinations.

Policy D1.1 Locate highest density of uses near high-capacity, high-frequency transit, including high frequency bus and HART stations

Policy D1.2 Sustain the district's mixed use character and encourage a mix of land uses around transit stations, near transit corridors and transfer centers to spread demand throughout the day and create an interesting and dynamic pedestrian environment.

Policy D1.3 Create quality connections between the Kaka`ako district and neighboring districts to extend the viability of active transportation choices.

Objective D2: Distance
Create a well-connected street network using Complete Streets principles

Implement complete streets policies and develop a holistic transportation system in KCDD, finding ways to maximize the capacity to move people by developing environments that encourage people to walk, bike and take transit, rather than driving for all trips. A well-connected street network shortens travel distances, making it possible for people to walk or cycle to transit service quickly and conveniently from places they live, work, shop, and play and supporting walking and cycling as everyday transportation options. Implementation of the complete streets network will require coordination between work at street level and the need to consider upgrades to utilities to support new development.

Policy D2.1 Provide a fine-grained street network, minimizing the distances between intersections and avoiding streets that do not connect into the greater grid.

Policy D2.2 Create a multimodal mobility network, providing a continuous high quality environment that encourages active transportation and quality public spaces throughout the district.

Policy D2.3 Balance system uses by creating multimodal streets with priority for moving people rather than cars through design treatments that encourage walking, biking and taking transit.

Policy D2.4 Make walking and cycling access to frequent transit as direct as possible.

Policy D2.5 Complete streets implementation will be coordinated with the implementation of new utility infrastructure necessary to catalyze and support development.

Objective D3 : Design
Create places for people

Create streets and public spaces that are carefully designed with the needs of people in mind. The public realm should be safe, comfortable, and inviting for people of all abilities and ages. To achieve these objectives, transit-oriented neighborhoods have complete streets designed to meet the needs of a range of users, and they provide inviting public spaces that welcome lingering, gathering and celebration. Development in transit-oriented community development also reinforces the distinct history, culture, and character of Kaka`ako's neighborhoods using context-sensitive design and enhancing the pedestrian environment.

Policy D3.1 Design streets to relate to buildings in a way that creates porosity, interest, and public space opportunities

Policy D3.2 Design streets that are accessible and easily navigated by users of all abilities

Policy D3.3 Design parking and parking access to support a pedestrian-oriented realm

Policy D3.4 Design the spaces adjacent to HART stations and alignment through Kaka`ako in ways that maximize access and benefit to the community.

Policy D3.5 Design spaces that integrate the history, culture, and character of Kaka`ako.

TRANSIT ORIENTED DEVELOPMENT FOR ALL

"Many of the urban design features commonly associated with TODs have been linked to higher rates of walking and biking and lower probabilities of being overweight or obese. The construction of affordable housing near transit helps to ensure that these benefits are extended to lower-income households, which tend to be at higher-risk for many obesity-related diseases."

Center for TOD

Objective D4: Density
Concentrate and intensify activities near frequent transit

Encourage more intensive development near frequent transit (transit service that arrives every 15 minutes or better) to enable livable, walkable, and resilient neighborhoods. To function well, higher density development should be combined with the other principles of good transit-oriented development, creating a compact community with a connected street network, well-designed buildings and public spaces, a mix of land uses, and managed demand for private vehicle travel. In Kaka`ako, more intense land use will relieve development pressures on suburban and rural areas by attracting development to urban areas in the District that can be well served by a variety of modes.

Policy D4.1 Encourage mixed-use redevelopment along transit corridors.

Policy D4.2 Offset increased development heights with increased active public space amenities that directly benefit the building's residents and tenants.

Policy D4.3 Plan for density that supports community character and promotes a high quality of life.

Objective D5: Diversity
Encourage a Mix of Uses

Create an internally diverse and vibrant mixed-use community through the provision of a range of housing choices, services and facilities which improve the quality of life for residents and businesses.

Policy D5.1 Provide a mix of housing types at varying densities and costs.

Policy D5.2 Preserve and enhance active public space.

Policy D5.3 Include a broad mix of commercial and light industrial uses that are compatible with an urban village.

Objective D6: Demand Management
Encourage the "Auto Trip Not Taken" through a systems management approach

Develop a comprehensive systems approach to parking and travel demand management. This will include developing the Kaka`ako district in a way that allows residents of the district to meet many of their needs within the district, avoiding the need to travel longer distances for basic life needs. Combined with the emphasis on high quality, convenient, reliable and competitive transportation choices, these policies can have a wide range of positive benefits, including reducing traffic congestion and air pollution, making better use of existing capacity and infrastructure, increasing traffic safety, and improving public health.

Policy D6.1 Manage parking supply and demand consistent with the goals of reducing driving trips.

Policy D6.2 Create an environment within Kaka`ako that will enable residents to meet many of their needs within the district, reducing the need to drive outside of the district for all trips.

Policy D6.3 Ensure that all non-auto mobility choices are designed to be convenient and competitive with the auto to maximize non-auto travel.

DRAFT

3 LAND USE

DRAFT

3 LAND USE

Future Land Use: Creating Complete Connected Neighborhoods

Kaka`ako is located in Oahu's Primary Urban Center. This central area benefits from long-term investments in public infrastructure and proximity to employment centers, schools and entertainment. Investment in consolidating and improving the urban footprint in Kaka`ako also corresponds directly to the preservation of O`ahu's outlying rural areas and helps to reduce the cost burden for new roads, water and sewer lines. TOD Overlay land use policies build on the Mauka Area Plan and Rules (2011), Makai Area Plan (2005) and Makai Area Conceptual Master Plan (2010). Using these plans as a base, the TOD Overlay better integrates the HART transit system into the KCDD, by focusing on policies that advance access to daily needs and support shared quality of life concerns such as raising a family, getting to school, commuting to work, operating a business, and aging in place.

The Kaka`ako TOD Overlay anticipates more people in more types of buildings, resulting in a rich, varied urban fabric. Together, plan policies work to minimize spaces allocated for automobiles, while enhancing spaces for people. The result is a mixed-use, urban neighborhood with shaded - walkable streets and richly textured architecture. With this Plan, HCDA has an opportunity to create a "how-to" primer to leverage Kaka`ako's function as a major node in the regional transportation network by promoting positive collaboration and place-making.

"The best transportation choice is just being there" (Amory Lovins)

A common misconception exists that dense, busy cities result in endless congestion. However, countless studies have shown that typical suburban housing developments are often more congested than dense urban areas. In well-designed, higher-density, mixed-use neighborhoods with good pedestrian, cycling and transit access people tend to own fewer cars and ultimately drive 20-40 percent less annual miles than the same households would in more auto-dependent locations.[1] Scalable and synergistic, the transit-friendly land use principles represented in this plan's TOD objectives, work together to support the creation of positive feedback loops – encouraging neighborhood design that lets people find what they need close by, and provides opportunity to walk, bike or take transit to get there.[2]

The Kaka`ako TOD Overlay Plan land use strategies support this effort by bolstering the mixed use district as defined in the Mauka Area Plan. The TOD Overlay Zone increases both the variety and amount of residential housing and introduces new opportunities for area activities such as a limited number of hotels and office buildings. The increase in capacity is tethered to new community amenities and public realm enhancements, the substructure that supports urban lifestyles. Reinforcing strong land use and transit planning partnerships lays the groundwork to develop walkable neighborhoods (see Mobility & Access in Chapter 5), improve public health, lower vehicle miles traveled (VMT), and reduce GHG emissions, all while increasing sociability.

1 G.B. Arrington and Kimi Iboshi Sloop (2010), "New Transit Cooperative Research Program Research Confirms Transit-Oriented Developments Produce Fewer Auto Trips," ITE Journal (www.ite.org), Vol. 79, No. 6, June, pp. 26-29
2 Todd Litman (2011), "Land Use Impacts on Travel: Current State of Knowledge," Planetizen (http://www.planetizen.com/node/50451).

TOD Land Use Overlay: New Tool For Vibrant Neighborhoods

The TOD Plan will increase overall capacity within selected areas of the Mauka District (see Figure 3-1) to permit more people and businesses to locate in close proximity to the HART rapid transit system. The Overlay Plan boosts the intensity of uses over the "as of right" development in Mauka Chapter 217 rules (now 3.5 FAR not inclusive of structures associated with parking garages) using an opt-in, incentive zoning process. TOD Overlay development protocols leverage this growth to contribute to identified public benefits, while at the same time achieving a reasonable overall rate of return for the developer. This process will provide opportunities to:

- Reduce household costs associated with storing automobiles and driving
- Concentrate activities where there is the greatest level of accessibility
- Minimize land pressure on rural areas, and preserve Oahu natural resources
- Anticipate a variety of building types meeting the needs of a variety of income levels, at different life stages

Public benefits associated with TOD Overlay redevelopment are grouped into the following four categories:

1. Livability

On par with existing Mauka Area Rule requirements, under the TOD Overlay, 7% net sq. ft. of buildings must be allocated towards livability improvements for building tenants. This includes balconies, shared common areas, recreation rooms or gyms dedicated for the use of tenants.

2. Public Realm and Site Design

When living and working in urban environments, access to parks and the public realm is essential. A performance-based system ensures that both the site and building can respond to this need. Intra-block access lanes can serve as greenways, as conduits for pedestrians and cyclists, as well as include pocket parks and plazas for

WHAT IS INCENTIVE ZONING?

Incentive zoning is a land use regulation that encourages the creation of developer funded community amenities or building and land use designs that a community wishes to promote. Under an incentive zoning method, developers provide amenities (or payments allocated towards those amenities) in exchange for development rights often in the form of additional FAR (Floor Area Ratio).

More intensive use of property generates greater profits, a trade-off for providing the amenity sought by the community. Incentive zoning programs need to be carefully managed to ensure that the value of the community amenity is proportional and outweighs any adverse effects caused by additional building bulk.

WHO'S USING IT?

The Mauka Area Rules rely on incentive zoning to increase densities over 1.5 FAR. This program provides an extra .3 FAR for select uses (industrial uses, nursing facilities and assisted living).

The City of New York first created incentive zoning in 1961 to acquire available open space in densely packed commercial or business districts. Under this zoning, the city grants a floor area bonus by special permit for improving a subway station.

Development is allowed in San Diego's downtown is between 6 FAR and 10 FAR. Here, FAR incentives are used to preserve historic buildings, provide ground floor public uses, and cultural uses. FAR bonuses are also offered for green roofs, 3-bedroom units, employment uses, and affordable housing.

social interaction. Overlay Rules also include performance measures for usable green roofs and podiums, as well as vertical green walls, landscape planting within the right of way and sustainable storm water systems.

3. Set of Coordinated Park Improvements

The Overlay offers an option for land owners to dedicate in-lieu fees to identified parcels for public improvements (mauka or makai of Ala Moana Boulevard). This option is particularly critical for high value properties that can't be expected to accommodate the full amount of open active space on site. Options might include improving the "Lei of Green" promenade identified in the Makai Conceptual Master Plan, and/or the creation of a new 20,000 SF plaza associated with Civic Center HART Station. By coordinating district wide improvements, HCDA brings meaningful new public areas to the District in partnership with the private sector.

4. District-wide Access + Mobility

Greater densities require an array of mobility options. The Overlay will require internal streets for parking garage access, passageways for pedestrians to supplement street network, and transportation management strategies such as car share, bike storage, and transit pass programs.

Figure 3-1 TOD Overlay Area Eligible for Proposed Capacity Increases

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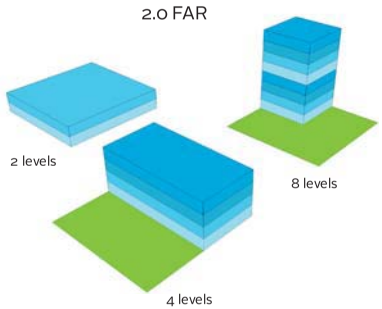
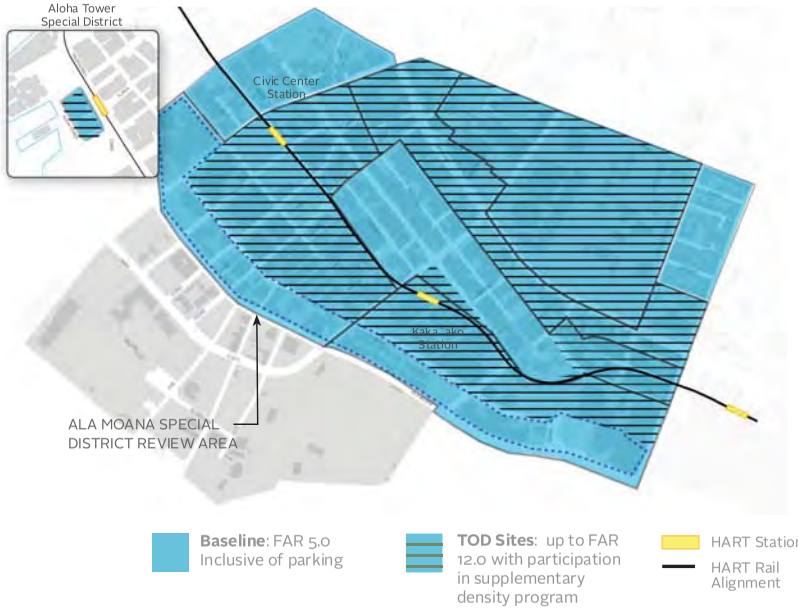
TOD Performance Based Controls

Today's cities are cleaner and safer relying on a variety of environmental controls. As such, planners can reduce an emphasis on controlling the impacts of specific types of uses, and focus more on improving overall urban quality. In this mixed-use district, capacity is controlled by using FAR (floor area ratio), a performance based measure that provides flexibility on how a building fits into a particular site. FAR controls that regulate overall gross floor area are supplemented by form-based rules that guide the size, siting and general treatment of buildings. In the TOD Plan and Mauka Rules (2011) these controls are found in the Regulating Plan - with details on allowable building types, regulations that provide for pedestrian orientation, and apply limitations on building bulk and massing and view preservation.



Floor Area Ratio Defined: The simple diagram above shows the application of 2.0 FAR across a site. Two stories covering the entire parcel of land, four stories on 50% of the parcel, or eight stories on 25% of the parcel.

Figure 3-2 Kaka`ako District Density



District Character: Encouraged Land Use Types

Strategy LU1 Diverse residential building types, ground-oriented family housing in proximity to transit stations

Providing access to more affordable housing is a priority for the TOD Overlay. Honolulu residents bear both high living and transportation costs. According to the City and County of Honolulu General Plan, which measures the Housing and Transportation Affordability Index, the average Honolulu resident spends 61% of his/her income on housing and transportation costs, (or 32% on housing and 29% on transportation respectively). However, in location efficient places such as Kaka`ako, these expenses can be significantly reduced. The Center for Transit Oriented Development finds an average reduction of 16% in transportation costs for households located in transit-rich neighborhoods. Additionally, providing for housing choices close to employment centers and in proximity to high capacity transit reduces commute times, and as a consequence, could potentially reduce the number of vehicles needed by a household.

The demographic character of the population living near transit also influences transportation demand. Different household types have differing travel behaviors. Studies show that as housing diversity increases, per-household transit trips also rise, and per-household car trips decrease.[1] In particular, lower-income households may not only own fewer vehicles but are also more susceptible to changes in gas prices and thus can be more transit-dependent.[2]

The TOD Plan introduces the opportunity for participating properties to increase overall capacity while reducing building volumes dedicated to storing automobiles. Allowing and promoting a mix of building types at higher overall intensities will provide variety – not only in the character and feel of a neighborhood, but also in the cost and feasibility of construction – influencing the end results for tenants, lessees, entrepreneurs and property owners, producing a mixed-income district.

Strategy LU2 Reserved housing

TOD Overlay Zone's additional capacity is estimated to be predominately residential, with a land use mix estimated at 85% residential and 15% commercial. As capacities increase in Kaka`ako, so does the potential for more reserved housing. All properties within Mauka Area are already required to meet the Kaka`ako Reserved Housing Rules. This requires that applicants for a multifamily development on a lot >20,000 SF must provide at least twenty percent of the residential floor area in the development for sale or rental to qualifying persons.

Strategy LU3 Transit-friendly land uses such as "third places," full-service grocery stores, cultural and community amenities

Kaka`ako is transitioning to become a full time, 24-hour neighborhood that can better compete in terms of desirability with residential locations outside the City's core. In order to retain and attract new residents, the neighborhood should focus on creating places for people, from small shops, to a full service grocery store, to cultural and community amenities, medical services, and day care. In particular, HCDA promotes land uses that encourage transit use throughout the day (peak period, mid day, nighttime, weekend) so as to encourage "round the clock" activity in and near transit stations.

Overlapping networks of uses are what make urban districts thrive. A limited number of hotels will be considered in up to three locations in proximity to the district transit stations. Hotels under consideration include full service, business, and condo-hotels for travelers seeking to stay outside of the tourist districts. A Kaka`ako-based hotel will be a transit -ride from the airport, and will be highly accessible for meetings and work engagements at the commercial core, or convention center.

1 Transit Cooperative Research Program Report 128. Sponsored by the FTA. Effects of TOD on Housing, Parking and Transit
2 CTOD (2009) Mixed Income Housing near Transit: Increasing Affordability with Location Efficiency

Action LU3.1 Prioritize capital spending for the placement of key community amenities within proximity to the station locations, including libraries, senior centers, and community centers.

Action LU3.2 Work with local developers and businesses to site a full service grocery store in Kaka`ako. The City's Primary Urban Center Plan points out that grocery stores require more floor area and service facilities than typical retail uses, warranting special incentives.

Action LU3.3 Explore impacts of hotel uses, and implement tools to ensure that Kaka`ako remains a district oriented with a local full-time residents rather than overwhelmed as a tourist destination.

Strategy LU4 Creative uses, including interim uses, pop-up restaurants & food trucks, and artist interventions

Often new business start-ups rely on access to cheap, flexible spaces that can be reconfigured and redesigned or leased temporarily to "test-out" new markets. Similarly, vacant or under-utilized land such as weekend parking lots can provide free or cheap space for local gatherings. Kaka`ako currently is host to "Eat the Street" the popular monthly gathering of local food trucks at the corner of South and Halekauwila. Other temporary use activities include street mural program and pop-up restaurants.

Action LU4.1 Draft a "road map" how-to guide for temporary uses, particularly for sites undergoing construction or long-term redevelopment - so that properties can evolve while remaining active.

Urban Fare, an urban grocery store in the Roundhouse Neighborhood is part of Vancouver's waterfront redevelopment serves as a "Third Place" for the surrounding community.

THIRD PLACES

"Third Places" - small neighborhood grocers, coffee shops, pubs or post offices that allow residents to mingle and have social interactions. Hallmarks of a true "third place:" free or inexpensive food and drink; highly accessible, within walking distance, involve locals – those who habitually congregate there; welcoming and comfortable; both new friends and old should be found there.

- Ray Oldenburg

Action LU4.2 Ensure that the code allows for co-working spaces, live work and other flexible uses.

Action LU4.3 Include artist space, and/or arts community spaces as part of an optional bonus amenity in the incentive zoning system for added density.

Strategy LU5 Adaptive re-use of character buildings

In addition to nationally registered historic properties in the Civic Center, Kaka`ako also contains a variety of buildings of interest that highlight the "old Hawaii" of early twentieth century architecture, from wood-framed plantation style retail to modernist civic buildings to aging WWII-era Quonset huts.

Character buildings should not be lost to redevelopment, but rather retained to provide context, and a sense of place in changing neighborhoods. Tools and incentives for both preservation and adaptive re-use of these building – particularly in Central Kaka`ako are needed. Here, the Mauka Rules existing density transfer programs could be expanded to provide incentives for property owners to preserve (and in many cases, restore) character buildings, providing new revenue that could be re-invested in the property.

SHARED USE AGREEMENTS

In the City of Arlington, VA the Arlington Arts Incubator and related City policies prioritize joint use agreements in various publicly owned locations that allow arts organizations to reuse spaces during "off hours." The Arlington Arts Incubator also invested in a set/costume workshop that acts as a shared resource and brings together the broader artistic community.

Citizen-led art at San Francisco PARKing day - Walkstop
Image from VIA Architecture

Mural Arts project Kaka`akoi
Image from VIA Architecture

Farmers Market
Image from VIA Architecture

Parking, Land Use, and Density Controls

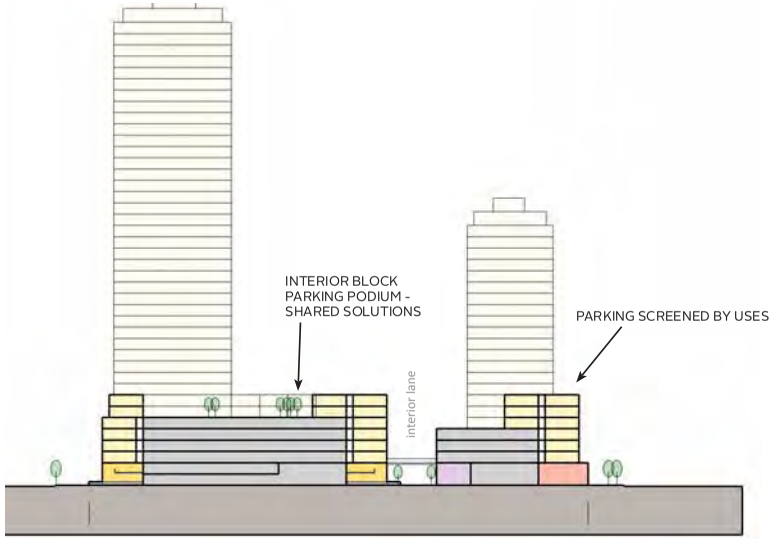
The treatment of off-street parking within a neighborhood has an impact on the quality of the public realm. Parking facility location and configuration (see Figure 3-3) influence not only building form and land use options, but also the ways in which future users will travel to or interact with the neighborhood. With the introduction of high capacity transit, and complete streets, Kaka`ako is transitioning to a "park once" location (see Chapter 8 for more information). These strategies encourage people who drive to the neighborhood to park only once, and walk to a variety of destinations. Flexible, context-sensitive parking strategies make better use of existing parking resources,

TOOLS: HISTORIC PRESERVATION

In Portland, density may be transferred within the neighborhood where the Historic landmark is located or to any site within two miles of the landmark. By allowing unused development potential to be transferred, redevelopment pressure on the landmark is lessened and a potential source of income is provided, as the owner may sell these rights to the owner or developer of the receiving site. Portland recently adopted zoning changes that extend this capability to "contributing" buildings in the Pearl District or those that are ranked on the City's Historic Resource Inventory.

Many cities also rely upon small grant programs dedicated to the restoration of qualifying buildings. A grant program could be designed to reimburse a small property owner a percent of the total cost of a façade renovation and construction up to a fixed dollar amount (such as $10,000.) Additionally, a Design Services Grant reimburses related facade design services up to dollar amount (such as $10,000).

Figure 3-3 Relationship of Parking Location and Building Form



as well as the design and treatment of parking structures in future buildings.

One strategy that is particularly important to ensure that parking demand and supply are in balance is to include volumes associated with parking into overall density controls. Under the Mauka and Makai Rules, building volumes associated with above-ground parking are not included in the maximum FAR calculation. Yet, it is understood that for each building to accommodate parking structures, one to two FAR are generally required (depending on the building's use). The TOD Plan shifts this strategy to recognize parking and its impacts as a land use.

Adaptive re-use project on Ala Moana Boulevard
Image from VIA Architecture

Sunshine scuba shop (Cooke and Queen)
Image from VIA Architecture

Strategy LU6 Off-street parking utilization: "Right Size" parking supply for both commercial and residential uses by including parking in FAR

The quality of urban experience is related directly to the minimization of the automobile's impact on streets and land uses. Building too much parking can have the following negative impacts:

- Dedicating excessive space to parking causing streetscapes to be overpowered by garages;
- Increasing the cost of new housing units, and negatively impacting the economic success of redevelopment projects;
- Influencing higher lease rates and artificially limiting new uses.

The Whole Ox (327 Keawe Street)
Image from VIA Architecture

However, building too few spaces can also result in frustration on the part of retailers, residents and neighbors when on-street spaces are in high demand.

As the form and character of Kaka`ako shift, ultimately motor vehicle ownership in transit station areas will decline, but this must be a carefully managed transition. Developers are incentivized to supply parking based on actual demand to maximize the efficiency of parking's use.

Strategies to aid in the transition include appropriately pricing parking, car sharing and parking management tools (See also Parking Strategies in Chapter 8).

Action LU6.1 Parking supply may be phased or accommodated in satellite locations in order to provide additional flexibility. Phasing structured parking and alternately leasing a portion of parking from nearby surface lots can add to, or improve overall project feasibility.

Action LU6.2 Reinforce the policy that all spaces are used efficiently and reduce the need for single use reserved spaces in order to promote a district wide, park once strategy.

Action LU6.3 Consider working with developers and financiers to further explore options for sharing the financing of a new parking structure.

Action LU6.4 Clearly communicate the per-unit cost of a parking space to consumers. "Unbundling" allows an optional purchase or temporary rental of a stall enables drivers to make a more rational assessment of parking costs.

TRIP NOT TAKEN

In the Bay Area, planners have learned that reducing parking requirements means providing adequately for other mobility options, such as car share, transit or cycling. The GreenTrip certification program started by the non-profit Transform in the Bay Area works to negotiate with municipalities for reductions in required off-street parking spaces for multi-family buildings when developers can provide the following set of strategies:

- Unbundling parking spaces
- The provision of long term transit passes
- Car share for residents

To qualify for the GreenTrip program, buildings must be located within close proximity to high frequency transit access.

The program monitors the transportation impacts of the participating buildings. The first five pilot projects provide the equivalent of 80,000 years of free transit passes and 24,000 years of Carshare for residents of Green trip buildings.*

* For more information see Transform, Oakland California Green Trip program, http://www.transformca.org/GreenTRIP

Achieving TOD: District Opportunities and Challenges

Although the project boundary consists of the entire HCDA Kaka`ako District, most of which is within either a 0.25 or 0.5 mile walking distance from a future HART rail station, not all areas of the district will experience significant land use changes under the TOD Overlay.

The TOD Overlay Plan consolidates growth in core area, while maintaining existing neighborhoods (i.e. a building currently limited to a low-rise will not become eligible for a high rise structure), public parks and major public assets to ensure continuity and longevity for users. As such, the TOD Overlay will have minimal impact on following Mauka Area locations:

- Sheridan, an existing low-scale, residential neighborhood;
- The majority of Central Kaka'ako identified as low rise industrial and service business areas;

- Civic Center, a neighborhood that contains major historic sites and civic structures with no immediate plans to redevelop; and
- Ala Moana Special District Review Area which maintains Mauka Area Rules limitations on heights and density (as noted on Figure 3-2).

Ala Moana Special District Review

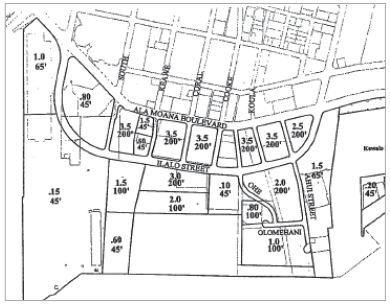
Encompassed by either the Kamehameha Schools or Ward Center Master Plans, the series of blocks mauka of Ala Moana Boulevard are subject to the following policy provision in the Mauka Rules: *"a negotiated number of taller, 400' towers are allowed, the remainder of the buildings are allowed to 100' height limits."*

Due to the desire to ensure views to the waterfront from properties Mauka, limitations on overall capacity increases are maintained in this area. However, these areas will be eligible to participate in parking reductions and district wide parking management plans as well as opportunities for new uses.

Kaka`ako Makai

In 2010, HCDA adopted the Kaka`ako Makai Conceptual Master Plan (KMCMP) as the neighborhood vision. While a broad mix of uses are currently allowed, the KMCMP designates a preference for commercial and civic-oriented uses and residential uses are excluded by statute.. Maximum heights allowed in this location vary between 45' on the waterfront, stepping up to 200' along Ala Moana Boulevard with an FAR of up to 3.5 not inclusive of parking.

The KMCMP, the Kewalo Basin planning process, and plans for public park enhancements showcase this area as a leading location to cluster community-oriented uses. Areas within Makai are eligible for associated parking reductions, provided they maintain existing density limitations.



Makai Height and Density Controls
Makai Area Plan (2005)

A table on the following two pages outlines the existing policy priorities and the specific opportunities and challenges to achieving TOD land use objectives for each neighborhood in the Kaka`ako District.

District	Existing Land Use Characteristics and Policy Priorities	Challenges and Opportunities for TOD Land Use Objectives
Aloha Tower Special District	This is a single property that is part of downtown Honolulu's waterfront neighborhood. Owned by the Hawaiian Electric Company, it is immediately adjacent to HART's proposed transit station.	The HECO substation occupies half of the Aloha Tower Special District site. Its location adjacent to the transit station makes it a prime candidate for transit oriented development to be coordinated with the downtown Honolulu waterfront and public realm enhancements.
Auahi	The vision for this area is as an urban, mixed-use location with a cluster of taller, predominately residential buildings. Its core is an emerging entertainment and retail center in the vicinity of Auahi and Kamakee Streets near HART's proposed Kaka`ako Station. Ward Street is a connection over Ala Moana Boulevard to Makai and the waterfront parks. Queen Street Park is also located in this district. Howard Hughes Corp. is a major landowner with an existing, entitled master plan.	Opportunities leveraging more intensive uses for increased community benefit in collaboration with a major property owner and the design of clear, friendly access to Kaka`ako Station. Flexible land use strategies should help developers to take advantage of mobility options and provide guidance for integrating transit directly into development plans.
Pauahi	Kamehameha Schools is principal landowner in this area. HART's Civic Center Station, Mother Waldron Park and the proposed 690 Pohukaina project are located in this district. Pauahi is envisioned as a high-rise, predominately residential area with some adaptive re-use of existing buildings. A priority on walkable active streets include Auahi Street as a retail street, and Cooke Street enhanced by a green linear park. This vision is also coordinated with Kamehameha Schools Master Plan, completed in 2010.	Challenges associated with the siting of the future elevated rail alignment and station include ensuring that infrastructure does not detract from the urban environment. Opportunities include developing a comfortable, public interface for the Civic Center station, coordinating public open space amenities, and improving streetscapes to support trips by transit, walking and cycling. Flexible land use strategies should help developers to take advantage of mobility opportunities and provide guidance for integrating transit directly into development plans.
Civic Center	The civic heart of Honolulu, this district contains historic buildings in a campus like setting. HART's Civic Center station is located adjacent to Civic Center, providing for enhanced access to the district.	Opportunities to ensure good connections into the major destinations and land uses in Civic Center. Existing zoning and development parameters will remain in place, and there is likely to be limited new redevelopment in this area.
Sheridan	This existing residential neighborhood consists of small lots with approximately 90 ownerships. The historic Makiki Church is located in this area and includes active historic uses on King Street. The Mauka Area Rules restricts density in this area to 2.0 FAR where infrastructure is lacking and building heights to between 45-65'. The neighborhood will be a blend of both older and new mid- to low rise residential uses	Due to limited development potential in this neighborhood, the TOD Overlay will have minimal influence. Challenges exist to improving the safety and convenience of walking into the Sheridan Neighborhood from nearby destinations and from the Kaka`ako transit station.
Thomas Square District	Across on the makai side from the historic Thomas Square park, Thomas Square District houses some of Honolulu's major cultural and educational institutions – the Honolulu Academy of Arts, the Neal S. Blaisdell Center and the McKinley High School. These constitute large ownerships by the City and County of Honolulu, as well as Hawaiian Electric Company. Thomas Square District is within a five- minute walk of both Kaka`ako and Civic Center station.	Several major publicly owned properties present opportunities for TOD redevelopment and possible public/ private partnerships, particularly the Blaisdell Center. In this area the TOD Plan can leverage the provision of new high rise mixed-use buildings to make needed improvements to the existing arena and performing arts facilities. The vision for this area includes coordinated and enhanced public spaces as well as connectivity improvements to establish better transportation access both through and into these large properties.

District	Existing Land Use Characteristics and Policy Priorities	Challenges and Opportunities for TOD Land Use Objectives
Kapolani	All of Kapolani is within a five minute walk of one of the HART stations. It is also a major bus corridor linking the downtown Honolulu, Ala Moana Center, and Waikiki. New high rise development along Kapolani includes a mix of retail, larger stores and showrooms and offices, with residential above.	Although much of Kapolani has already developed, there are several locations that may provide good opportunities for TOD, as well as contribute to an employment corridor with added height and density. These locations might support office towers, or residential developments, including a mix of high-rise or mid-rise apartment buildings.
Central Kaka`ako	Composed of smaller lots (less than 20,000 SF), this district contains about 200 small ownerships and is generally unimproved, lacking storm drains and other utilities. Services, employment, and light industrial uses predominate, including repair shops and craft production facilities. This area has limited redevelopment potential, with FAR capacity limited to 1.5 in the core area until infrastructure improvements are made.	Land use policy seeks to maintain and support existing local business, and to incubate the growing residential neighborhood, promote the siting of new services. Opportunities exist to promote flexible strategies for adaptive re-use. Some lots within Central Kaka`ako along Halekauwila may be eligible for TOD opportunities because of the HART rapid transit alignment.

TOD Overlay Development Opportunities

To understand the potential for growth with the TOD Overlay, for the purposes of the Plan HCDA conducted a systematic review of the area to identify those locations most likely to undergo redevelopment within the time frame of the Plan (2035) as well as meet the necessary criteria, such as lot size, to host a major project. This assessment focuses on:

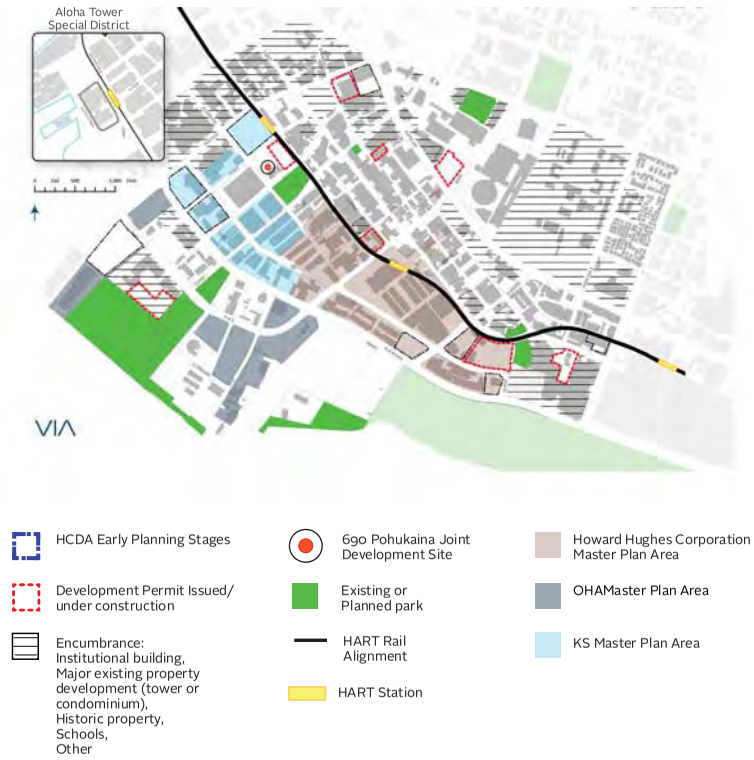
- Existing property ownership assembly, land tenure and development permits;
- Key policy priorities of the adopted Mauka and Makai Area Plans;
- Property impacts resulting from the three HART stations and alignment;
- Redevelopment potential as denoted by a "land-to-improvement value" ratio.

Sites thought to have potential to redevelop under the Overlay Plan have high land assembly potential, a low land to improvement value ratio, and an absence of major encumbrances. In some cases, properties impacted by the HART alignment will also have a greater potential to redevelop. This process provided the TOD Overlay Plan with a working framework to characterize future growth. However, it is important to note, infill redevelopment may ultimately take place at a variety of different scales, from full-block development to partial-block development, to small scale adaptive re-use projects.

Development Activity in the District

Current property development information in the Kaka'ako District is shown on Figure 3-3. To support and refine growth estimates, development permits, sites under construction, as well as sites in early

Figure 3-4 Kaka`ako District Development Activity



planning stages were considered.[1] These properties may have reduced likelihood to redevelop within TOD Overlay Plan Rules, due to existing private investment, phasing of permits and timing. The map also shows two existing master plans entitled under Mauka Rules (Chapter 22), as well as the location of the Office of Hawaiian Affairs land holdings in the Makai area.

Property Consolidation

Figure 3-4 shows the current assembly of property within the Kaka`ako district. There are several major property owners located within the Mauka and Makai District areas including the State of Hawaii, the Office of Hawaiian Affairs, Hawaiian Electric Company, Howard Hughes Corporation and Kamehameha Schools. Central Kaka'ako and the Sheridan neighborhoods are shown with limited property consolidation.

Acres	Major landowners in the Kaka`ako District
106.56	HCDA
55.71	State of Hawaii (DLNR + DOE)
53.66	Kamehameha Schools
58.8	Ward Center/ Howard Hughes Corporation
29.1	Office of Hawaiian Affairs
25.6	City and County of Honolulu
12	Hawaii Electric Company

In order to participate in TOD Overlay enabled height and density increases, a property must be large enough to support major projects (40,000 SF minimum) or constitute the assembly of one to three parties to achieve a potential development block. An assembled site must also accommodate the requirements for additional height and density such as, setbacks and spacing requirements, as well as parking, infrastructure improvements and access requirements.

Land to Improvement Value

Of particular relevance to this process is an understanding of the "redevelopment tipping point." This generally means that the value of a proposed development must exceed the value of the existing return on the property. In this instance, the comparison is between the "as of right" development within the adopted Mauka Rules 2011 combined with the Master Plans for Kamehameha Schools, and the Howard Hughes Corporation properties (both vested under the 2005 Mauka Area Rules (Chapter 22). It is important that there is enough added development incentive in the TOD Overlay that the property owners would undertake risk associated with redevelopment and re-invest in their property to achieve a greater intensity of use and greater returns along with providing public benefits such as enhanced public realm, parks and active spaces and increased street connectivity.

In the absence of a market study associated with this process, land to improvement value ratio can be used as a factor in estimating redevelopment potential. The ratio has been calculated using the 2012 Tax Assessor data from the City and County of Honolulu. Figure 3-5 shows the ratio of each parcel's assessed value of improvements to the assessed value of the land. Ratio values less than 0.5 are typically considered to score favorably for redevelopment, meaning the land was assessed at a value of at least twice as that of the improvements. Many recent real estate developments in Kaka'ako show a high land to improvement value ratio, indicating a relatively low likelihood for redevelopment within the time frame of the Plan.

1 Information on property development received 1-25-2013.

Figure 3-5 Property Consolidation

Figure 3-6 Land-to-Improvement Value

TOD Identified Sites

Sites identified in green are those that offer the best opportunities for redeveloping under the TOD Overlay Plan, with potential capacity increases.

In summary, these sites include consolidated properties (or may be consolidated with 1 or more owners), those that have a low improvement to land value ratio (a high redevelopment potential), are located within the eligible Mauka Area, and may be impacted by the HART rail Alapai and Ala Moana construction.

The remaining sites within the eligible area may also redevelop, but have less potential to meet all TOD requirements.

The selected sites identified in Figure 3-6 meet identified TOD Objectives: mobility and access, availability of services, and development potential.

Figure 3-7 TOD Selected Sites and Catalyst Properties

TOD Catalysts and Joint Partnerships

TOD identified sites are in public and/or private sector ownership. However, for those sites held by HCDA or its public partners offer especially good opportunities for pioneering projects. By providing both a vision for, and regulatory assistance to TOD redevelopment projects, HCDA can help create new project comparables that are distinct from the current market place offerings; simultaneously cultivating developers with expertise in high-quality mixed-use development, public realm and pedestrian design treatments, urban parking management, and transit-friendly access strategies.

The Kaka`ako District encompasses several larger sites that present opportunities for joint development partnerships. Sites are listed in the table below and mapped on Figure 3-6.

SITE	PROPERTY OWNER	DISCUSSION
1. Blaisdell Center	City and County of Honolulu	The Blaisdell Center currently contains a major arena and convention center with a 6,000 space parking garage. If redeveloped these uses could be consolidated in an dynamic center for the arts, with associated residential uses, and park space (see vision diagram on following page).
2. HECO Kaka`ako Site	HECO	One of the larger consolidated properties in the Mauka District, the HECO site is the location for company storage and staging. A partnership for TOD redevelopment would place significant housing opportunities in to this valuable, centralized location.
3. Aloha Tower Special District Site	HECO	Located on the waterfront downtown, and directly adjacent to a new HART station, this area provides an opportunity for both new uses and integrated development.
4. McKinley High School	State of Hawaii	In the interim, joint and shared use agreements are an option for community oriented activities on a more urban campus. The school site could be redeveloped as a 21st century school to serve a number of different purposes.
5. 690 Pohukaina Mixed-use Residential Project	HCDA Joint Development	In a public private partnership at 690 Pohukaina HCDA is working with a private developer (Forest City) to create up to 850 residential units near to the future HART Civic Center station including both market-rate and reserved housing. The development project will also incorporate potential improvements to Mother Waldron Park and fronting streets. Allowable land use may include 95,000 square feet of non-residential uses. Associated community benefits are being negotiated.

Blaisdell Center Opportunity

To take full advantage of this site, a new vision for Blaisdell encompasses the following features and attributes:

- Consolidated land uses to extend historic Thomas Square Park across King Street
- A completed street grid with improved vehicular connections through Blaisdell and a site design based on pedestrian access
- Options for a tall, iconic tower
- Opportunities for reserved housing
- A redesigned state of the art performance center
- Consider placement of a new business-oriented hotel to meet demand for visitors coming to Honolulu's Downtown for work purposes
- Include a multi-plex cinema
- Include sustainable site design, and green building techniques
- Provide a coordinated mobility and access strategy, with shared parking arrangements and ensure that people arrive at the site using all modes, including walking, cycling and transit.

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LA LIVE

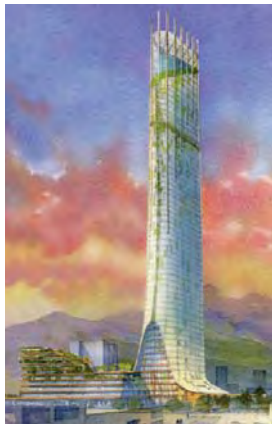
Downtown LA created this 54-story tower adjacent to the Staples Centers and the LA Convention Center. The project also mixes two hotels, JW Marriott and Ritz Carlton for a total of 1,000 rooms. The most exciting part of the LA Live concept is the dynamic public spaces, which include outdoor concerts, a restaurant row and cinemas, and even a Grammy museum.

690 Pohukaina
Joint Development Opportunity

In partnership with a private developer (Forest City), the 690 Pohukaina project will redevelop an existing surface parking lot on the `Ewa side of Mother Waldron Park with opportunities for new rental housing in the core of Kaka`ako. This new iconic building in the heart of the district, within close proximity to Civic Center station will provide a maximum of 804 residential units. Of these units, there are approximately 390 affordable units. The project also includes as much as 95,000 square feet of non-residential uses.

Livability and amenities include uses such as a community center/club house, natural drainage practices and a minimum LEED Silver accreditation. The developer will also take on improvements and programming for Mother Waldron Park including public art, green landscaped plazas, and a major pedestrian connection that links Mother Waldron Street to Keawe Street to the west.

Forest City is now working with HCDA on the development of a single tower program to maximize height and reduce visual impact.



Forest City Rendering of 690 Pohukaina Project Proposal
Image from Forest City

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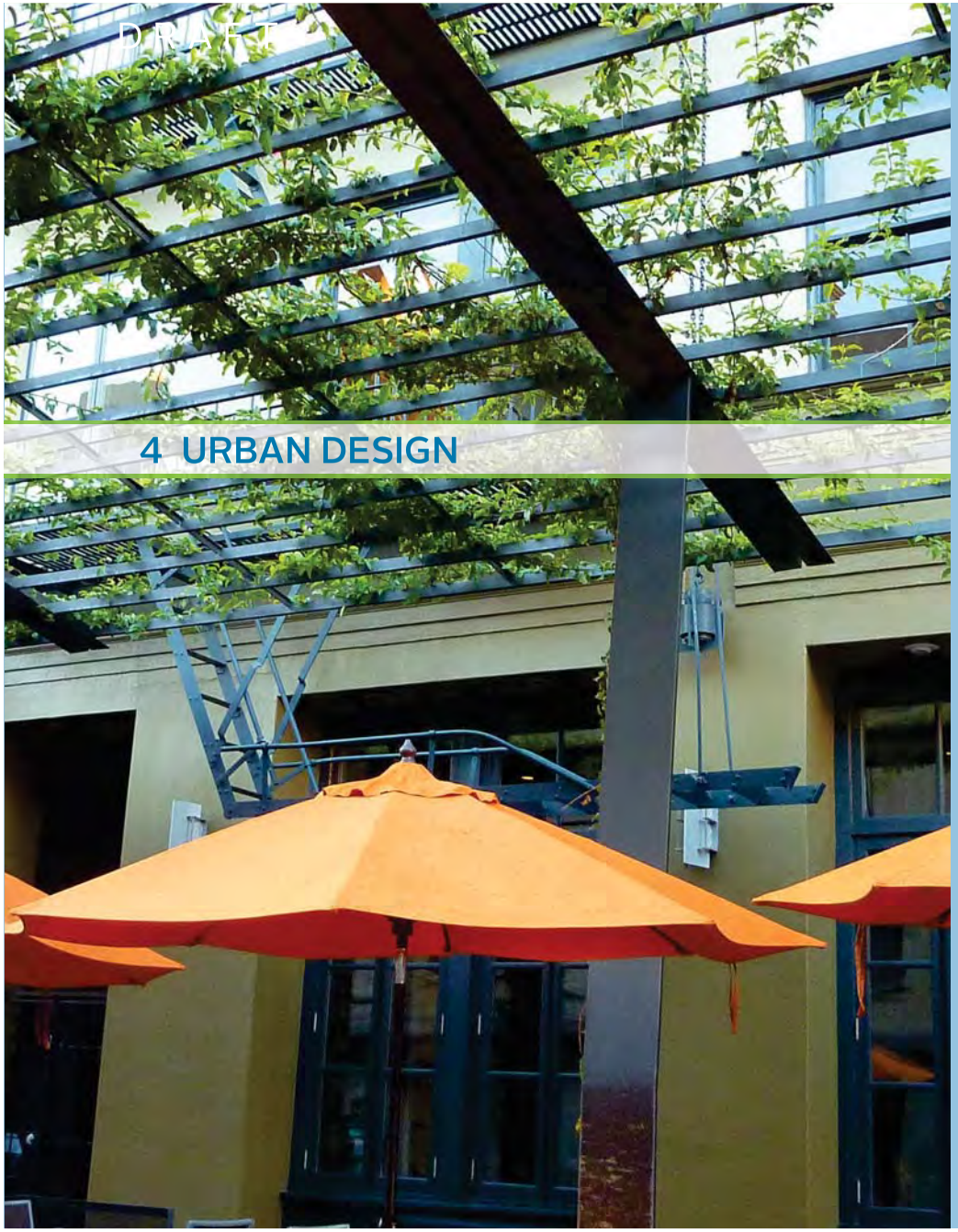

4 URBAN DESIGN

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4 URBAN DESIGN

Urban Design Framework

The Urban Design Framework for the Kaka`ako TOD Overlay Plan builds upon the vision established by the Mauka Area Plan to promote street-level activity, with safe, comfortable public spaces and a diverse array of uses. Urban Design strategies in this chapter clarify HCDA priorities for the relationships between people, the landscape, and the built environment. Particular to the achievement of the TOD Overlay Plan goals and objectives will be the selective introduction of additional height and density into this already urban location. This chapter designates a framework and a set of design principles that will guide the placement and design of new building forms, balancing additional capacity with elements that help to create a comfortable, livable urban location.

Development scenario of build-out under the TOD Overlay Plan. An array of taller, slender towers are envisioned near by the Civic Center, and Kaka`ako Transit Stations.
Image from VIA Architecture

Building Height, Tower Floorplates, and Skyline

The Island of O`ahu is known as "the Gathering Place," and Honolulu is its center of activity." Its skyline, set against a forested mountain backdrop and the curve of Mamala Bay, is unmatched by many of the world's metropolitan areas. Kaka`ako is located centrally between the downtown core and Waikiki, and is well positioned to accommodate taller buildings. Adding to Honolulu's skyline here will visually connect these two recognizable areas, while providing a skyline that will be seen by visitors and residents from vantage points across the south shore of O`ahu.

The careful placement and design of tall buildings can help to create a sense of place by framing and focusing views between the built and natural environments. Even now, there are limited views to either the Ko`olau ridge or the ocean from the heart of the district, however, vertical development strategies have the potential to cultivate new views for residents, employees and visitors while also aligning to street end vistas identified in the Mauka Area Rules Mauka-Makai View Corridor (see Figure 4-2).

The TOD Overlay Plan will utilize best practices in urban design to encourage exemplary buildings and advance the development of well-sited, tall, slender towers. Together, these buildings will create a skyline of framed peek-a-boo views through and between towers, as well as green spaces on podiums that will enhance views down from neighboring buildings and residential areas on the slopes of Punchbowl, Makiki and Pauoa. The sensitive application of height allowance paired with quality streetscape design can produce the characteristics of a comfortable pedestrian-oriented environment on the ground plane, while adding to the overall capacity in Honolulu's primary urban center.

Current Mauka area tall buildings consist of a preponderance of 200' long and 400' tall "slab" towers that tend to create a monotonous form and height. The TOD Overlay provides adjustments that help temper this form of development by encouraging both a diversity of high rise types, and a hierarchy of building form. Also, the new rules help establish better livability by concealing exposed parking garages and responding to the transit investment in the district.

The proposed set of High Rise Building Types aim to strike the right balance between constraints on building mass and volume, aesthetics and market feasibility. This is because smaller tower floor plates (below 11,000 SF) can become more luxury-oriented as the ratio between surface skin (the exterior facade) and interior is increased, bringing up the cost of the building envelope per interior salable square foot. Too heavy of an emphasis on narrow floor plates means that fewer towers will be built, and goals for making Kaka`ako a Hawai`i resident-focused, high-capacity neighborhood would not be achieved. This is why the TOD Overlay Plan includes more affordable building options, together with a tall floor plate option of a mid-range of 11,000 SF untethered from the previous lot size requirements found in the Mauka Rules (It is still required that all buildings must have a parcel at a minimum lot size of 40,000 SF to participate in the TOD Overlay height and density increases).

The TOD Overlay Plan also identifies a limited number of opportunities for the placement of iconic buildings (see Figure 4-1). These 700' towers will only be allowed with the provision of exceptional public benefits and with progressive green building practices and high architectural quality. Allowing these icons, HCDA is adding a sculptural element to the skyline, while condensing the building footprint. A variety of controls listed in the following table are explored, including tower floor plate maximums and spacing requirements, but perhaps the most important is the introduction of a design review program that can respond to the specific context and will begin to develop a culture of urban design quality in Kaka`ako.

Figure 4-1 Maximum Heights

Maximum allowable heights are established by High Rise Building Types, including limitations on bulk and massing. The base height in Mauka Area will be increased to 420' in areas illustrated on the map below. Towers of 550' are limited to development lot sizes of 90,000 SF or greater, with one tower allowed per development site. One iconic building with a maximum height of 700'is allowed in each of the Auahi, Pauahi and Thomas Square Neighborhoods.

- 420'/ 550'
- 400'
- 420'/550' / 700'

  700' Iconic Tower limited to one structure in Puahi, Auahi, and Thomas Square Neighborhoods.
- Maintain Existing Mauka / Makai Area Rules (maximum heights allocated by district, including the HECO Aloha Tower Site)

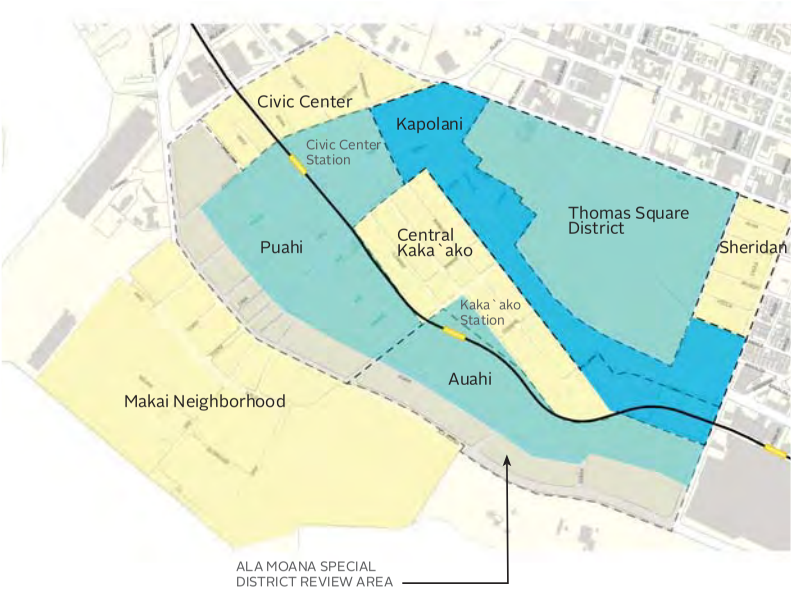


Figure 4-2 Building Siting and View Preservation

Control	Mauka Rule (2011)	TOD Overlay Recommendation
Mauka – Makai Corridor	Orient towers with long side of axis parallel to mauka-makai corridor. Min. 50' setback above 65' ft. Allows for 20% deviation from the view corridor per HCDA review.	Maintain the principle of short side axis orientation and test mauka-makai corridor in the EIS. Existing corridors may be altered or new corridors introduced. Any identified public views will be clearly defined and mitigating criteria established.
Solar Access	Not explicitly required	Provide guidance to ensure solar access for designated public spaces. Conduct a shade impact study to ensure that shadows from new buildings above 400' in height are minimized on identified parks and key pedestrian areas between 9AM and 3PM.
Tower Floorplate Controls	Towers maximum horizontal plan projection is 150' in one direction, with a maximum of 210' allowed between two farthest points of a tower floor plate. Specific floorplate controls are tied to block size.	High-rise Building Types (4-4) identified on page 4-15 are subject to identified tower floorplate controls. A minimum block size of 40,000 SF is required for all High Rise Building Types designated by the TOD Overlay Plan. Consider the exclusion of balconies from floorplate controls.
Tower Spacing	All towers maintain a spacing of 80'. When any portion of a proposed tower falls within the mauka-makai zone, a minimum of 300' separation between the long parallel sides of neighboring towers is required.	Maintain minimum 80' separation between all towers below 240' . Consider creating new spacing rules on taller tower typologies to allow more towers per block. Additionally, ensure significant separations between the Iconic Towers (with a maximum of three buildings in the Mauka District with heights ranging from 550' - 700').
Building Orientation	65% of one edge of a tower must be flush with a façade of the building or street element.	Add flexibility to street frontage setbacks. Encourage towers to be offset and horizontally staggered within a block. Include strategies to accommodate wind-down draft conditions. Consider guidelines for tower orientation associated with rear laneway and alley conditions.
Design Review	Not required Mauka (Makai only) For projects greater than 20,000 SF, as part of the Mauka Area Development Permit Process a discretionary Design Review committee reviews designs and provides comment within 30 days. Buildings in Makai are also subject to a set of guidelines produced in 2002.	Set thresholds for a design review process for taller buildings (over 240') to ensure quality of design. Principles should ensure that complimentary relationships between buildings are developed and that significant views are preserved. (see Strategy UD3)
Vertical Articulation + Tower Tops	Not required	Rely on design review as a tool to encourage articulation of building forms of taller buildings (>240'), reduction of the mass of upper portions and neighborly transitions in both height and scale between adjacent buildings.
Vertical Transitions	Not required	TOD Overlay provides performance based measures to produce harmonious combinations of varying heights within the same development block. Special rules apply to Iconic Towers.

Figure 4-3 Proposed Build-Out under TOD Overlay Plan

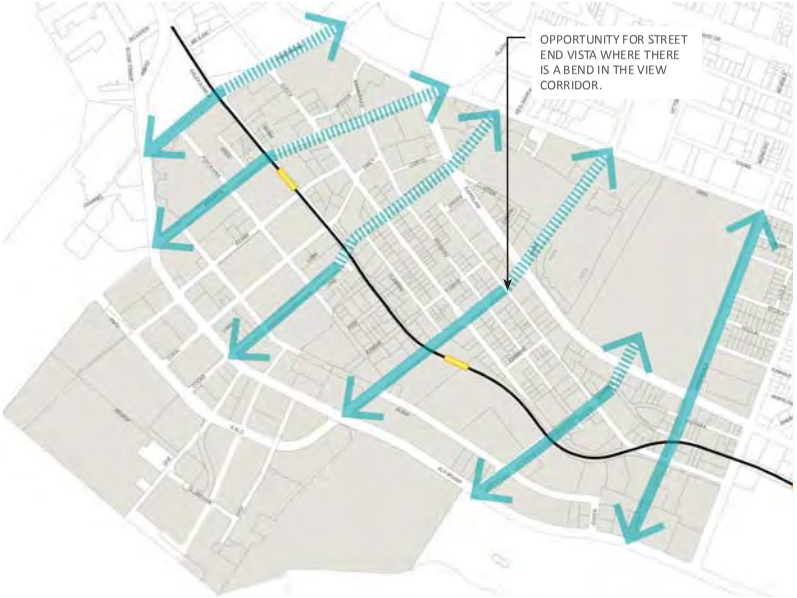
Figure 4-4 Mauka Area Rules Build-Out

MAUKA-MAKAI CORRIDORS

All structures, even those that are a single story have an impact on pedestrian views, obstructing sight lines to the ridgeline and the ocean. Establishing view corridors that maintain and frame future views is of critical importance. The Mauka-Makai corridor is defined in the PUC Plan and HCDA Mauka Area Rules (see Figure 4-2.). Buildings adjacent to a view corridor street must set all portions of the building above 65' back 50' (transitional height setback). Tower Elements are also required to be aligned parallel to the closest mauka-makai axis. Every development permitted under the Mauka (2011) Rules must submit a view impact study demonstrating that the ideal tower orientation was selected in order to maximize views.

The TOD Overlay Plan will also consider the treatment of streetend vistas on portions of view corridors that shift angles. As noted in Figure 4-2.

Figure 4-5 Designated Mauka Makai View Corridors and Streetend Vistas



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Strategy UD1 A high-rise neighborhood with a variety of development types

Design of the built environment is the result of development economics, regulatory design standards and site geometries within the context of complex market realities. To participate in the TOD Overlay High-rise building types, a development block must be at least 40,000 SF or greater. With a potential for increased capacities, the TOD Overlay Plan anticipates a redevelopment pattern that, depending on the size of the parcel, can accommodate multiple, inter-related buildings on a single development block. To avoid monolithic or overly uniform buildings and to encourage a skyline hierarchy that is both interesting and unique, larger-scale TOD developments with multiple tall buildings should be composed of at least two building types with significant height transitions between buildings (6-8 stories), as well as changes in architectural character, volumes and massing. An exploration and analysis of proposed Building Types is included on page 4-14 of this chapter. A prototypical block development is shown below (Figure 4-6).

Figure 4-6 Typological Block Development (120,000 SF consolidated lot)

1 MULTIPLE BUILDINGS MAY BE SITED ON A CONSOLIDATED PARCEL. DESIGN REVIEW ENSURES NEIGHBORLY RELATIONSHIPS BETWEEN TOWERS

2 INTERNAL PARKING STRUCTURES ARE EFFICIENT AND SHARED BETWEEN USES. PARKING PODIUMS CONTAIN ACTIVATED PUBLIC SPACE FOR BUILDING USERS

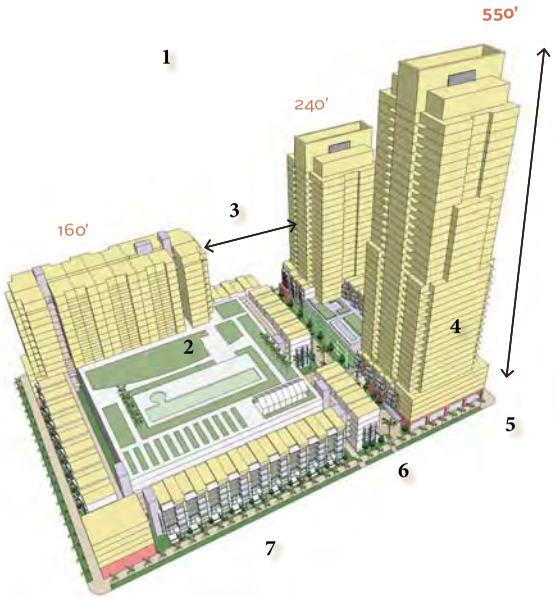
3 DISTANCES BETWEEN BUILDINGS ARE CONTROLLED FOR PRIVACY AND LIVABILITY AND CONSISTENCY WITH MAUKA-MAKAI VIEWS

4 BUILDINGS OF DIFFERENT HEIGHTS AND TENANCIES ANTICIPATE A VARIETY OF CONTEXTS AND CONDITIONS.

5 RETAIL IS PRIORITIZED IN CORNER LOCATIONS AND COMMERCIAL AREAS AND IS DESIGNED TO ENGAGE THE STREET AND ENHANCE THE PEDESTRIAN EXPERIENCE.

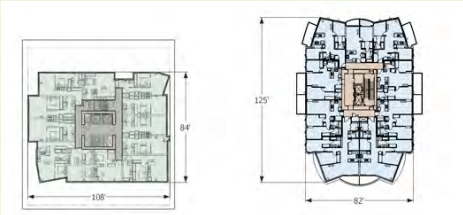
6 INTERNAL BLOCK CONNECTION FOR VEHICULAR AND PEDESTRIAN ACCESS ARE ACTIVATED WITH THE INCLUSION OF PEDESTRIAN FRIENDLY DESIGN, LANDSCAPING, AND ACTIVATING USES WHERE POSSIBLE

7 THE GROUND PLANE IS HUMAN SCALED. NON-COMMERCIAL STREETS ARE ACTIVATED WITH TOWNHOUSES, STOOPS, STREETSCAPE AND LANDSCAPING ENHANCEMENTS



BUILDING CODE CONSIDERATIONS

While the City of Vancouver is often cited as a precedent for smaller floor plate towers, these building types result from different building codes, in particular, a more consolidated core of both elevators and exit stairs made possible through the application of a "Scissor Stair." The scissor stair design is set of two intertwined stairs (like a double helix) located within one stairwell enclosure separated by a fire wall. Two adjacent flights connect the same floors in opposite direction, crossing each other like a scissor. In an enclosed scissor stairs it is possible for two people to climb or descend simultaneously without ever having to meet each other.



Typical IBC Tower Core
Alto - Seattle
8,000 SF Floorplate
12 units per floor
672 ave. unit (gross)
551 SF ave. unit (net)
1387 SF Core = 17%

Scissor Stair Innovation
Plaza 88 - Vancouver, BC
8,000 SF Floorplate
9 units per floor
666 ave. unit (gross)
670 ave. unit (net)
1072 SF Core = 13%

The scissor stair innovation provides for more leasable area to offset construction costs, while also allowing for a condensed footprint. Although scissor stairs are used throughout the eastern part of the US and in Vancouver, BC, building codes in the western US and Hawai`i treat them as a single exit for fire and life safety purposes, discouraging their use. Recently however, there has been increased interest in locally modifying building code for the scissor stair, beginning with Portland, Oregon where it has been used in the South Waterfront project.

One of the first projects to use the scissor stair is The Strand (shown below) located on the Willamette River. The scissor stair allowed developers to the reduce floorplates from 14,000SF to a "skinny" 10,000SF with each unit having a view.

The Strand, Portland

Vancouver Tower

Strategy UD2 Encourage climate responsive design

Current Mauka Rules require the base level of US Green Building Council's LEED Certification (or equivalency) on any new building in the Mauka District that increases existing floor area by 25%. With the TOD Overlay, HCDA should explore the incorporation of climate responsive design, sustainability performance measures and subsequent development incentives to encourage exemplary buildings. Green building practices may focus on the following:

- Windows and facade treatments for shading, daylighting and reducing heat gain
- Open air ventilation, and circulation including exterior corridors, stairways, internal gaps between podium liner uses and parking structures
- Arcades and breezeways and outdoor circulation at the street level, in courtyards and on ground floors that maximize access to the outdoors and takes advantage of the Hawaiian climate
- Provision of elegant and integrated shade structures on podiums, such as awnings and porticos and landscaping
- Orient tall buildings to manage the tradewinds through and around structures so that open space elements are comfortable
- Use of solar renewables, geothermal and wind energy, and district cooling opportunities
- Locally sourced and/or renewable materials, and diverting construction materials from the landfill

Outdoor Circulation and green roofs are a core elements in the sustainability guidelines for Vancouver's South East False Creek.

Portland's South Waterfront Ecodistrict, the City's newest high rise neighborhood with Platinum LEED buildings.

Strategy UD3 Provide for sunlight access

In the tropical yet temperate climate of the central Pacific, shading has both positive and negative qualities in the urban environment. Shade cools the streets, improves comfort of public spaces, and reduces heat island effect. However, access to filtered sunlight and skyviews are also positives, providing air circulation, breathing room and a sense of place. With the TOD Overlay's emphasis on taller buildings, guidelines to understand the impact and influence of shade should be considered. It is advisable that taller buildings (over 400') do not overly shade key pedestrian areas. Solar access can be included as a performance-based measure in the design and placement of tower footprints. The design of tall buildings should seek to reduce shading impact according to the following hierarchy of spaces:

- (i) active public spaces
- (ii) semi-private street edges or open spaces
- (iii) private open spaces

ACTIVE, GREEN PODIUMS

The potential to incorporate landscaped podiums and other green roof elements in Kaka`ako that will help to meet usable public open space requirements is enormous. In addition to providing open space, green roof systems also provide public benefits of absorbing rainfall, reducing storm water loads and with careful plant selection, adding to biodiversity and local wildlife habitat. A successful green roof requires technical expertise and the integration of a considerable number of building and site elements, early design decisions and trade-offs.

To encourage green roofs as a best practice within Kaka`ako, HCDA will consider a green roof policy and provide technical support appropriate to the Hawaiian climate, with resources and guides for developers. HCDA will consider appropriate incentive mechanisms as necessary.

The 55-story Washington Mutual Tower in Seattle has an ASLA Award winning public roof garden (by Philips Farevaag Smallenberg) located on 17th floor. Landscape design was developed to reinterpret a regional "sense of place" with windswept grasses, planting pathways and wood decking. Open to the public, this area also provides an outdoor social space for employees.
Image from Flickr user Rchapman

Strategy UD4 Introduce design review

HCDA has developed a design review process for projects located in both the Mauka and Makai Areas. This Plan expands the Design Review process to cover all projects that meet or exceed the following thresholds:

1. Residential or mixed-use building of 125,000 SF or greater and/or
2. Heights of greater than 240'.

A Design Review Board will be engaged to assist in the design and siting of the three Iconic Towers. The Design Review Board may provide a variety of perspectives on the built environment, such as an architectural professor, a developer, a local architect and a local artist or cultural representative, a landscape architect and a member of the community.

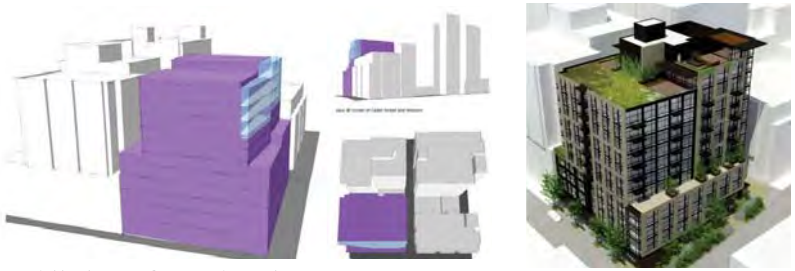


Image from VIA Architecture

Areas in blue do not conform to zoning envelope

EARLY DESIGN GUIDANCE BUILDING MASSING ALTERNATIVES → FINAL DETAILED DESIGN

Community Benefits for Design Review

- Reviews and analyzes proposed projects to provide early design guidance
- Provides a forum for public feedback
- Allows developers to respond to unique site conditions

Developer Benefits for Design Review

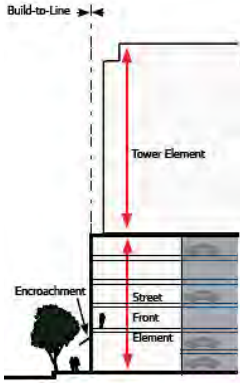
- Provides relief from prescriptive dimensional requirements such as setbacks and bulk
- Promotes community participation and acceptance of projects
- Encourages more flexible, creative and site specific design solutions

Action UD4.1 Implement a design review program for TOD Supplementary density buildings with guidelines that address site planning and massing, architectural building expression, streetscape, public amenities, and vehicular access/parking.

Action UD4.2 Establish design guideline principles and collect a set of precedent project images, diagrams and/or case studies showcasing of exemplary buildings and solutions for Kaka`ako.

Building Elements: Street, Middle and Tower

The Mauka Rules (2011) Regulating Plan establishes a set of Buildings Types ranging from low rise to high rise. These Building Types prescribe setbacks, building envelope and relationship to the street. The Plan includes a description of Street Elements, Mid-rise Elements and Tower Elements. The TOD Overlay is consistent with and builds upon this process.



Mauka Area Rules 1-12 A.

Guiding the Design of Street Elements for Tall buildings

The lower stories of buildings (the Street Element) have the greatest influence on the experience of walking and being in a place. Comfort in the urban realm is provided by the presence of strong edges along the walking path. Whether built form, walls, or terraced green, these elements create 'urban rooms' that reinforce and set the stage for complementary sociable activity in both the public and private realm. Attention to and design of the urban landscape provides the spatial structure that encourages pedestrians to choose to walk along the street.

The Mauka Rules defines a **Street Element** for all buildings as well as specific parameters for allowed building frontages, building placement and orientation and limitations on podium heights. The TOD Overlay maintains these basic guidelines while providing for flexibility in new building types. Generally:

While a walking path and landscaping are provided, a lack of building edge activation makes this location in Kaka`ako undefined and under utilized.

- Podiums of tall buildings align with adjacent building facades. Some strategic setbacks are encouraged, for example at building entrances, at plazas, courtyards or to create architectural interest.
- Characteristics of the podium should relate to the dimensions of the street. In smaller access lanes and internal block connectors, podium height should be reduced, generally no more than 1.5 times the street width is advised.
- Stoops and garden elements help taller residential buildings transition to the street, minimizing the impact of larger buildings above. In these instances, residential front doors should be made visible, whether used as a primary entrance or not. Townhouse frontages that can accommodate families should be encouraged for street level and on green, livable podiums.
- Floor-to-floor heights should be generous, particularly in commercial buildings, to ensure high quality adaptable spaces. Double-height first floors in all commercial buildings are preferred.

- Ground floor facades should maintain a high degree of permeability for both commercial and residential uses.
- Views between ground floor spaces and the street are particularly important to ensure the safety and security of pedestrians. Buildings should open up to the street and create the indoor-outdoor relationships present in plantation era Hawaiian architecture.

Figure 4-7 Street Elements

Control	Mauka Rules	TOD Overlay Recommendation
Building Siting **Regulating Plan Build-to Lines**	Regulating Plan controls building siting and placement by block; i.e. 75% of Street Element façade to be within 5-10' of the build-to line. This provision for property line setbacks requires private sector contributions to public realm improvements such as sidewalks.	Maintain as guideline, but allow deviations that respond to site geometries and context and public realm opportunities such as plazas and courtyards. Set clear characteristics in coordination with street types as defined in the TOD Overlay Plan.
Podium Height	The Mauka Plan generally maintains a maximum height of 65'. Setbacks are designated by building type. Mid-rise Building Types (i.e. Urban Block and Lei Buildings) require significant stepping back of upper storeys.	Alter setback requirements to accommodate additional capacity and allow flexibility to accommodate parking liners with top level uses. Align podium heights to coordinate with internal passages; i.e. podium heights are preferred to be not more than 150% to the street width.
First Floor Uses	Uses are mixed throughout Mauka. Retail uses are required on identified Promenade Streets.	Maintain, coordinate with new TOD Overlay Street Types. Ensure that first floor uses are not over-regulated, producing unmarketable spaces.
First Floor Height	Controls are differentiated by Frontage Types and by Use. Currently, the first floor minimum for retail on Thoroughfare Streets is 12'.	Enhance existing regulations. Generous first floors and high quality architectural treatments should be required for mixed-use and commercially focused TOD buildings with ground level retail. Double height first floors (16-22') should be considered for civic scale and flexibility of use.
Street Level Residential	The Stoop Frontage Type is defined and allowed according to neighborhood. However, the Terrace Frontage type is required for building frontages >100'.	Revise requirements to better encourage the Stoop Frontage type on High Rise buildings, and give livability/ amenity "credit" for setbacks associated with their stoops and semi-public gardens.
Parking Garage Screening / Blank Facades	Requires that the first three stories of parking garages are screened at a depth of 40'-80', with potential for dividing walls every 30'.	Parking must be accessed from an alley where feasible. Add flexibility to screening, consider a 75% screening requirement for all bounding streets, but allow deviations at midblock crossings. Unconcealed portions of garages should have enhanced landscape or other screening treatments.
Transparency	This is controlled according to retail use, i.e. 70% of a retail Thoroughfare Frontage Element to be transparent with views into storefronts.	Ensure that variances allow flexibility for mechanical spaces or where no alley is possible .

New Building Types

The TOD Plan introduces a new set of building types for this urban infill location. Building a comfortable, cosmopolitan, diverse Kaka`ako means that each new building should be context sensitive; is of an appropriate scale; respects adjacent public spaces, buildings and businesses and contributes to an improved pedestrian environment. In particular, with more density, matters of light, sky views and privacy must be resolved to ensure that one building does not negatively impact an adjacent site. In an urban environment, each side of the building is designed to reflect the character and context of its street.

1. High Rise Commercial/Office Buildings

South Lake Union Seattle:
Image from Graphite Design Group

2. Efficiency Residential Buildings

Colman Building, Seattle,
Image from Weber Thompson

3. Center Core

One Rincon Hill, San Francisco
Image from Flickr user dsleeter_2000

4. Point Tower

5th and Madison Tower, Seattle:
Image from Seattle Times

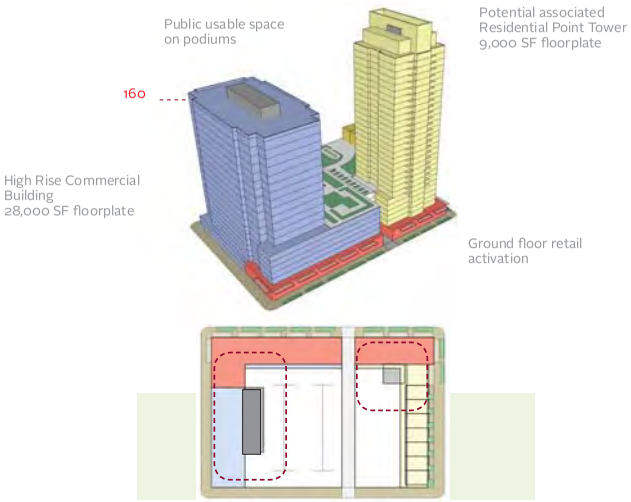
5. Iconic Tower

Shanhai Tower, Toronto
Image from Gensler

The following section is intended to guide a set of future implementing rules for high density development and outline building key heights and design attributes. This series of simple massing models examines the application of these types on prototypical lot sizes of 40,000 SF, 80,000 SF and 120,000 SF. The series of diagrams helps to illustrate potential build-out of each lot at a maximum of 12.0 FAR, assuming average unit sizes and parking requirements. Real world geometries and contexts would likely result in reduced FARs of 10-11.

High Rise Commercial/Office (Maximum Height: 160')

A limited number of commercial buildings provide highly desirable, efficient floor plates allowing a developer to accommodate one employer on fewer floors. Including office buildings in the TOD Overlay also ensures activity during the day and evening hours to support street level businesses. Limitations on total GFA of High Rise Employment Buildings in Kaka`ako allows for diversity of use in the district, without overly competing with downtown's commercial core. High Rise Employment buildings are desired within proximity to Civic Center Station, Kapolani Boulevard and on major arterials.



Design Criteria

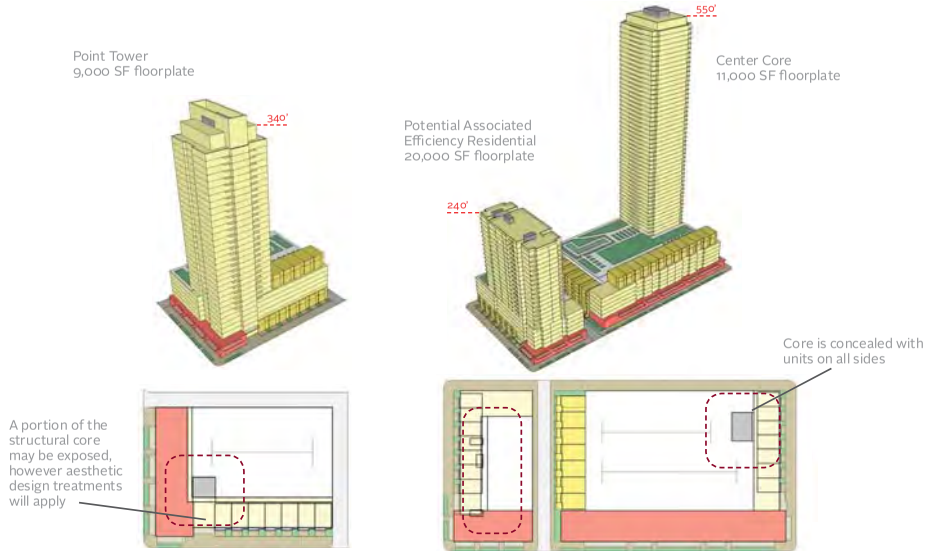
- Floorplate maximum size 28,000 SF
- Height limit: 160' or approximately 12 stories
- Height limits mitigate impact on the skyline
- Generous ceiling height at the first story

Livability Attributes

- Courtyards and indoor-outdoor spaces for employees
- Introduce passive ventilation for heating and cooling and daylighting of indoor spaces through courtyards or light wells
- Provide access to green roofs on podiums or to landscaped, street-level common areas
- Facilities for bicycles, participation in transit pass programs reduce impact on traffic and parking footprint
- Consider activated first floors that complement the commercial nature of the project and provide useful services for building users and guests.

Center Core/ Point Towers (Maximum Height: 420' - 550')

Center Core and Point Towers help ensure that a building is aesthetically pleasing when viewed from all sides. Center Core Towers house units with high quality façade treatments, concealing the concrete core at the center. Point Towers, while allowed to expose the core must incorporate aesthetic treatments such as glass or high quality skins. Both Building Types ...must have a smaller, must have a smaller, streamlined structure width aligned with the Mauka-Makai Axis. FAR controls balance between taller heights and building volumes on smaller parcels while providing for enough flexibility for multiple towers to be developed on larger lots. Tall heights ensure that revenue from salable area offsets the costs of high-rise construction while maximizing the use of Oahu's limited land area.



Design Criteria

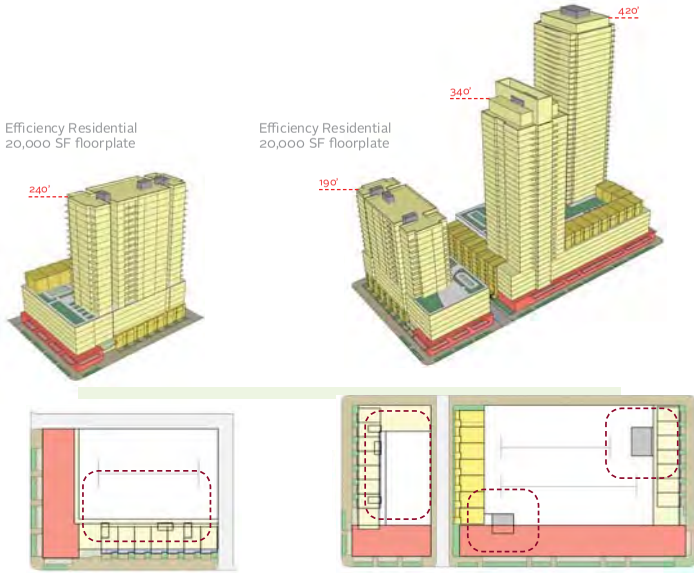
- **Center Core Tower**: 12,000 SF Floorplate Maximum/Structure width 120'/concealed core
- **Point Tower**: 9,000 SF Floorplate Maximum Structure width 100' unconcealed core or concealed core

Livability Attributes

- Design Review protocols for buildings over 240' should provide guidance and requirements for shaping buildings
- Encourage operable windows and balconies
- Podiums are landscaped and provide recreational amenities for tenants
- Relationship between buildings should ensure privacy and livability
- Podiums heights are coordinated to street types; 75' along Boulevards, Avenues, and other streets.

Efficiency Residential (Maximum Height: 240')

The Efficiency Residential building has a double-loaded corridor (apartments located on both sides of an interior hall) intended to provide for workforce and affordable market rate housing with a range of unit sizes. Whether on a single site, or combined with other towers, this building type allows developers to respond to many conditions. These buildings have an efficient envelope, address context and siting, and integrate with other taller buildings on a development lot.



40,000 SF Lot

120,000 SF Lot

Design Criteria

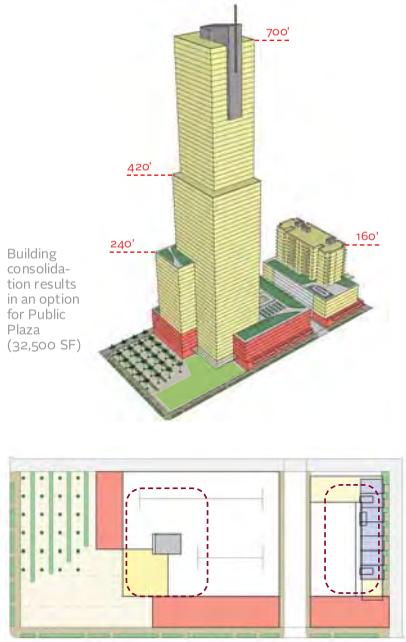
- Larger floorplates up to 20,000 SQ FT
- Height 240'
- Maximum length 250'
- Consider measures to reduce apparent bulk and mass from the street level

Livability Attributes

- More affordable construction type reduces overall unit cost
- Larger facade on podium, garden and streetscape enhancements creates opportunities for family-friendly units
- Shorter, more affordable buildings are an optional companion to luxury towers on the same block

Iconic towers (Maximum Height: 700')

The TOD Overlay introduces a limited number of very tall buildings, (up to three) within the District. These buildings are intended to provide for the possibility of iconic buildings that provide a change in scale to the Kaka`ako and Honolulu skyline. Treated as a special case, the Iconic towers will require a process for design review guidance and negotiations for exceptional public benefit. Design guidance should provide flexibility and sufficient allowance for the structural core of tall buildings (taller than 600'), while helping to ensure elegant proportions and iconic architecture. In particular it may be necessary to permit flexibility from design standards, such as the podium scale at the base of tall buildings to provide for place-based design solutions at the street level.



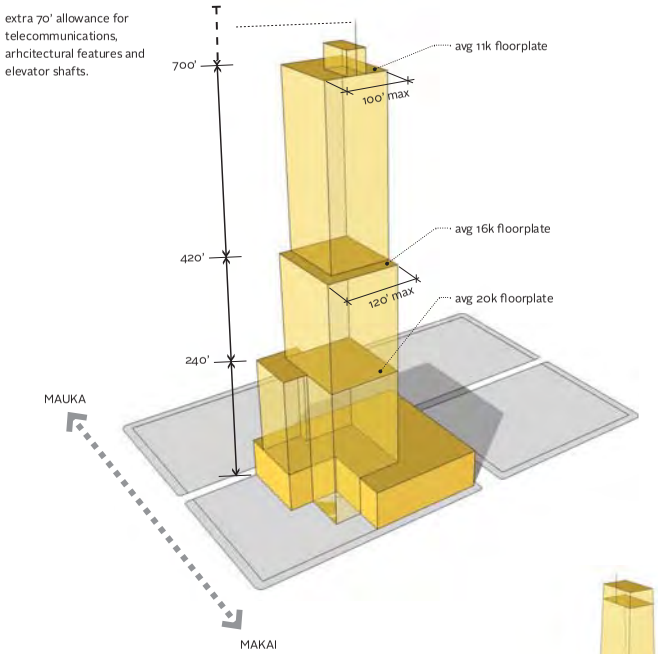
120,000 SF lot

Design Criteria

- Do not limit the floor plate or dimensions of the lower podiums for buildings taller than 550'.
- See diagrams on opposite page for details.

Livability Attributes

- Design ground floors and building bases to welcome the public, and include retail or other uses that welcome the public into the building base. (Should not feel exclusive.)
- All tall buildings > 550' should include publicly accessible retail or other uses on the ground floor as an extension of the sidewalk.
- Provide for public viewing areas on upper stories of very tall buildings (650' – 700') , such as a public observation deck, a lobby or restaurant for public use. (Viewing opportunities may be located on mid-levels not necessarily the top floor).



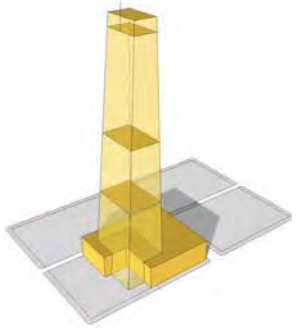


Diagram above shows an acceptable alternative tapering tower form.

Parks, Public Realm and Active Space

As Kaka`ako evolves, the provision of legible, accessible, and multi-functional public spaces is essential to neighborhood livability. New community-oriented public spaces will serve many functions. These are outdoor living rooms where social interaction creates a sense of belonging, provides variety in the built environment and respite from city life. Usable green spaces on podiums will be particularly important in this vertically-oriented district, not only for the use of building tenants, but also to preserve and enhance views from other tall buildings.

In high intensity areas such as Kaka`ako, each development may not be able to accommodate adequate public open space on site. In these instances, provisions should be made to allow developers to allocate in-lieu fees for public spaces off-site, and a plan for contributing to a series of coordinated green spaces within the District.

Public Parks

The City of Honolulu Department of Parks and Recreation's Standards and Design Precepts for Future Park Development (2004) provides recommendations and standards for various park types (e.g. two acres of neighborhood parkland per 1,000 residents). In the Kaka`ako District, HCDA will use this standard as a guide, but recognizes that many of the future park lands will be located makai of Ala Moana Boulevard. Kaka`ako Waterfront Park, and any future associated enhancements to the Kewalo Basin Area are within close walking distance for new Mauka residents. In the Mauka area, as associated with the TOD Overlay, assessments will be allocated to improvements for existing District parks and the provision of possible new public spaces, and other identified cultural amenities (see figure 4-8).

Additionally, both Kamehameha Schools and the Ward Neighborhood Master Plan will build new distinctive public open spaces as part of their master plan developments. Negotiated individually with HCDA, both of the Master Plans have applied Public Facilities credits (allocated at 3% commercial and 4% of residential GFA) towards local improvements. The Kamehameha Schools Master Plan has also proposed lands for a Gateway Park in the Makai area (Cooke and Ala Moana Boulevard) as a significant linear greenway as part of Cooke Street's beautification.

Figure 4-8 Public Open Spaces in KCDD

1. Green landscaped park associated with a Blaisdell redevelopment
2. HECO Site public open space option associated with redevelopment
3. Transit Plaza Associated With Civic Center Station
4. Kewalo Basin Area waterfront public space improvements
5. Kaka`ako Waterfront Park and planned extensions
6. Kolowalu Park (existing)
7. Mother Waldron Park (existing)
8. Gateway Park (existing)
9. Cooke Street beautification park to park connection (Proposed in KS Master Plan)
10. Public open space and linear park (Proposed in Ward Center Neighborhood Plan)

Public spaces associated with redevelopment

Major planned or existing public spaces

Public space improvements associated with major Master Plans

The Howard Hughes Corporation, Ward Neighborhood Master Plan includes designs for a new linear greenway and park ending with a street connection to Ala Moana Boulevard. Designs connect these Mauka area active spaces to the Ala Moana Regional Park.

In addition to the above, HCDA envisions two additional coordinated park spaces in the Mauka District that could be established with TOD Overlay associated redevelopment:

a) Additional Public Park on a redeveloped Blaisdell Center Site

- A primarily landscaped park designed to reflect and extend the existing Historic Thomas Square Park (across King Street). This opportunity would create an active public destination adjacent to cultural institutions, the Blaisdell Arena and Performing Arts Center, and create a significant central green space for the area.

b) Small Transit Plaza associated with Civic Center Station

- A small transit plaza (1/4 block) should be developed within one to two blocks of the Civic Center Station to act as a meeting point and destination (to be confirmed by HCDA).

c) Improvements to Mother Waldron Park

- Improvements to Mother Waldron Park are conceptualized as part of the 690 Pohukaina Project

d) Potential linear greenbelt under the transit guideway and pocket park on remnant transit parcels.

Figure 4-9 Conceptual Plans for Mother Waldron Park

Illustrative site plan of potential Mother Waldron Park programming and improvements associated with the 690 Pohukaina project.
Image from Forest City

Spaces for People

As noted, in Kaka`ako it is expected that a majority of new public usable open spaces will be built as part of redevelopment projects. These spaces will be found not only in civic-scaled public parks, but also in small pocket parks on streets (promenades), semi-public courtyards, publicly accessible interior spaces, public viewing plazas, and community gardens. These public spaces that are developed concurrently with individual sites may have full or partial public access (such as a grade-level or elevated courtyard, residential stoops or gardens) and may be either publicly or privately owned. In all instances, public spaces must be usable, neighborly, and provide for multiple functions where feasible.

General Guidelines

This section documents the types of public community spaces encouraged within the Kaka`ako District. New public community spaces should include the following attributes, for more information see Chapter 5 (to be coordinated).

- Provide signage identifying place
- Support sociability by including some or all of the following: moveable seating: tables, chairs, sit walls, shade structures, trees and a balanced blend of hardscape and softscape surfaces.
- Locate public spaces where they will be visible from adjacent units or occupied spaces to ensure safety.
- Locate bike racks at the perimeter of public spaces where feasible and appropriate.
- Water and electrical outlets should be provided to allow for more flexible uses.
- Include shade structures / trees to protect seating and activity areas where feasible. The spacing location and type of required trees may be modified when adjacent to a plaza or other identified community space.
- Manage 75% of stormwater on site in community spaces, through permeable pavers, bio-filtration units or other low impact

Small courtyard, Kaka`ako

Tamarind Square

development features that drain to planted areas.

- Use a blend of both hardscape and softscape features to provide a rich and varied texture.
- Consider any special user groups (such as seniors or children) when designing new community spaces.
- Consider design elements that will extend a community space's hours of use.

Public Plazas and Squares

Plazas are tucked between two- or three sides of building facades, while Squares are bounded by streets on all sides. This type of community space may consist of primarily hardscape elements such as pavers or concrete. Including changes in plane are encouraged to add variety and visual interest. Landscape materials and art can be used to both provide texture and make it attractive. A portion of a plaza can also be used for reserved seating for a cafe or restaurant. Permanent structures may also be included within the plaza provided they do not preclude access by the general public. Structures in plazas may be enclosed or open air or potentially leased for commercial use.

Features and attributes for a Public Plaza:

- A variety of seating opportunities including moveable and fixed seating/ Options such as sit walls, boulders and other multi-use objects are also appropriate,
- Design opportunities for special events or small scale gatherings,
- Mounted or suspended lighting, or decorative lit bollards
- Architectural feature that will provide a sense of place

Community Gardens

Community gardens provide valuable space for Kaka`ako dwellers to create urban agriculture. In addition to locations on the ground, parking podiums can also be actively used as rooftop gardens. In these instances, buildings should incorporate load bearing capacity sufficient to allow their intensive utilization including human

Director Park Plaza, Portland

Civic Center's existing public spaces are associated with City historic landmarks

occupancy, gardening and significant landscaping.

Features and attributes for a Community Garden:

- Sited with good sun exposure. Sheds or storage for tools
- Access to water such as hose bibs or rain barrels
- Adequate soil, planters and locations for garden plots
- Electricity
- Lighting over gardens, and pedestrian lamps in gathering areas
- Composting facilities, recycling and rubbish bins
- Rainwater catchment system
- Benches, seating, public art, community gathering or bar-be-que area

Small pedestrian resting area in South East False Creek, Vancouver

Promenades

Promenades are linear public spaces that enhance a circulation facility or internal block pedestrian connection. These areas are urban scaled environments that encourage social interaction and provide amenities for pedestrians including architectural features, water features or fountains, seating, landscaping, and hardscape. Promenades may incorporate low impact development features for water infiltration and detention. (See also Chapter 6 - Promenade - to be coordinated).

Features and attributes for Promenades:

- Pedestrian lighting
- Elements such as bollards, benches, seating or architectural features that provide separation
- Landscaping or planters
- Shade structures or trees
- Drinking fountains and water features
- Stormwater and rain garden enhancements

Planter boxes, community garden area

Packard Foundation in Los Altos, CA offices include a courtyard for socializing, and access to light and air. To reduce energy use, the building's offices are daylit with skylights and clerestories.
Image from Jeremy Bitterman, EHDD Architecture

Activity Areas

Activity grounds may be incorporated into other community spaces. These areas include children play areas, outdoor exercise equipment, active dog parks and runs, games such as bocce courts or chess sets. Natural creative play elements for free and unstructured play can also be included. Elements do not have to be designed overtly for play, but should support and encourage play by children, examples include water that can be manipulated, outdoor rooms made from rocks, landscape berms, or hills.

Features and attributes for Activity Grounds:

- Fixed benches facing play activity or game or equipment
- Drinking fountains
- Adequate lighting
- Measures necessary to protect children's safety from vehicular traffic such as low fences or landscaping to provide a physical barrier
- Places where pets can be outdoors and use spaces

Outdoor activities for families

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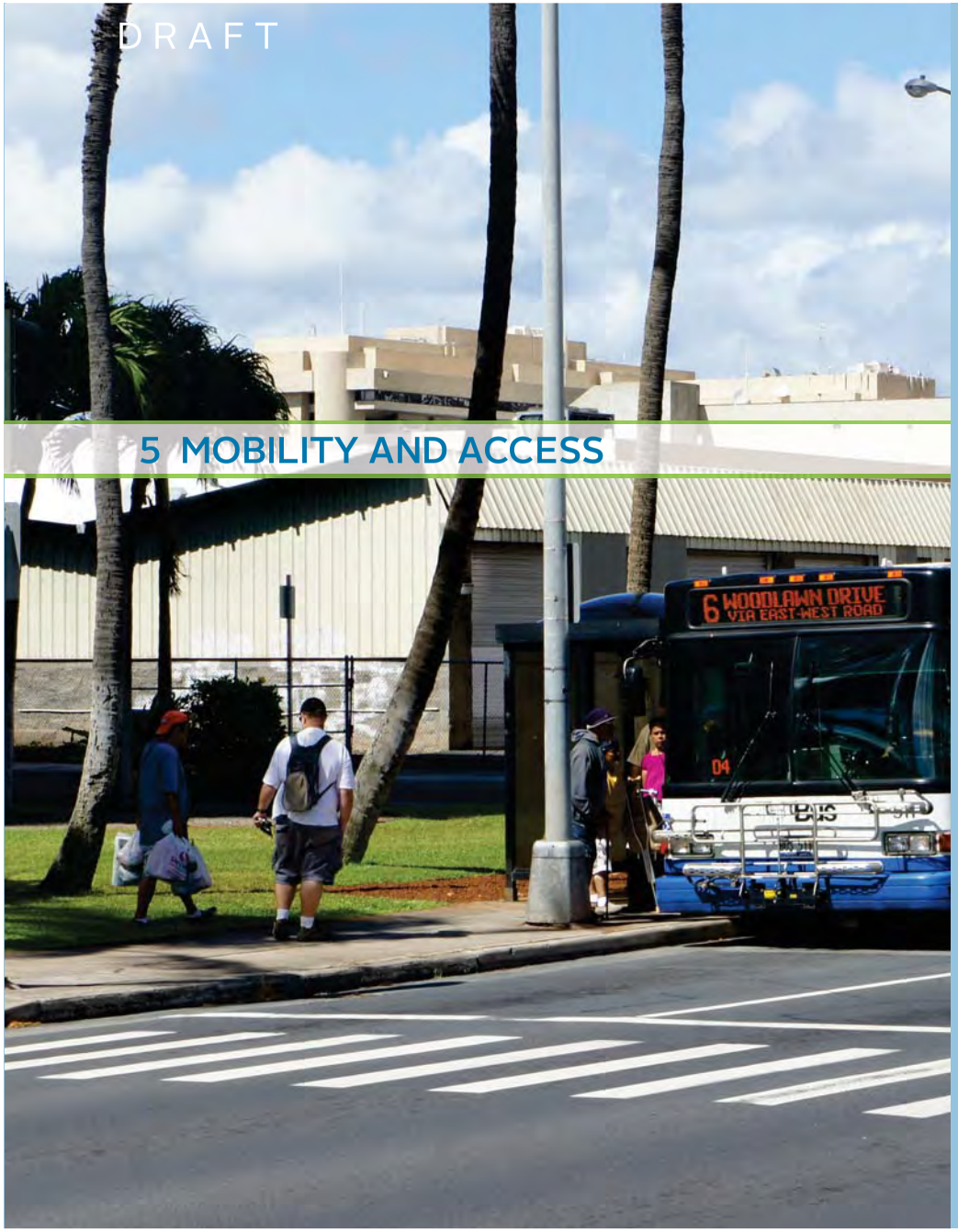
5 MOBILITY AND ACCESS



5 MOBILITY AND ACCESS

How Transportation Supports the KCDD Vision

A community's approach to providing transportation services and designing transportation infrastructure can have a tremendous affect on the quality of day-to-day life and how far a paycheck stretches. For the last 50 years, the single occupant automobile (SOV) has shaped community design and land use decisions. The result has been a diminution of community, cultural integration, and human health.

In other parts of Honolulu, such as Waikiki, the City and developers have made significant investments to create balanced, walkable urban streets.
Image from Nelson\Nygaard

Rising obesity and disease related to sedentary lifestyles, climate change, rising energy costs, and loss of time for family and cultural exchange have led many to look for alternatives to auto-oriented community design. A new paradigm is taking hold around the nation as people chose to live in vibrant urban communities where walking, biking, and transit are viable alternatives, active transportation is part of daily life, and the cost of fuel does not comprise 20% of household spending. Kaka`ako is in a prime location to benefit from these trends and create a holistic community where residents young and old can find a sense of communal space, vibrant civic life and cultural resources, and help to improve human and environmental health on the island.

The Kaka`ako TOD Overlay Plan takes a different approach to transportation. It assumes that mobility and access are not ends in themselves, but means for supporting these community outcomes. This portends future investments in complete streets prioritized to move people efficiently, safely, and comfortably

Walkable, Transit-Oriented Communities

While there are many types of walkable, transit-oriented communities around the world, they share a common characteristic: people can walk, bike, or take transit from their homes to accomplish many of their daily activities including getting to work or school, picking up groceries, or going out to a restaurant or a special event. Transitioning Kaka`ako to a walkable community will require well-coordinated public investment centered on transit stations and nodes.

Modal Priorities

Developing a diverse multimodal transportation network is the only way to achieve the community outcomes discussed above; it is a matter of geometry. To provide sufficient space for civic life, shopping, comfortable sidewalks, and vital commerce, spatially efficient modes of transport must be prioritized. Locating jobs, housing, and services within walkable distances reduces the need for short, inefficient auto trips. The six "D" principles outlined in Chapter 2 describe how land use and transportation integrate to create a walkable, transit-oriented Kaka`ako.

When HART rapid transit comes online, many more people will travel in and out of Kaka`ako each day without a car. Since almost every transit trip is preceded and followed by a walking or bicycling trip, emphasis should be placed on improving conditions for non-motorized mobility and access. The qual-

Great retail streets, like Robson Street in Downtown Vancouver, rely on transit to deliver people to the area and to reduce auto traffic making pedestrians safer and more comfortable.
Image from Nelson\Nygaard

Image from EverybodyWalk!

BENEFITS OF A TRANSIT-ORIENTED KCDD

In addition to accommodating growth, a transit-oriented KCDD is by definition "green" and provides an opportunity to create both a sustainable Honolulu and a healthier planet. A walkable, transit-oriented KCDD will deliver:

Lower Overall Household Costs. Cars are expensive; household costs decrease when people are less dependent on them. In addition to increasing affordability, social equity improves when all citizens have good access to jobs, schools, healthy food, and other critical services. In efficiently designed urban neighborhoods with a range of quality access and mobility options, owning a car can be an option, not a requirement.

Improve Public Health. Residents of transit-oriented communities walk and bike more than their suburban counterparts, in part because everything is accessible. Recent research shows that people who walk and bike are frequently healthier than those who live in auto-dependent neighborhoods.

Support Diversity. Walkable, transit-oriented communities can support existing communities and businesses by reducing sprawl and keeping cultural assets accessible within a compact area.

Increase Safety. Over the past two decades, the U.S. has averaged approximately 2.5 million people injured on its roadways every year and motor vehicle crashes are the leading cause of teen deaths. Designing streets for pedestrians first makes our communities safer for people of all ages and abilities.

Enhance Local Business Districts. Compact communities with more businesses and residents create vibrant neighborhoods. Business districts thrive as more retail space is available and the people who live nearby evolve into a dependable customer base; residents have a reduced need to leave their communities in order to shop, eat, or play. HCDA will integrate existing light industrial and service businesses into the district.

Reduce Carbon Footprint. Per capita greenhouse gas emissions decrease when people are less dependent on cars. Households within transit-oriented communities also consume less energy per capita than households in auto-dependent communities.

Preserve Regional Open Space and Natural Resource Lands. Compact urban neighborhoods allow farms, forests, and coastline to be spared the intense pressure of development and be preserved for future generations. Reduced sprawl improves the health of the entire region.

Today, there are an increasing number of Honolulu residents who agree with Lewis Mumford's famous statement about cities: "forget the damned motor car and build the cities for lovers and friends." However, if the City and the region continue to accommodate the automobile as they do today, our streets will move fewer people over time, as buses are further slowed to a crawl by congestion and walking and bicycling become less attractive. The result would be a continued downward spiral with a degraded quality of life for everyone and a more vulnerable local economy with fewer economic opportunities.

ity of pedestrian and bicycle access to transit is largely dependent on factors controlled in the public street right-of-way. This plan recommends a policy hierarchy to guide transportation and prioritize transit access investments as the KCDD is redeveloped.

Figure 5-1 illustrates the modal priority that permeates the Kaka`ako TOD Overlay Plan transportation approach and direction on Complete Street design and development. HCDA and City/County investments in Kaka`ako streets should be based on the modal priorities represented in this graphic.

Complete Streets / Safe Streets

Moving forward, HCDA will plan a transportation system that is balanced, safe, efficient and equitable for all users. Of equal importance, the system must support the new development planned for the district and the vital civic life that will emerge with it. To do this, HCDA and its partners must adopt new principles for street design.

> *The safety and convenience of all users of the transportation system including pedestrians, bicyclists, transit users, freight, and motor vehicle drivers shall be accommodated and balanced in all types of transportation and development projects and through all phases of a project so that even the most vulnerable – children, elderly, and persons with disabilities – can travel safely within the public right-of-way.*

Chapter 6 describes in more detail principles, an approach and street types that will deliver on this vision.

Complete Streets Legislation

The State of Hawaii's Complete Streets policy, Act 054, states that, "The department of transportation and the county transportation departments shall adopt a complete streets policy that seeks to reasonably accommodate convenient access and mobility for all users of the public highways—including pedestrians,

Figure 5-1 Modal Hierarchy

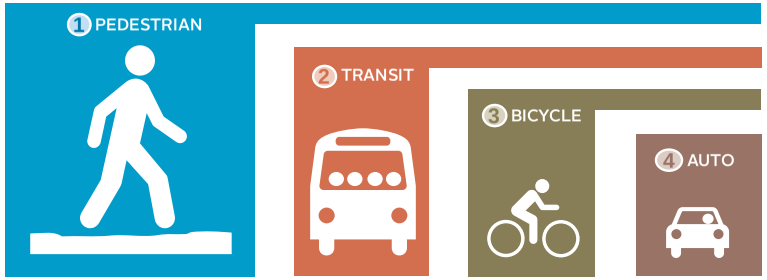
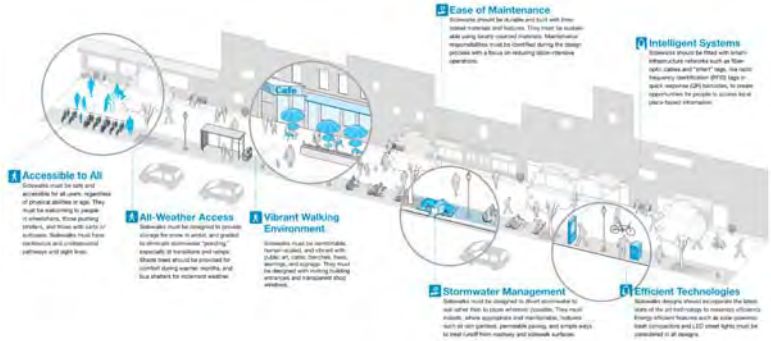


Figure 5-2 Pedestrian Elements of a Complete Street



bicyclists, transit users, motorists, and persons of all ages and abilities." This current legislation and the recently approved City and County Bill 26 warrant the design of complete streets in Kaka`ako and will ultimately assist in creating a balanced transportation system as prescribed in the PUC plan so that "streets are engineered to accommodate automobiles along with transit vehicles, bicycles and pedestrians."

Current Transportation Systems and Use

The KCDD is positioned in the heart of urban Honolulu between the Downtown and Ala Moana Center; Waikiki lies just to the east. The district is flat with generally well connected grid of streets. There are three major Ewa-Diamond Head traffic corridors to the makai side of the H1 freeway; the Beretania/King couplet lies on the mauka side of the district, Kapiolani Boulevard runs through the district, and Ala Moana Boulevard, which is a State highway, bisects the district creating the HCDA mauka- and makai-side district designations.

Transportation and access in Kaka`ako is oriented toward automobile travel; however, there is excellent bus transit service operating through and on the outskirts of the district. The Hotel Street Transit Mall, the Alapai Transit Center, and the Punchbowl, King, and Ala Moana transit stops which is served by 13 bus routes, are among the busiest transit boarding locations in Honolulu. Other bus routes operate through the district on Queen Street, South Street, Ala Moana Boulevard, and Ward Avenue.

Walking is more prevalent at the western edge of the district given the proximity to Downtown. Protected bicycle access to the KCDD is limited, with the exception of the multiuse trail that runs on the makai side of Ala Moana Boulevard east of Ala Moana Park Drive.

Viewed through the lens of accessibility, no place in urban Honolulu is better positioned to accommodate dense urban growth while simultaneously enhancing the environmental, cultural, and civic offerings of the City.

Streets in Kaka`ako should not be one-dimensional. Streets should offer multiple user benefits and help to achieve TOD Plan goals.
Image from Nelson\Nygaard

TRANSPORTATION PRINCIPLES

The 10 principles listed below guide the mobility, access, parking, and transit access elements of the KCDD TOD Overlay Plan.

1. Measurement

Transportation is Not an End in Itself. Transportation is a set of investments to help us achieve KCDD community goals, and we should regularly measure how well the transportation system is meeting these goals.

2. Management

Transportation is a Limited Resource. Transportation and parking capacity are valuable assets that must be managed as a limited, renewable resource. We cannot build our way out of congestion. Instead, transportation and parking must be managed like water supplies: by implementing incentives to reduce demand, as well as increase supply, with a focus on the right level of availability at all times.

3. Street Design

Street Design Follows from Place and Function. Streets are designed and managed to support the places and neighborhoods they serve and to balance the needs of everyone who travels along them. While streets serve to accommodate movement, their design should follow first from what kind of place is being created alongside them.

4. Quality

Effective Transportation is More Than "How Far" or "How Fast." KCDD transportation choices are key to creating a high quality of life and a vital business environment, and these choices should be enjoyable for everyone who uses them and should reflect the different needs and desires of Honolulu's diverse population and visitors.

5. Public Space

Streets are Open Space. Streets are a primary component of Honolulu's open space and recreational system. The transportation system supports a vibrant social life. Streets are the largest publicly-owned land use and the biggest component of the City's open space network. In addition to their function as transportation facilities, sidewalks and streets also facilitate socialization and recreation on a neighborhood, community, and regional scale.

6. Energy

Transportation is the Solution to Energy Reduction. Heavily reliant on fossil fuels for its energy supply, Honolulu is looking to reduce its reliance on imported fuels. By focusing new development near transit, investing in TDM and ensuring local services are available within walking distance, KCDD and urban Honolulu can further reduce its impacts on the planet.

7. Public Health

Active Lives Benefit Everyone. Public health experts recognize that the best way for people to get regular exercise is to incorporate physical activity into their daily routines. Increasing the number of people who can safely travel by "active" transportation modes like walking and bicycling can significantly improve public health outcomes for KCDD and Honolulu residents. The health benefits of walking are especially important for seniors and children.

8. Affordability

Integration of Housing and Transportation Planning Creates New Opportunities. Reducing household transportation costs can make housing more affordable for everyone—especially by allowing families to eliminate a car by providing attractive alternatives to driving and more housing choices near transit.

9. Economy

Efficient Transportation Supports a Strong Economy. A healthy economy requires an efficient, balanced transportation system that optimizes the movement of people and goods. The transportation system must support KCDD's burgeoning entertainment scene while supporting the base of existing industrial businesses and commercial districts. A key transportation outcome is to place KCDD residents and employees within walking distance of their daily needs.

10. Safety

Safe Movement for Everyone, Everywhere, is Fundamental. The transportation system must be safe for all users at all times of day, regardless of age or ability, so that both *kupuna* and *keiki* feel safe crossing any street. The network also must accommodate the City's emergency response system.

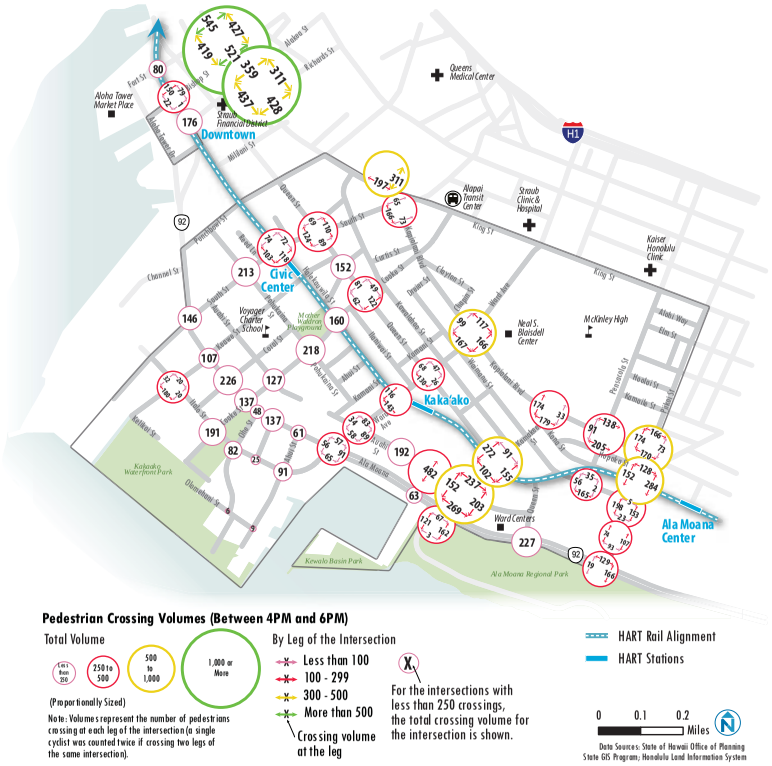
Mobility and Access in Kaka`ako Today

Pedestrian

Pedestrian traffic is low in much of the district, particularly compared to Downtown or Waikiki; many more people travel on foot on the western edge of the district adjacent to downtown and the government office areas. The highest level of pedestrian activity occurs near major transit stops (i.e., on Ward and Kapiloani) and in areas where there are higher concentrations of retail and services.

Figure 5-3 illustrates the level of pedestrian activity at more than 40 major intersections around the district during the afternoon peak period.

Figure 5-3 Pedestrian Volumes in the KCDD (2013 PM Peak Hours)



Transit

Figure 5-4 illustrates the current bus transit network operating in the KCDD as well as the proposed HART alignment and stations. Actual average daily levels of passenger boarding by stop are indicated by the scaled circles; HART ridership is average daily for the projected year of opening. The map indicates that while Ala Moana Boulevard is an important transit street, the majority of bus transit boardings occur along the northern edge of the district, particularly along King and Kapiolani. The largest boarding locations are at Punchbowl and King and at the Alapai Transit Center.

EXISTING PUBLIC TRANSPORTATION

Kaka`ako and the Greater Honolulu Area is interconnected with one of America's best transit systems. Ridership for The Bus has grown from 30 million passengers per year to approximately 71 million. It ranks in the top twenty for the most utilized transit systems in the nation.

Figure 5-4 Transit Service and Average Daily Boardings in the KCDD (2013)

PROPOSED HART STATIONS IN KAKA`AKO

The Honolulu Authority for Rapid Transportation (HART) is in the process of constructing a fixed guideway rail system that stretches from East Kapolei to Ala Moana Center. The three transit stations adjacent to the end of the line (Ala Moana Center station) lie within HCDA development jurisdiction and influence the development of this TOD Overlay.

#18 Downtown Station *(at the Aloha Tower Special District).* This planned HART station is located next to the Aloha Tower Special District including the Hawaiian Electric Company's downtown power station. The station will function as a connection between Aloha Tower and the Central Business District. A pedestrian overpass is part of the design for the station, which will play a significant role in safely moving people over Nimitz Highway.

#19 Civic Center Station. Located on Halekauwila Street between South and Keawe Streets, this station is adjacent to land that is part of Kamehameha School's Kalaulu O Kaka`ako Master Plan. A block away form the station is the historic Mother Waldron Park, which will be the beginning of Kamehameha School's planned park-to-park connection down to the Kaka`ako Waterfront Park and the Pacific Ocean.

#20 Kaka`ako Station. This station is planned to be located on property that is part of the Ward Neighborhood Master Plan. The site is positioned on the corner of Ward Avenue and Queen Street and will operate as the closest stop to Kewalo Basin Harbor, the Ewa side of Ala Moana Beach Park, the Diamond Head side of Kaka`ako waterfront and the Blaisdell Arena, Exhibition and Concert Halls.

Bicycle

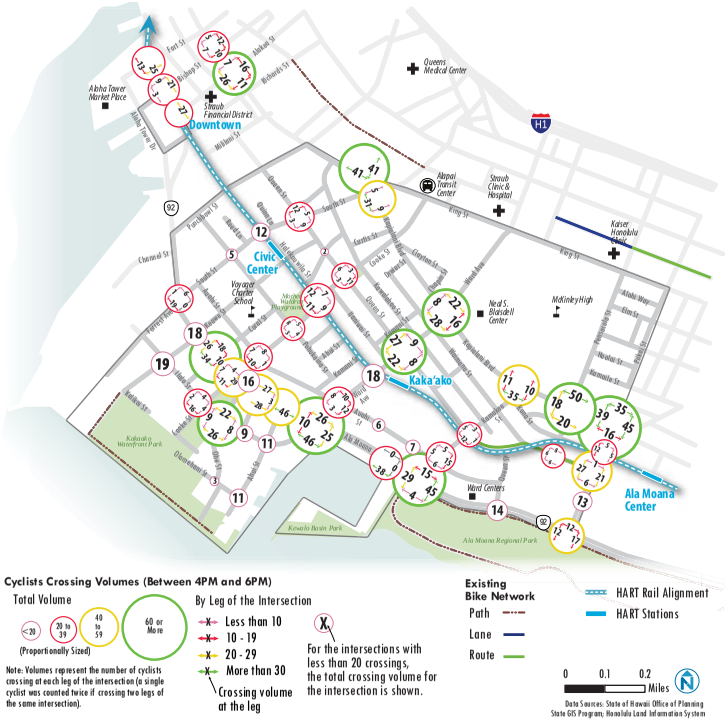
Relative to other U.S. and Canadian cities with well developed bicycle infrastructure, the rate of bicycle travel in the KCDD is relatively low. For example, a single intersection on a bicycle route on the fringe of San Francisco, Seattle, or Vancouver, B.C. downtowns might accommodate 600 to 1000 bicycles in a two hour peak period. Comparatively, the highest volume intersections in the KCDD have just over 100 bicycles entering the intersection between 4 and 6 PM. Bicycle volumes entering major intersections around the district during this time period are illustrated in Figure 5-5.

The highest volume of bicycle traffic occurs at:

- Intersections along Ward Avenue, particularly at Kapiolani, Queen, and Ala Moana
- Intersections along Ala Moana, including Kamakee, Ward and Coral. These are points where cyclists using the trail makai of Ala Moana might chose to cross
- Intersection of Kapiolani and Pensicola and Piikoi

The counts from which this data was derived did not track cyclists' use of the trail through Ala Moana Park, which is a popular cycling route.

Figure 5-5 Bicycle Volumes in the KCDD (2013 PM Peak Hours)

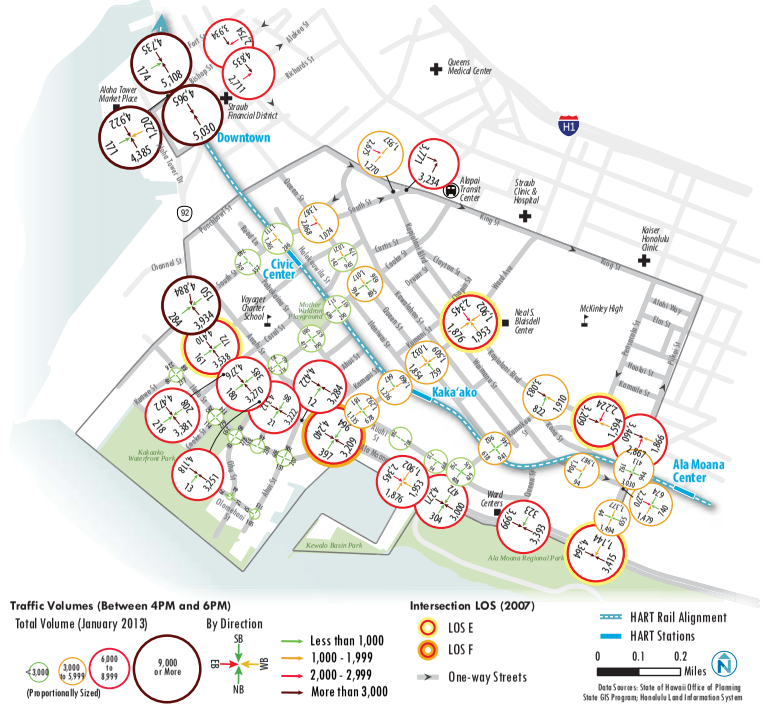


Motor Vehicle

Traffic volumes at over 40 intersections in the KCDD were counted during an average weekday in late January 2013. Figure 5-6 below shows the volume of vehicles entering each intersection during a two-hour period during the afternoon travel peak. The heaviest volumes of traffic occur on Ala Moana and along Kapiolani Boulevards. The map shows intersections where traffic delay is greatest, indicated by vehicle level of service (LOS) of E or F. These ratings indicated significant delay during the peak hours.

Truck traffic was also tracked during these counts showing that Ala Moana is by far the busiest route for large trucks moving through the district. However, even there truck traffic constitutes a low percentage of total vehicular traffic. Truck volumes account for only 2.9% of AM peak and 1.0% of PM peak period motor vehicle volumes on Ala Moana.

Figure 5-6 Traffic Volumes in the KCDD (2013)

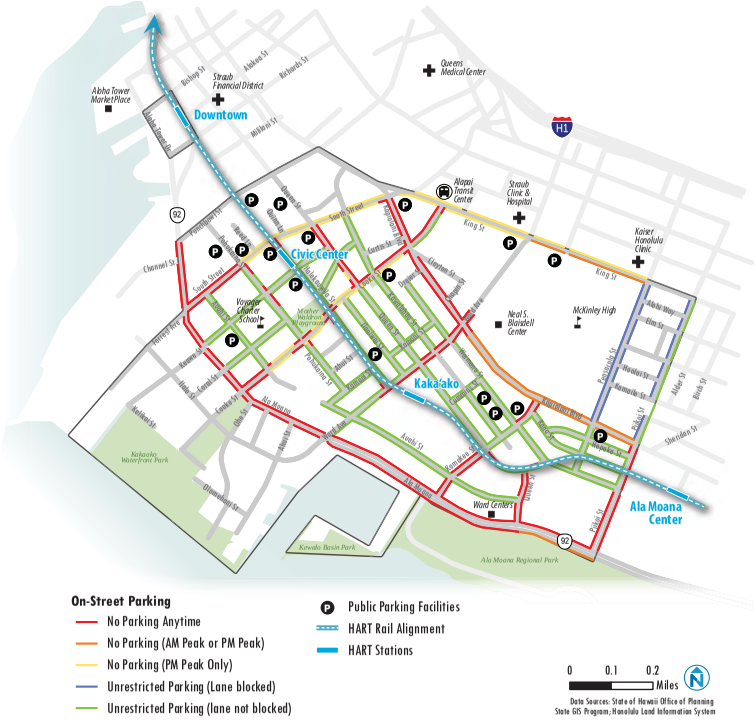


Parking

On street parking regulations vary from street to street in Kaka'ko. In some places curb parking is free and unregulated, in others there are time regulations, such as one hour time limits. There are also meters requiring parkers to pay during daytime hours. Several larger through-streets in the district prohibit curb parking entirely, or restrict it to off-peak periods. Figure 5-7 illustrates different curb parking treatments around the district. Unregulated on-street parking often fills to capacity early on typical weekdays by workers arriving to jobs in the district or parking for free in the district and walking to jobs in adjacent areas. There are 17 off-street public parking facilities including a large cluster of garages around the Civic Center area in the north-west side of the district. Under existing regulations, all private development must also provide a specified amount of off-street accessory parking.

Chapter 8 discusses parking management strategies for the KCDD.

Figure 5-7 Parking in the KCDD



DRAFT

Mobility and Access Strategies

As in other urban districts around the nation, Kaka`ako's streets have always served multiple functions. Earlier in the twentieth century, they were the primary component of transportation infrastructure, allowing people and goods arriving by boat to reach local destinations throughout the city. This led to vibrant, busy streets serving pedestrians, bicycles, streetcar transit, autos, and a number of other modes. As vehicle ownership and use increased dramatically in the second half of the twentieth century, the city had to accommodate the trend within the space for streets that had already been established.

Over time, street design focused primarily on motor vehicle movement, and the emerging disciple of traffic engineering worked to safely integrate cars and trucks into pre–existing urban forms. While there were clear benefits to accommodating the automobile movement through the city, the negative effects have become increasingly evident over the last half century. The focus on automobiles has resulted in different forms of land development, namely emphasizing vehicle access (and not person access) to buildings and property, and has come at the expense of other uses of the street and other transportation choices.

KCDD TOD Overlay Plan builds on the Mauka Area Plan policy framework and proposes a comprehensive approach to the creation of a multi-modal transportation system that allows the Kaka`ako community to choose a different direction for its future and recreate a system of streets that balance mobility needs with the community-serving functions that streets have traditionally provided.

The TOD Overlay Plan treats the entire KCDD in a holistic manner as an integrated transportation management sphere with requirements for trip reduction, transit enhancements, pedestrian and bike improvements, shared parking and enhanced transit. Implemented simultaneously, these elements will result in walkable and bikeable streets, vibrant retail districts and enjoyable access for residents and visitors. In this approach, the KCDD streets are envisioned as verdant recreational corridors that contribute not only to mobility and accessibility, but to the District and City's overall public health.

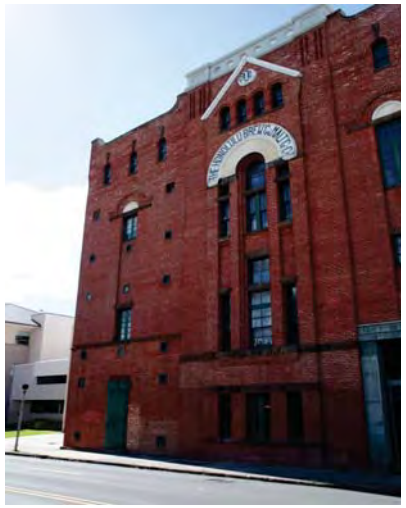
The following sections identify strategies that will not only operationalize more efficient use of Kaka`ako's streets, but also ensure the district's streets establish a vibrant residential and commercial urban center while achieving broader community goals. Strategies are organized into two components—connectivity and the modal hierarchy established in Figure 5-1, and are supported by implementation-focused actions and regulatory changes.

Many of the strategies presented in the TOD Overlay Plan related to mobility and access are not the direct responsibility of HCDA and may require inter-agency coordination or partnerships to ensure implementation. In these cases, strategies appear as considerations and guidelines, rather than firm requirements.

Kaka`ako's street grid creates long block faces and skewed intersections. Future connectivity improvements will improve safety at intersections and reduce travel time for all modes.
Image from HCDA

CONNECTIVITY

A well-connected street network provides shorter travel distances and makes it possible for people to walk or cycle to transit services quickly and conveniently from the places they live, work, shop, and play, while also supporting walking and cycling as everyday transportation options on their own. When deciding whether to use transit, one of the most important factors people consider is the distance between their origin and a transit passenger facility (stop, exchange, or station) and again to their destination. What matters for the traveler is not the straight-line or 'as the crow flies' distance but, rather, the actual walking distance using the available streets and paths.



The Honolulu Brewery building on Queen Street is one of the few historic buildings surviving in Kaka`ako from the City's streetcar days.
Image from Nelson\Nygaard

In an area with long blocks and dead-end streets, the walking distance can be much further than the straight-line distance. Some destinations that are physically very close to a transit stop or station may still require a long walk. In contrast, a network that offers many closely-spaced streets with good connections between them shortens the walk to transit by providing more direct routes. While cyclists are not as sensitive to distance as pedestrians because they move more quickly, they are more sensitive than vehicle drivers, and so a well-connected street network also promotes cycling. In combination with a vibrant mix of land uses, a well-connected street network helps to create communities where many of the needs of daily life can be met within walking or cycling distance.

Given its flat terrain and historic platting, Kaka`ako has a relatively intact grid of streets compared with much of urban Honolulu. Mauka to makai block distances in particular are relatively short, enhancing the ease of navigation and walkability of the district. However, there are a number of large parcels and blocks that could benefit from a finer grained street network, or set of pedestrian connections.

Figure 5-8 illustrates intersection density in various parts of the KCDD.

Image from Nelson\Nygaard

INTERSECTION DENSITY – PREDICTOR OF WALKABILITY

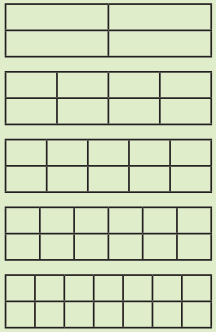
A recent meta-analysis researched and written by Professors Reid Ewing of the University of Utah and Robert Cervero of the University of California at Berkeley evaluated a number of factors thought to be predictive of people's choice to walk and bicycle in an urban setting. The results surprised many experts, pointing to Destination Accessibility as the top predictive factor. Destination Accessibility is the directness with which pedestrians and cyclists can reach destinations within a district or neighborhood.

As Ewing and Cervero put it: **'Almost any development in a central location is likely to generate less automobile travel than the best-designed, compact, mixed-use development in a remote location.'**

One of the best ways to measure this is by evaluating the number of intersections per square mile in an area or the granularity of the pedestrian infrastructure. Intersections are counted as a place where streets or pedestrian accessible paths, lanes, or alleys intersect. Intersection density is one of the measures used by LEED Neighborhood Design to rate neighborhoods and large developments. LEED ND assigns a top score to neighborhoods with 600 intersections per square mile. By comparison parts of Manhattan or Portland, OR have intersection densities over 1000 per square mile and suburban locations often have intersection densities in the range of 100 – 150 per square mile.

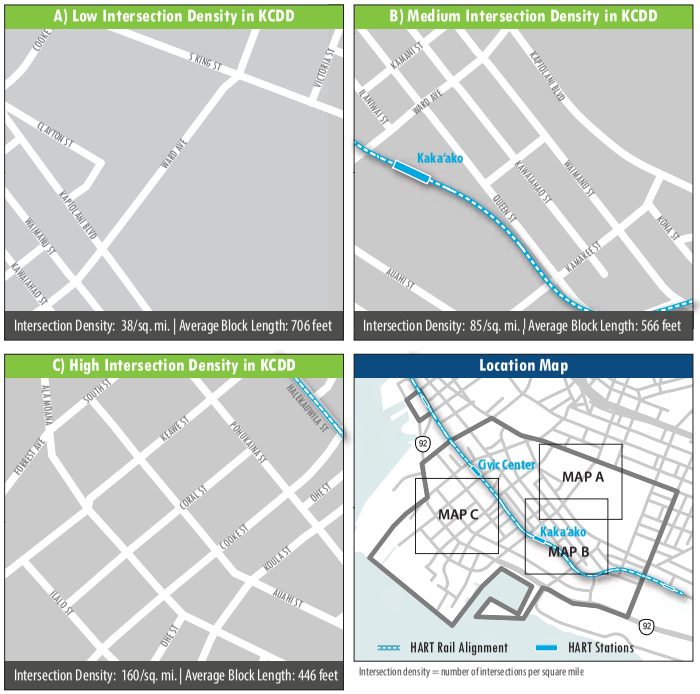
Since most people cannot visualize what 200 or 400 intersections per square mile looks like, the following relate these intersection densities in terms of block size:

- 140 intersections per square mile = 400' x 750' average block size
- 200 intersections per square mile = 400' x 350' average block size
- 300 intersections per square mile = 300' x 310' average block size
- 350 intersections per square mile = 300' x 265' average block size
- 400 intersections per square mile = 300' x 230' average block size



Source: Travel and the Built Environment: A Meta-Analysis. Reid Ewing and Robert Cervero. Journal of the American Planning Association, Volume 76, Issue 3, 2010.

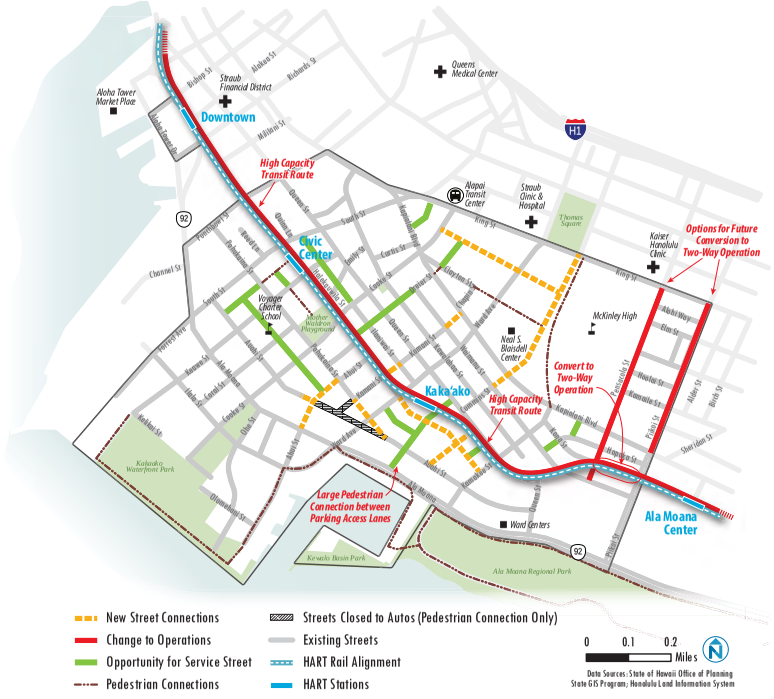
Figure 5-8 Intersection Density in KCDD



Note: The following analysis only calculates intersection density for full street connections, not pedestrian and service alleys.

Redevelopment of large parcels within the district will improve network connectivity. Figure 5-9 provides guidance for the HCDA when working with developers to subdivide large redevelopment parcels. This network connectivity concept builds on existing Kamehameha Schools and Ward Neighborhood master plans and suggests modifications and additional connections for autos, service vehicles, and pedestrians. Service streets refer to narrow street connections that provide access to off-street parking, delivery and loading needs, and limited amounts of on-street parking storage.

Figure 5-9 Current KCDD Street Grid and Potential Future Connections



MORE STREET CONNECTIONS PROMOTE WALKING, CYCLING, AND TRANSIT

Many researchers have found that higher levels of intersection density (i.e., more intersections) result in lower levels of overall travel by automobile and higher likelihoods of travel by sustainable modes. Schlossberg et al. (2006) used a student travel mode to school survey to show that higher intersection densities increased students' likelihood of walking by up to five times. Research from Ozbil et al. (2009) highlights the importance of street connectivity for transit users, specifically at the one-quarter mile distance from transit facilities, in increasing the likelihood of transit use.

Ozbil et al. (2009). "The Effects of Street Configuration on Transit Ridership." Proceedings of the 7th International Space Syntax Symposium. www.sss7.org/Proceedings/.../084_Ozbil_Peponis_Bafna.pdf

Schlossberg et al. (2006). "School Trips: Effects of Urban Form and Distance in Travel Mode." Journal of American Planning Association, 72(3), 337-346. www.pages.uoregon.edu/schlossb/articles/schlossberg_school_trips.pdf

The following specific strategies and actions should be implemented to improve street connectivity and the quality of the KCDD street grid.

Strategy MA1 Provide fine-grained street networks

Action MA1.1 Design block patterns to create a connected grid of streets that minimizes travel distances between points

Section 15-217-58-C (Thoroughfare Network) of the Mauka Area Rules regulates the subdivision of large lots to create a permeable network of streets and pedestrian ways. It provides direction on connections that will help to create a fine-grained mobility network in the KCDD.

Action MA1.2 Ensure that large developments provide internal streets and/or pedestrian connections that support the TOD Overlay Plan circulation network and which are permeable for public use by pedestrians, cyclists, and emergency vehicles

Increasing pedestrian connectivity is key opportunity as large industrial and commercial blocks are redeveloped with more urban uses. Section 15-217-58-C (Thoroughfare network) of the Mauka Area Rules regulates the division of large parcels. While the rules are sound they must be strengthened by requiring pedestrian oriented block sizes, encourage connectivity, and encourage mid-block service alleys.

The rules will require new street or pedestrian connections at minimum every 300 feet and by requiring that any new avenue or district street connect to the street grid on both ends (or be designed to provide that connection with further development phases) unless there is a compelling reason not to make the connection.

Both pedestrian streets shown above also provide mid-block access to parking facilities and are carefully designed to minimize the effect of auto access. This treatment eliminated curb cuts on the main street and allows enhanced pedestrian connectivity on these longer development blocks.
Images from Nelson\Nygaard

A pedestrian street in Boulder carries one-way traffic, includes a cycle track, and broad sidewalks. Brick treatment enhances the pedestrian zone.
Images from Nelson\Nygaard

HCDA may require through-block pedestrian connections when a substantial portion of a block is developed with commercial projects or when the ground floor uses are largely commercial. In cases where adequate lot size exists to develop two commercial projects on a block, a through block pedestrian connection should be required. Connections should be required at mid-block and have a minimum clear dimension of 20 feet both horizontally and vertically.

Figure 5-8 provides examples of intersection density in parts of the KCDD. Overall, the district currently has an average intersection density of 134 intersections per square mile (vehicular intersections only).

Requiring Kamehameha Schools, Ward, and major parcel subdivisions to achieve a minimum intersection density of 300 per square mile will ensure that a fine grained street network is developed. Intersection density measures should include well-designed pedestrian ways, shared streets, and service alleys that are adequately designed to provide pedestrian passage through a development.

Action MA1.3 Design surface lots in the interim for efficient and comfortable pedestrian movement

Because redevelopment takes time to occur, existing surface parking lots should be designed to include dedicated provisions for safe and direct pedestrian circulation, including adequate lighting, shade trees, internal walkways, crossing facilities (including raised crossings), and pedestrian priority paving treatments. Where larger areas of surface parking exist, introduce a street and block pattern within parking lots to enhance pedestrian access and enable the introduction of streetscape treatments.

Strategy MA2 Plan for coordinated, multimodal transportation networks

Action MA2.1 Classify streets by their level of priority for vehicle, transit, and goods movement, and also for bicycle and pedestrian travel, and apply street design and performance standards to match these levels of priority

The remainder of this chapter describes the priority street network and linkages for each major mobility mode. These priorities are not street classifications in themselves, but a method to consider how network needs for each mode within the proposed street grid and how those interact with other

CLASSIFYING MULTIMODAL STREETS

Under the conventional approach, or functional classification, streets are defined by the degree to which they emphasize through-movement versus local access. Arterial streets are designed primarily for through-movement, local streets are used primarily for local access to property, and collectors are used to connect them.

In cities that take a more multimodal, 'complete streets' approach, streets have a bigger role than just moving traffic. In addition to providing for the movement of all road users – including pedestrians, bicycles, transit vehicles, and goods – such streets provide access to adjacent land uses, accommodate utilities, and serve as a vital part of the neighborhood by offering open space for socializing and recreation.

There are four key elements of street design that are useful to understand and consider when classifying streets:

- Land use context
- Priority for the movement of each mode
- Relationship to other streets in the network
- Available right-of-way

In places where the functional classification system still dominates, a simple way to transition toward a more multi-modal classification system is to identify how street types fit in with land uses. This approach can help to break down rigid street types such as arterials into the types of urban environments they are likely to pass through, and consideration can be given to customized treatment of the roads (e.g., through special overlay designations) within those particular contexts.

More detail about street design and performance is provided in Chapter 6 – Complete Streets.

modal priorities and adjacent land uses. Chapter 6 – Complete Streets – considers these priorities in assigning KCDD street classifications and providing design guidance.

Strategy MA3 Manage delivery and parking access to reduce conflicts with pedestrians and optimize the efficiency of the street network

The existing Mauka Area Rules provide a good regulatory structure for reducing the impact of parking access, loading, and other service uses on the quality of the pedestrian environment and the functionality of district streets. The following proposed actions support and enhance the existing rules.

The shared street that evolved through the development of an older warehouse district in NW Portland became a favorite of locals, so much so, that the street character was replicated for new development fronting the street. These photos show a historic area in the neighborhood and more recent development.
Images from Nelson\Nygaard

Action MA3.1 Designate parking access and loading streets and require developers to provide ingress and egress from minor local streets

Section 15-217-63-B (Parking Access) of the Mauka rules requires parking access be located in the following priority order if feasible:

- From an alley
- From a designated parking access street
- From any available alternative parking access street

The rules provide developers an opportunity to submit an alternative access plan. As part of the alternative access plan allowed in the rules, crossover easements should be allowed to expanded access to parking. These rules should be applied throughout the district and alley or parking access street entry/egress should be required on development sites large enough to require new alley/service streets.

Section 15-217-63-L (Loading Access) restricts loading zones on thoroughfares and promenade streets. This Plan recommends that these restrictions be updated to include boulevards and avenues (as defined in Chapter 6), particularly those designated for bicycle or high frequency transit uses.

See Chapter 6 for proposed locations and design guidelines for parking access and service streets.

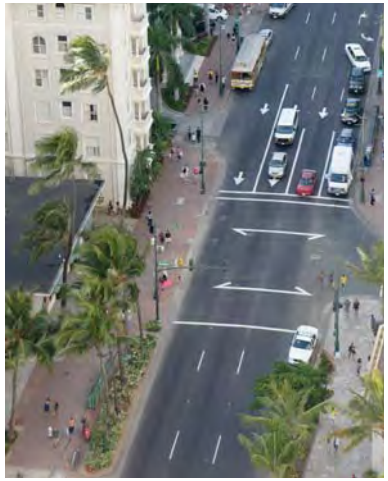
Action MA3.2 Encourage design that minimizes curb-cuts on all streets, particularly for high volume uses such as parking garages

HCDA can limit the number of curb cuts that provide driveway access on Commercial Boulevards, Commercial Avenues, and District Streets (conceptual street types; see Chapter 6). This will ensure access to off-street parking lots and structures is focused on lower speed Local Streets, whose main function is to provide access to parking. This strategy will reduce conflicts with pedestrians and cyclists and strategically and efficiently focus search-for-parking traffic. On top of the safety benefits of managing driveway access, this strategy will have ancillary capacity benefits for Commercial

Boulevards and Avenues as well as District Streets by reducing delay from vehicles slowing to enter or exit a driveway.

- Establish maximum curb cut widths for driveways and parking facility entrances to minimize the impacts to the pedestrian realm and to create more consistent walking paths.
- Orient parking garage access points toward side streets or alleys to reduce the potential for conflict between cars and pedestrians on busy streets.
- Restrict the frequency of curb cuts by establishing maximum driveway density standards.

Section 15-217-63-C (Curb Cuts) of the existing Mauka Area Rules requires developers to minimize curb cuts to the minimum practical extent. Prohibitions on curb cuts for drive through facilities such as banks and gas stations should be set for all boulevards and avenues. No driveways used to approach or queue for such facilities will be allowed.



On Kalakaua Avenue in Waikiki, limited curb cuts and wide sidewalks help create a world-class pedestrian environment.
Image from Nelson\Nygaard

Strategy MA4 Make walking and cycling access to frequent transit as direct as possible

The distances people are willing to walk to transit vary depending on length and purpose of the trip and quality of the pedestrian environment, as well as on weather, topography, and demographics. Generally, people will walk further to access limited-stop transit services than local service and further still for rapid transit services. Paths of travel to and from transit passenger facilities must be as direct as possible, both to minimize the distance people are required to walk to transit and to maximize the number of people who have convenient access to it.

The network walk distance map on page 5-8 illustrates the network walk times for pedestrians using sidewalks to access stations in the KCDD and adjacent neighborhoods.

More detail policies and actions are included in Chapter 7 HART Stations and Access.

Strategy MA5 Implement a coordinated multimodal wayfinding program

Wayfinding strategies seek to efficiently coordinate movement within the district, pointing users of all modes of travel to the best access routes for their destination. Wayfinding can direct visitors, shoppers and residents to parking facilities, retail establishments, pedestrian and bicycle access routes, and other important destinations. Wayfinding represents an important part of a comprehensive circulation and parking management strategy, improving the customer-friendliness and expanding connectivity by improving network legibility.

> Kaka`ako can be a more competitive and attractive locale if spatial information depicted in wayfinding systems can accurately represent the image of the district to residents, workers, and visitors.

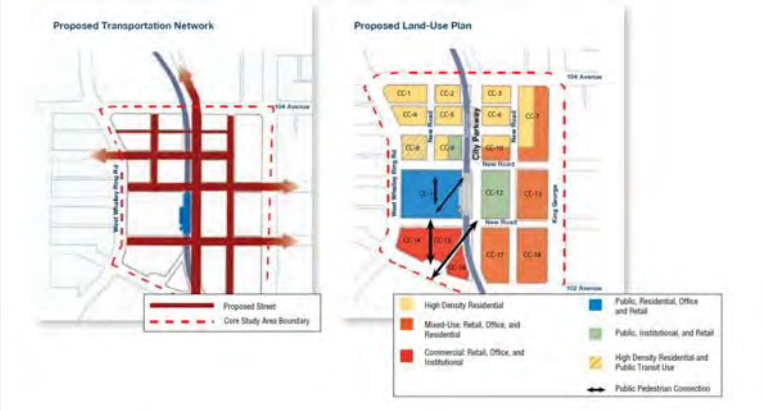
HCDA will establish a coordinated multimodal wayfinding program for the district using a single brand for all modal wayfinding signs. This program will help to orient visitors, highlighting key destinations

PROVIDING FINE-GRAINED CONNECTIONS IN SURREY CITY CENTER, VANCOUVER BC METRO AREA

Surrey City Center is a major urban development area in the Vancouver British Columbia metro area and is expected to attract significant amounts of new development over the coming decades. The City of Surrey has been redeveloping their City Center as a more pedestrian- and transit-oriented urban community that acts as a hub of activity south of the Fraser River. A key aspect of the planning framework is breaking down the current 'superblock' street pattern into a more fine-grained grid and reducing the average block size in the area from 1300 feet to a more pedestrian-oriented 300 – 500 feet. This change will be accomplished by adding three new east-west streets and two new north-south streets, providing significant enhancements to pedestrian, cyclist, and vehicle circulation while also creating efficient and practical development parcels.

New streets will be designed to have downtown-scaled sidewalks to support pedestrian movement. New signalized crosswalks will be added at existing and proposed intersections, and a minimum of one additional crossing of King George Boulevard will be added to improve access to retail services located on the east side of the main arterial. Bicycle access will be provided through the City Centre by way of a greenway, which will connect to the existing bicycle network, rapid transit stations, and local destinations.

The City Centre Plan focuses growth and development around the Surrey Central SkyTrain Station and civic plaza to optimize door-to-door travel times and provide a focal point for transportation and community activity. The orientation of a City Hall and public library toward transit – in combination with the integration of signage, public art, and distinctive public realm design in the plaza – will contribute to reducing perceived distance to transit.



and paths of travel for all modes of transportation. A key to success will be consistent signage and symbology across modes and throughout the district. A wayfinding program can be tailored to specific groups depending on contextual factors and desired outcomes; however, these tools are most relevant and important for those unfamiliar with the area. Wayfinding informs people of the best way to reach key destinations and transportation nodes/facilities, depending on their mode of travel, using factors like time, comfort, destination access, and even pedestrian cut-throughs.

A well-designed wayfinding sign in Portland, OR.
Image from Nelson\Nygaard

Action MA5.1 Establish a wayfinding program and study needs

The district will establish a formal wayfinding program, with staff time dedicated to the effort. It should begin by undertaking a detailed study of current wayfinding needs in the district and outlining a comprehensive program to meet these needs, addressing all modes of transportation. The needs assessment and overall strategy must be updated on a regular basis as development occurs.

Action MA5.2 Implement a wayfinding strategy

Once needs are understood, the district can implement a comprehensive wayfinding strategy that addresses all modes of transportation. This strategy may include both static elements, including signs and maps, and, where needed dynamic elements, such as real-time transit arrival and/or parking availability information. In addition to providing information signage should be designed to support a sense of place in the district, including design elements that are culturally relevant to Kaka`ako. The strategy must also take care to provide relevant information to people of all abilities, including those with mobility and visual impairments.

- **Bicycle and Pedestrian wayfinding: Maps, directional signs, and other elements should be provided highlighting safe bicycle and pedestrian paths of travel to key destinations.** Signs for pedestrians and bicyclists can direct those on foot or on bike to the safest bicycle and pedestrian routes, as well as the location of bicycle parking spaces, showers, changing facilities, and other bicycle and pedestrian amenities.
- **Transit: Sign and maps should be provided, particularly at and around stations and key stops.** Real-time transit arrival information should also be provided at the highest-demand stations and stops.
- **Parking: Parking signs can direct motorists to underutilized off-street facilities, freeing up the most convenient "front-door" curbside spaces, and maximizing the efficiency of a parking system.** Where needed, dynamic parking signage can also display real-time availability data, pointing motorists to facilities with available spaces.

Image from Transport for London

Image from Transport for London

MAKING CITIES LEGIBLE WITH MULTIMODAL, INFORMATION-RICH WAYFINDING

Cities around the world are investing in high quality multimodal wayfinding programs to remain competitive as tourist locations and make their streets more legible for residents and visitors, alike. Transport for London's (TfL) *Legible London* is a map-based multi-user information system to help people navigate the city on foot and by bicycle and to improve walk time to transit and local destinations. It includes continuously updated, scaled, digital base maps and signs, which replace often inconsistent and redundant signs. Research found that people were relying on the tube map, which is out of scale, so it seemed destinations were farther by foot than they actually are. *Legible London* was developed by Transport for London in collaboration with the Central London Partnership, the Greater London Authority Walking Advisory Panel, local borough councils, and the New West End Company – a partnership of businesses in London's West End shopping neighborhood. Legible London includes a continuously updated digital base map, made available for many uses and to developers and others for installing anywhere. The maps and signs are intended to replace inconsistent and redundant signs installed by various entities across London. The program had five primary objectives: (1) increase the number of people walking in the city; (2) build confidence among pedestrians; (3) reduce the amount of clutter in the pedestrian environment; (4) improve the perception of walking in the city; (5) and reduce journey times.

Image from Transport for London

Image from NYC DOT

New York City's new wayfinding system (near implementation) takes *Legible London* a step further by reinforcing the multimodal, and often intermodal, nature of the city and the need to accommodate directional information to different street users. The NYC system offers different directional sign types for different users (including people walking to transit or destinations within the neighborhood as well as people bicycling between destinations and neighborhoods) and layers multimodal and destination-based figures into information rich maps.

RULE CHANGES FOR KAKA`AKO

Create a Fine-Grained Street Network

- **Regulation MA1.1:** Related to internal connections for large developments, require pedestrian connections or service street between buildings where block lengths exceed 300 ft.
- **Regulation MA1.2:** Related to internal connections for large developments, require through-block pedestrian connections when a substantial portion of a block is developed with commercial projects or when the ground floor uses are largely commercial. In cases where adequate lot size exists to develop two commercial projects on a block, a through block pedestrian connection is required. Connections are required at mid-block and have a minimum clear dimension of 20 feet both horizontally and vertically.
- **Regulation MA1.3:** Require master plans and large developments to achieve an intersection density of 300 intersections per square mile or better, including shared streets, pedestrian ways of 20' or greater, and service alleys designed with adequate space for pedestrian movement.

Plan for Coordinated, Multimodal Transportation Networks

- **See Chapter 6**

Manage Delivery and Parking Access to Reduce Conflicts with Pedestrians and Optimize the Efficiency of the Street Network

- **Regulation MA3.1(a):** Apply Section 15-217-63-B (Parking Access) requiring parking access from an alley or service/parking access street to all parts of the KCDD. Require parking access from alley or service/parking access street for all development sites where 300' minimum street spacing requirements apply.
- **Regulation MA3.1(b):** Expand Section 15-217-63-L (Loading Access) of the Mauka Area Rules requiring on loading zones on thoroughfares and promenade streets to include avenues, particularly those designated for bicycle or high frequency transit uses; Include an exception process if the development site is not sufficient in size to allow an internal alley.
- **Regulation MA3.2:** Restrict curb cuts for drive-through on Commercial Boulevards and Avenues where reasonable alternative access is available; For drive-through uses, prohibit curb cuts and driveways used to approach and exit drive-through facilities, stacking areas for waiting vehicles, and the facility itself, such as a drive-up window or gas pump island.

Make Walking and Cycling Access to Frequent Transit as Direct as Possible

- **See Chapter 7**

Implement a Coordinated Multimodal Wayfinding Program

- **Regulation MA5.1:** Ensure wayfinding placement provisions in Figures PZ1-7 and FT1-12.
- **Regulation MA5.2:** Establish an additional general figure after Figure 1.16 in the Mauka Rules that identifies prospective wayfinding sign locations by type of sign.

PEDESTRIAN

Walking

The Role of Walking

From walking the dog, to strolling to the beach, to getting to work or school, to running to the corner store for that last ingredient for a recipe, walking is the foundation of the transportation and civic life in KCDD. Walking is important for many reasons:

- **Walking supports the whole transportation system.** Every trip begins or ends as a pedestrian trip, whether it's getting from the bus stop to the office or from the store to the parking lot. A complete, high-quality pedestrian network is necessary to make all aspects of the transportation system function well. In particular, the success of the transit system is dependent upon high-quality walking routes to and from transit stops and stations.
- **Walking provides active recreation and promotes healthy lifestyles.** Walking is the most common recreation activity among Honolulu residents and visitors. This is especially true for children and seniors. Providing spacious sidewalks and pedestrian promenades lined with landscaping, public art, and interpretive design can encourage recreational walking in Kaka'ako, attracting visitors to the district and promoting active, healthy lifestyles for residents.
- **Walking provides a no-cost transportation choice.** Walking is the lowest cost form of transportation. Combined with a mixed-use pattern of development, better walking conditions accommodative of all ages and abilities can improve opportunities for disadvantaged populations by reducing the share of household income that must be spent on auto ownership and operation.
- **Walking promotes a vibrant economy and supports local retail.** Although less than one-quarter of KCDD's land use will be retail, providing connected, walkable and pleasant streets can catalyze and support lively retail streets. Compact, accessible, and mixed use districts foster employment, economic productivity, and tax revenues.[1] Property values begin to rise as neighborhoods become more pedestrian-friendly and increase access to goods and services.[2] Pedestrian-friendly design also strengthens the retail market. Studies have shown increases in sales tax revenue up to 30% in commercial areas retrofitted into pedestrian-oriented districts.[3]

> "There comes a time when people listen to their hearts and feet, getting back to the fundamentals leading to the basic qualities of health, vitality, security and life. All good towns—towns people are in love with—are based on walkability. Everything else comes second. Everything."
>
> *—Dan Burden*

Despite the importance of walking for the life of the District, Kaka`ako today lacks many of the basic elements of pedestrian infrastructure and amenities necessary to unlock the benefits detailed above. Developing a high-quality pedestrian environment in the KCDD is critical to meeting the goals of a lively, active, and transit-oriented community.

1 International Economic Development Council (2006), *Economic Development and Smart Growth: Case Studies on the Connections between Smart Growth Development and Jobs, Wealth, and Quality of Life in Communities*, www.iedconline.org/Downloads/Smart_Growth.pdf.
2 Mark Eppli and Charles C. Tu (2000), *Valuing the New Urbanism; The Impact of New Urbanism on Prices of Single-Family Homes, Urban Land Institute.*
3 Local Government Commission (2001). The Economic Benefits of Walkable Communities. Fact Sheet. http://www.lgc.org/freepub/docs/community_design/focus/walk_to_money.pdf

DRAFT

The Pedestrian Network

Every street in Kaka`ako must be a pedestrian street, first and foremost. Different types of streets play different roles in the district. Figure 5-10 illustrates where pedestrian design and investment are prioritized as the district develops and the TOD land use alternative is realized.

- **Primary** pedestrian priority streets are those that connect key destinations in or adjacent to the district, including HART rail stations, and that will ultimately support active street front uses such as retail stores,

What is missing from this Kaka`ako scene? People. A great walking district will bring life to the streets.
Image from Nelson\Nygaard

Figure 5-10 Pedestrian Priority Streets in the KCDD

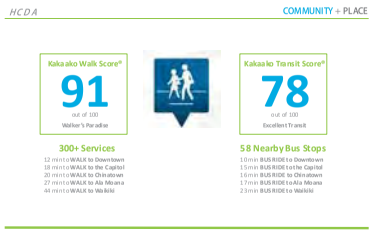
public plazas, and entertainment venues. These streets require spacious sidewalks and a high level of pedestrian amenity.

- **Secondary** pedestrian priority streets are those that do not provide direct connections to major destinations or have very high traffic volumes. While these streets may never be ideal for walking along for long distances, they must still be safe enough to accommodate walking, and they should be easy and safe enough to cross that they do not serve as a barrier to pedestrians.
- **Low speed** streets are generally service streets that may have narrow widths and where pedestrians and traffic may even be asked to mix in a shared right-of-way. Note that the term "low speed streets" should not be interpreted to suggest that high-speeds are promoted anywhere in the KCDD.
- **Greenway** connections are streets where there is opportunity to connect parks, greenspace, and public plazas with well-landscaped, shaded, and interesting walking routes.

The following strategies, in addition to those presented in Chapter 6 – Complete Streets - support the development of the KCDD as a highly walkable urban district.

Strategy MA6 Create a well-connect pedestrian network

Walkability begins with a well-connected street network. Short blocks and more intersections allow pedestrians to reasonably direct paths. Because people walking move much more slowly than people driving or riding bicycles, direct paths of travel are essential for allowing walking to be a viable mode of transportation. Street network connectivity is addressed in detail in the Connectivity section of this chapter.



Strategy MA7 Ensure that walking is safe and comfortable for everyone, everywhere in KCDD

Streets in Kaka`ako should be built and managed to prioritize the safety and comfort of pedestrians. The following actions will be necessary to create such an environment. HCDA will elaborate on these actions when it develops a set of Complete Streets Design standards.

Action MA7.1 Develop standards for safe and comfortable sidewalks and pedestrian crossings

HCDA will establish standards for high-quality pedestrian facilities in Kaka`ako. Important elements to consider will include:

- **Sidewalks and pathways: HCDA will build into its future Complete Streets Design Standards a set of standards for gracious sidewalks that invite pedestrian travel.** Attention to detail is vital in the design of the pedestrian environment: The most comfortable and functional sidewalks have five zones that vary according to the street's land uses and pedestrian volumes: frontage, throughway, furnishing, edge, and extension zones. Each of these zones should be sized appropriately, according to land use context. When considering sidewalk width, standards should be set with attention to both forecasts density and land use context, so that sidewalks to accommodate existing and expected future pedestrian volumes.
- **Street crossings: Most pedestrian collisions occur when pedestrians are crossing a road.** To minimize the risk of collision and encourage walking by people of all ages and abilities, design standards should address signal timing and design; crosswalk placement and visibility; curb ramps; curb radii; sight lines; traffic calming, and illumination. Design standards should ensure that pedestrian crossings are also frequent and well-located relative to pedestrian desire lines, reducing the incentives for pedestrians to cross elsewhere.

Chapter 6 provides additional guidance on the basic principles of pedestrian design along and across the street.

Action MA7.2 Apply Universal Design principles to ensure that Kaka`ako is accessible to people of all ages and abilities

The public realm in Kaka`ako must be accessible to people of all ages and abilities. In designing streets, HCDA must take steps to ensure that all pedestrian facilities are fully accessible to people with limited mobility (including those using mobility devices), as well as people with visual, hearing, and intellectual impairments. Accessibility in public facilities is a requirement of the Americans with Disabilities Act. In addition, with an aging population, providing for people with disabilities will be increasingly important, both to providing for the needs of local residents, and for accommodating visitors to Kaka`ako. In Kaka`ako, providing for Universal Access will require the following steps:

- **Encode the principles of Universal Design into KCDD streets when HCDA develops**

An urban street alive with pedestrians in Chicago, IL.
Image from Nelson\Nygaard

Pedestrian countdown signals can assist help make crossing safer.
Image from Nelson\Nygaard

Complete Streets Design Standards. Standards should consider issues such as curb ramp design and placement; minimum widths for sidewalk throughway zones; accessible bus stop design; signage placement and design; and time signal time allotted for pedestrian crossings.

- **Inventory the district and prioritize the highest-priority areas for remedial treatment of accessibility problems.** Development of street design standards will ensure accessible sidewalks are provided with future development. However, the district currently has many areas where accessibility is lacking, including missing curb ramps and sidewalks. Focusing on maintaining paths to transit and other important destinations, HCDA should create a prioritized list and funding plan for addressing accessibility issues in the near term.

Accessible curb ramp.
Image from San Francisco Department of Public Works.

Action MA7.3 Develop a district-wide traffic calming plan

Slower vehicle speeds lead to fewer and less severe collisions with pedestrians. Generally, when a vehicle is traveling less than 18 mph, it is very unlikely to cause a fatality in the event of a collision. Slower vehicle speeds also improve the feeling of comfort and safety for pedestrians. When it develops Complete Streets Design Standards, HCDA will develop and implement a traffic calming program to slow vehicles in strategic locations to speeds that are consistent with pedestrian comfort and safety. Elements of the program should:

- Encode into street standards a set of approved traffic calming treatments that are appropriate for each street type in the district, with variations depending on context. Traffic calming strategies can include elements like narrowed travel lanes and tight turning radii at corner; curb bulb-outs to visually narrow the roadway; chicanes; speed tables, and other elements.
- Monitor speeds and prioritize improvements. HCDA and the City must work together to monitor places where vehicle speed consistently exceeds posted speed limits for the street type and/or safe and comfortable speeds for pedestrians. A list of high-priority locations should be maintained, and funding sought to implement needed traffic calming treatments.

Mid-block crossing and "choker" island helps to reduce vehicle speeds (Portland, Oregon).
Image from Nelson\Nygaard

Action MA7.4 Develop criteria to prioritize investment in pedestrian facilities

There are needs for pedestrian facility enhancements throughout the Kaka`ako district. While some new facilities will be provided along with new development, HCDA and the City must set priorities for where investment in improved pedestrian facilities can do the most to create a vital, walkable district.

Key considerations include:

- **High density areas.** Areas with high concentrations of workers, residents, and visitors will have higher volumes of pedestrians. It will be important to ensure that sidewalks, crosswalks, and other facilities have the capacity to support the intended uses. These areas should be prioritized for investment: in many cases, developers may be able to contribute to the cost of needed facilities.
- **Vulnerable residential populations.** Residential areas with large numbers of potentially vulnerable pedestrians, as seniors, people with disabilities, and young children, should be prioritized for pedestrians.
- **High collision streets and intersections.** Streets and intersections with a large number or high severity of vehicle-pedestrian collisions should be prioritized for remediation. Priority pedestrian safety investments will address collision "hot spots" and counteract potentially hazardous street design. Identifying clusters must be based on detailed safety analysis and will require conducting a Pedestrian Safety Action Plan.
- **Routes to transit.** Safe and direct pedestrian paths to transit stations and stops are essential for supporting the transit system as a convenient mode of travel. These routes should be prioritized for investment. Specific recommendations for access to transit stations are provided in Chapter 8.
- **Routes to schools, parks, and community facilities.** Other community facilities serve as important destinations for pedestrians. Many communities have programs for Safe Routes to Schools projects, which have dedicated federal funding. Parks, and important community facilities such as libraries could also be prioritized for investment.

Planters are used to narrow the travel lane and create a tighter corner radius for vehicles (Honolulu, HI).
Image from Nelson\Nygaard

Pedestrian investments should be prioritized in high exposure locations near transit or other community-oriented land uses and experience relatively high incidences of pedestrian collisions.
Image from Nelson\Nygaard

Strategy MA8 Design buildings and public spaces to support a safe and comfortable walking environment in Kaka`ako

Far more than for other modes of transportation, the buildings and public spaces that surround the street are essential to the experience and utility of pedestrian travel. To support walking as a mode of transportation in Kaka`ako, HCDA should make a focused, coordinated effort to ensure that the district's built environment invites walking. Many of these actions below will be carried out through rule changes that are discussed in the Land Use and Urban Design sections of this plan.

Action MA8.1 Facilitate Crime Prevention through Environmental Design (CPTED) principles in the maintenance of landscaping and building design standards

Freedom from the risk of collisions is only one part of the feeling safe as a pedestrian. Also important is personal security. To encourage walking, it is important to reduce both the real and perceived risk of crime in public places.

Good design can help to enhance safety and security through the principles of natural surveillance and territorial reinforcement. This type of design is often referred to as Crime Prevention through Environmental Design (CPTED). Key principles of CPTED include:

- **Natural surveillance.** This is the principle that when there are many "eyes on the street," the public realm naturally becomes safer and feels more secure. Steps to encourage eyes on the street can include orienting building windows toward streets and public spaces; maximizing active uses like retail on the ground floor of street-facing buildings; designing lighting that eliminates blind spots and dead zones; and maximizing visibility between streets, sidewalks, and buildings by encouraging windows on the ground floor of street facing buildings.
- **Territorial reinforcement.** This is the principle that clear boundaries and transitions between public, semi-public, and private spaces can help establish the sense of ownership and indicate what activities are appropriate in which locations. Strategies can include using seating and other amenities to attract people and establish public 'ownership' of public spaces; using trees and landscaping to define the transition between public and private space; using fencing types to define the character of an area; and ensuring basic upkeep of buildings, lighting, landscaping, and other streetscape amenities, demonstrating to users that a space is being maintained.

LED lighting has high up front costs, but provides substantial safety benefits from its illumination levels and can help created 18-hour activity centers
Image from John Bamber

HCDA must seek to encode these principles throughout its design standards, including rules for private development; design standards for public spaces; and maintenance plans for public spaces.

Action MA8.2 Integrate high quality pedestrian design into the interim use of surface parking lots

In the long-term, this plan envisions significant new compact development in Kaka`ako, with few surface parking lots remaining. However, surface parking will remain part of the district's streetscape for a significant period of time.

Any development on a parcel that includes a surface parking lot will be required to make accommodations for pedestrians. Lots should cater to pedestrian desire lines (direct, optimal walking routes), providing dedicated sidewalks, path connections, and crossing facilities where needed. Trees, landscaping, shade, and other design features should be added to help integrate surface parking fully into a pedestrian-oriented streetscape.

An accessible pathway through a parking lot in Sausalito, CA.
Image from Greg Pasquali

Action MA8.3 Minimize curb cuts

Driveways across the sidewalk interrupt pedestrian paths of travel, and should be minimized whenever possible. Where possible, vehicle driveways should not interrupt the sidewalk's grade and should be made of the same material as the sidewalk so it is clear to drivers that they are crossing a pedestrian zone. Entrances designed to require cars to make right angle turns help force traffic to slow down before entering. Where garage exits are present, visual contact and awareness between pedestrians and drivers should be supported through mirrors, pavement treatments, and noise signals. Mauka and Makai Area Plan rules already support limitations on curb cuts.

Strategy MA9 Provide a beautiful and lively pedestrian environment throughout the KCDD

In great cities, pedestrian travel is not just accommodated: it is welcomed, invited, and celebrated. Besides the design of sidewalks and buildings, the HCDA should carefully plan elements to improve the beauty and liveliness of public spaces in the district.

Action MA9.1 Encourage active sidewalks and transparent building facades

Buildings and streetscapes that activate the environment, such as sidewalk cafes and parks, build community and stimulate the desire to walk to reach destinations. Transparent building facades with windows at street level create interest and also open up the pedestrian realm, so people are not forced to walk beside an imposing blank wall.

Action MA9.2 Make alleyways and other public spaces district-wide "programmable"

The District's alleyways and designated Local Streets are a resource that can be used to provide space for community activities while bringing energy and vitality to the public realm. Alleyways should be made available for activities such as farmer's markets, bazaars, food truck sites, street festivals, and other events in order to activate these spaces. When alleys are built anew or altered as part of a development project, they should be designed specifically to accommodate these types of uses.

Children enjoying a public promenade (Burlington, VT)
Image from Nelson\Nygaard

Action MA9.3 Provide street trees, weather protection, and other amenities

Providing a range of amenities such as seating, public art, landscaping, pedestrian-scale lighting, and protection from the elements can help create an inviting and comfortable space where people can stop and linger. Amenities may include:

- **Public Art.** Integrate public art where feasible to enhance people's journeys, to bring a sense of liveliness to public space, and to express the unique character or cultural history of a place.
- **Lighting.** Place pedestrian-scale lighting in areas with high pedestrian volumes, retail and commercial corridors, and elevated transit corridors.
- **Street trees and landscaping.** Use street trees and landscaping to offer shade, improve air quality, alleviate heat island effects, provide natural stormwater management; and create a visual buffer between the roadway and the sidewalk, providing a sense of enclosure and comfort for pedestrians.

- **Other amenities.** In very high-volume pedestrian areas, dedicate public space to amenities such as restrooms, drinking fountains, food vendors, and others as appropriate to the context.

Active use of an urban alleyway in Boston.
Image from Nelson\Nygaard

RULE CHANGES FOR KAKA`AKO

The following additions or modifications to the rules for pedestrian quality will govern new development:

- **Regulation MA6.1:** On commercial or mixed-use corridors, buildings are required to have entry points every 60 feet so that pedestrians have numerous opportunities to interact with semi-public spaces.
- **Regulation MA6.2:** Amend §15-217-63-B to encourage street life and to make sure shared parking is viable, parking garages are required to have pedestrian entrances and exits to the street.
- **Regulation MA7.1:** Per §15-217-63-B-1 and 2, parking garage access points must be oriented toward side streets or alleys (Local Streets) to reduce conflict between cars and pedestrians on busy streets.
- **Regulation MA7.2:** In commercial and mixed-use corridors, buildings are required to have at least 70% transparency for ground level frontages to create visual interest for people walking along commercial or mixed-use corridors per §15-217-55-M-6.
- **Regulation MA7.3:** Per §15-217-55-M-6, buildings are required to locate primary entrances along front façades, and locate loading docks or service entries off of street-facing façades.
- **Regulation MA8.1:** Amend §15-217-63-C to define maximum driveway density. Curb cuts and parking garages portals should be restricted to one every tenth of a mile (rounding down). This means some block will not include driveways. Parking garage entrances must be located at the rear or side of buildings accessible by Local Streets (per Chapter 6).
- **Regulation MA8.2:** §15-217-63-C-2 should be revised so that residential curb cuts may be no more than 10 feet wide per lane (two lane maximum at 20 feet) and 12 feet wide per lane (two lane maximum at 24 feet) for commercial curb cuts. This is intended to minimize the impacts to the pedestrian realm and to create more consistent walking paths.
- **Regulation MA8.3:** Amend §15-217-63-I to state that surface parking lots must be screened along the street with landscaping or architectural elements to reduce their visual impact.
- **Regulation MA9.1:** Amend §15-217-39-D-1-7 to include placements standards for bike parking in Figures PZ.1 though PZ.7
- **Regulation MA9.2:** In §15-217-39-D-1-7, change Figures 1.14 (pedestrian zone treatment) and 1.15 (pedestrian zone fixtures) to include acceptable applications, dimensions of bike share stations in the furniture zone and in the frontage zone where property owners integrate bike share stations into the design of setbacks.
- **Regulation MA9.3:** Amend §15-217-63-I to state that multi-story parking in active retail or commercial areas must be wrapped in active uses such as retail to screen parking from the street and to increase street-level activity.

TRANSIT

Transit Circulation

The Role of Transit

The City and County Honolulu operates one of the most highly used (per capita) public bus systems of any city in the nation. The City/County seeks to improve public transit by increasing reliability, decreasing travel times, and ensuring rider safety and comfort along all legs of the journey, although like many transit providers budget challenges prevent service from reaching optimal levels. HCDA can continue to advance its status as a transit-rich district by working with the Department of Transportation Services (DTS) to ensure streets operate efficiently for transit, that passenger access to transit is excellent, and by advocating for greater investment in regional transit.

The most important improvement in regional transit currently underway is the development of the HART rapid transit line, which will have three stations in the KCDD. These stations will provide a previously unattainable level of connectivity and convenience in travel for those moving between KCDD and many other parts of the Honolulu metro area. A key goal of this plan is to ensure that value of the new HART stations in Kaka`ako will be optimized toward the end of creating the vibrant, culturally rich, and walkable urban neighborhoods desired by the community.

High-quality public transit can lead to greater social integration and mobility choice for members of the community who are unable or prefer not to drive. It can provide increased access to quality employment, educational opportunities, social opportunities and the many natural and cultural resources of the Honolulu area. Using public transit can save money for riders to spend on housing, education, and other essentials. Public transit vehicles produce fewer GHG emissions than auto trips, making it an important contributor to achieving Honolulu's environmental sustainability goals and ensuring that lands remain available for civic and cultural amenities.

The Transit Network

As the City and County of Honolulu continues to enhance public transit, it will be important to coordinate these investments with improvements in street design, establishing clear priority for transit on important routes. Some transit routes are more important than others, and different types of service require different strategies for integration with other modes. Designing streets to be sensitive to the needs of transit will require HCDA to develop clear, site-specific guidance for the different routes throughout KCDD.

Figure 5-11 illustrates streets where it is critical to consider transit operations in the design and allocation of right-of-way. The dark blue, or primary, corridors are those that carry high-frequency bus service and where dedicated rights-of-way or higher levels of investment in intersection priority treatments may be needed.

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Figure 5-11 Transit Priority Streets

The introduction of rapid transit to the KCDD will significantly change the dynamic for access to the district and mobility between the district and adjacent areas on the line. Figure 5-12 illustrates the approximate walk time to a HART station from different parts of the district. It also shows how new street and pedestrian connections proposed in this plan extend the amount of people and places within a 15 minute walk of a future HART station. This analysis uses a network approach to mapping the shortest possible walk to a station using the grid of streets and pedestrian ways, not simply the "as the crow flies" distance, which does not realistically represent how people move through urban space.

Figure 5-12 HART Rapid Transit Stations and Approximate Network Walk Times

The following strategies are recommended to ensure that transit investments are optimized to meet the KCDD vision.

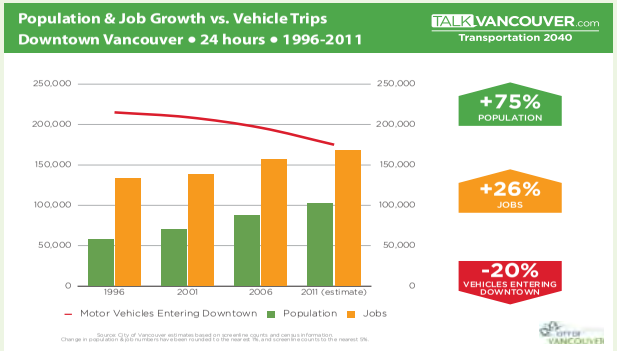
Strategy MA10 Maximize the value of HART rapid transit by providing high quality access to the line/stations

HCDA will continue to work with HART on station access strategies that maximize ridership and total transit revenue, including parking pricing programs that ensure a few spaces are available to passengers at all times, shared parking, and access programs that deliver more riders at less cost than parking, such as feeder buses and new development.

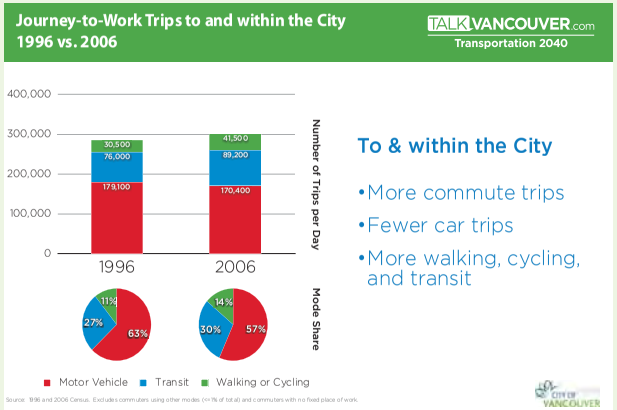
A number of additional strategies for managing auto traffic demand and increasing transit use are detailed in Chapter 8 – Parking and Transportation Demand Management.

Excellent regional rapid transit and quality urban design have allowed neighborhoods in Downtown Vancouver, B.C. to double their populations and create Thriving business districts while decreasing total auto trips.
Image from Nelson\Nygaard

RAPID TRANSIT KEY TO WALKABLE URBAN DISTRICTS



Between 1996 and 2011 the population of Downtown Vancouver grew 75%; during the same period vehicles entering the downtown dropped by 75% due to increased use of transit as well as walking and biking.
Source: City of Vancouver, B.C.



This graphic from Vancouver's 2040 Transportation Plan shows a demonstrable increase in walking trips created by the development of mixed-use urban neighborhoods where residents can walk to transit and all their daily retail and service needs.
Source: City of Vancouver, B.C.

Action MA10.1 Continue to collaborate with regional transit partners to ensure transit stops, stations and facilities are designed to ensure seamless transitions between transit modes and quality pedestrian-oriented places. This should include incorporation of guidelines for passenger facilities.

The influence of transit facilities does not stop at a station platform or bus stop. Systematically integrating facility design guidelines is a critical exercise for improving the quality of transit access and building transit-oriented neighborhoods. Transit facilities represent the public's interface with transit service in the KCDD; incorporating elements of thoughtful design to improve the transit experience sends the message that transit is a priority. Likewise, transit facilities are loci of intermodal connections, thus facility design plays a critical role in ensuring transfers are seamless and effortless.

Placemaking should be integrated into every design choice to ensure the transit experience is synonymous with navigating through great places. Transit facilities in the KCDD should create a safe, comfortable, inviting, and interesting space at each trip end. Transit facilities and their surrounding environs should be thought of as urban living rooms that fully integrate land use and urban design, encouraging people to stay.

Design guidelines provide the values and strategic vision for multimodal investment in transit environments. As the Honolulu transit network develops and matures, transit facilities must represent the needs of all transit users. Whether it is a transfer to another mode or route, or a last-mile connection on foot or by bicycle, transit facilities must ensure these movements are clear, tactile, secure, and protected from the weather. Chapter 7 provides detailed actions and regulatory changes that support:

- Creating seamless transitions between pedestrian, bicycle, and transit modes
- Providing clear, simple, and universal wayfinding and passenger information
- Creating highly-functional legible places around transit
- Ensuring spatial dynamics around transit stations create comfortable, not crowded, places
- Applying principles of Universal Design to make sure transit is accessible to all
- Focusing on passenger comfort at and around transit stations
- Ensuring transit stations and places are safe and comfortable at all times of day.

Action MA10.2 Fund and implement a Downtown/Kaka`ako/Ala Moana circulator that enhances access to HART stations and key KCDD destinations and those in adjacent districts

While the KCDD has excellent local and regional bus service at its perimeter, parts of the district have limited transit service, such as the makai side of Ala Moana Boulevard. HCDA should pursue the funding of a district circulator route designed to connect major destinations in the KCDD, future HART stations, major bus transit centers (Hotel Street and Punchbowl and King) and adjacent districts such as Ala Moana.

While the HART alignment will create new opportunities for circulation between Kaka`ako neighborhoods, Downtown and Ala Moana, the implementation of rapid transit is likely to increase, not decrease, the need for local transit circulation in the area. HART will bring thousands of additional transit passengers each day to the four stations between Downtown and Ala Moana, including the KCDD stations. Regional passengers arriving at these stations will seek last mile solutions to reach their final destinations, many of which will be more than a comfortable walking distance from the station.

Figure 5-13 shows a proposed route for a KCDD district circulator. The district circulator could expand its relevance if linked with a circulator connection between Ala Moana and Waikiki.

Developing a stable funding source to operate such a shuttle would be a potential challenge given stretched budgets at DTS. Other cities use local improvement districts, business districts, sale of advertising, station sponsorships, parking revenues, private business contributions and fares as funding mechanisms to operate downtown or district circulators. Future on-street parking revenue (see recommendations in Chapter 8) could be explored as a source of operating revenue for a local circulator.

Figure 5-13 Local Circulator Options

Action MA10.3 Develop a longer-term plan for a higher capacity street-level circulator system

Figure 5-13 shows a potential streetcar circulator route that would connect key KCDD destinations and neighborhoods with Downtown, the Civic Center, Ala Moana, and potentially with Waikiki. As stated above, introduction of rapid transit in Kaka`ako and adjoining districts is likely to increase overall demand for bus and surface transit, as more people come to the area without a personal

vehicle. New, compact and mixed-use development will create significant demand for short circulation trips, particularly as local services such as grocery stores come on line to support an increased residential population.

Pending the results of the Waikiki Regional Circulator Study (results not available at time of writing of this draft), HCDA should consider opportunities to extend or connect to the preferred mode and alignment of that study. This might require further study to determine how to accommodate transit on local streets, to integrate operations, and to develop a viable capital and operating plan.

Today there are privately operated trolley bus circulators operating in Downtown, Ala Moana, and Waikiki that carry close to one million passengers annually, even though they run limited hours.[1] These services are largely designed for and almost exclusively used by tourists. Fare options and stops are designed to cater to visitors making leisure tours of urban Honolulu. TheBus routes operating in the central area of Honolulu are more common means of circulation for local residents and workers (as well as more intrepid visitors). However, many local buses are highly crowded, particularly between Waikiki and Downtown where longer regional trips overlap with the need for short-distance circulation.

Several other U.S. cities have added local streetcar circulators in downtown areas to help address need for local circulation trips, reduce demand on regional systems, and improve last mile connections to regional rapid or high capacity transit stations. For example, the Portland Streetcar carries 4 million annual passengers on a route system that previously had no bus transit and that serves two of the city's major master planned neighborhoods – the Pearl District and South Waterfront. As a point of comparison, both districts have allowable floor area ratios within 3 blocks of the alignment that are lower than those allowed by the existing Mauka area rules.

Implementation of a streetcar would require additional study of routing options, capital costs

1 Estimated based on Waikiki Trolley website information regarding historic ridership.

LOS ANGELES DASH DOWNTOWN CIRCULATOR

Los Angeles DOT operates a system of local bus circulators, with five routes operating in the downtown area at 15 minute headways during the day and early evening hours (6 am to 7 pm). The DASH system includes a number of other routes operating in neighborhoods and business districts around the City. In all, the system carries almost 7 million passengers each year. The downtown routes are among the highest ridership routes in the system. The City is currently developing a modern streetcar route that would replace part of the DASH system with a high frequency rail circulator.

The planned Los Angeles Downtown Streetcar would connect South Park, the Fashion District, the Jewelry District, the Historic Downtown, Bunker Hill and the Civic Center as well as making ties to the Red/Purple, Blue, Gold, and Expo regional rail lines.

Figure 5-14 Roadway and Intersection Treatments for Transit Reliability

HCDA and the City and County of Honolulu will work to implement some of the following transit reliability measures on transit streets like Kapiolani Boulevard, Punchbowl Street, South Street, and Queen Street.

ROADWAY TREATMENTS

Transit Signal Priority (TSP)

Definition

At traffic signals, buses communicate with the traffic signal system to provide a green signal indication to an approaching bus. Delay for buses may be reduced at intersections as a result.

Constraints / Applicability

Less effective when signals are operating at capacity (i.e., Ala Moana Blvd.).

Effectiveness

Up to 10% reduction in signal delay.

Queue Jump Lanes

Definition

At signalized intersections, a bus is provided with a lane, adjacent to general-purpose traffic, and an advanced green signal indication to bypass congested areas. Buses "jump" the queue of waiting cars.

Constraints / Applicability

Lane must be as long as the typical queues.

TSP makes these much more effective, particularly if there is no far-side receiving lane.

May increase pedestrian crossing times.

Effectiveness

5-25% reduction in travel times at a signal.

Dedicated Bus Lanes (Business Access and Transit or BAT Lanes)

Definition

A lane is reserved for exclusive use by buses. It may also be used for general-purpose traffic right-turn movements onto cross streets and for access to adjacent properties. This treatment would speed bus travel times.

Constraints / Applicability

Conflicts with right-turn and delivery vehicles.

Often opposition from businesses that may lose on-street parking.

Effectiveness

5-25% reduction in travel times.

Note: The measures of effectiveness are derived from data found in the Transit Capacity Quality of Service Manual, unless a specific local measure is cited.

ROADWAY TREATMENTS (continued)

Limited or Time Prohibited General Public (GP) Turning Movements:

Definition

GP turning movements are restricted at all times or during peak periods. May be implemented with queue jump or dedicated bus curb lanes.

Constraints / Applicability

Impacts on other roadways from diversion of GP traffic/ turning movements.

Effectiveness

Highly effective means to implement peak period queue jump lanes or transit only lanes.

Innovative Bus-Bike Treatments

Definition

Treatments to provide bicycles with safe routes along high-volume transit corridors, manage bicycle-transit vehicle interactions, and allow bicycles to share transit lanes. Examples include shared lane markings, colored pavement, and bicycle-only signals.

Constraints / Applicability

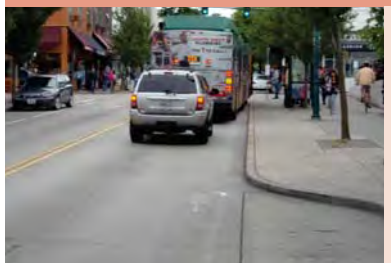
Highly contextual and must be considered within balance of person travel delay/benefit for specific street or corridor conditions.

Effectiveness

Difficult to measure impacts on transit, but can reduce transit delay on busy bicycle corridors and improve bicycling experience.

STOP TREATMENTS

Curb Extensions/ Bus Bulbs/Boarding Platforms



Definition

Sidewalks are extended into the street so that buses would stop in the lane of traffic. This prevents buses from getting trapped by passing vehicles, unable to return to the flow of traffic. The delays from merging back into lane may be minimized as a result.

Constraints

Only applicable where an on-street parking lane exists. Impacts to traffic flow must be taken into accounted.

Effectiveness

Depends on traffic. 8 seconds per stop is an average assumption.

Note: The measures of effectiveness are derived from data found in the Transit Capacity Quality of Service Manual, unless a specific local measure is cited.

New glass and steel transit shelters and covered bicycle facilities on the Portland Transit Mall provide weather protection while creating an open, inviting and safe pedestrian environment

PLACEMAKING: TURNING TRANSIT STREETS INTO ACTIVE ENVIRONMENTS

Increasing transit mode share to and through the KCDD will require building high-quality transit facilities that integrate seamlessly with the street environment. Along with the transit stop, the streetscapes that characterize transit priority streets are the user interface for transit. Thus, the importance of placemaking cannot be overstated. Urban placemaking for seven major center city nodes or intersections was the foundational element of the redesign of Portland's Downtown Transit Mall. The desire for 24-hour active streets that support retail and activities helped drive decisions to retain a general purpose traffic lane and to reduce bus volumes by routing key services perpendicular to the transit mall and to provide a high-frequency rail circulator. In addition to the transit priority features in place, Portland's Transit Mall incorporates wide sidewalks with distinctive paving, a variety of seating options, well-lit and covered bus and light rail stations, and public art. Similarly, Minneapolis' Nicollet Mall provides wide sidewalks with café seating, pedestrian lighting, park benches, and continuous retail activity.

Denver has taken a unique approach to designing a primary transit street. Sixteenth Street is a transit and pedestrian-only street that elevates the transit experience by turning the street into the destination. This mixed-use pedestrian street bisects the core of Denver's Center City and offers a bevy of street activity, restaurants, and cultural events. The 16th Street Mall FREE MallRide runs every two minutes during peak hours, allowing customers to look up the street and see a vehicle approaching at all times.

16th Street Mall in Denver
Image from Nelson\Nygaard

In each case, these linear transit corridors offer some level of tactility from increased accessible design and detectable warnings to textured pavement design and installation of brick pavers. As is the case in Minneapolis, Denver, and Portland, the most pedestrian-friendly corridors are synonymous with access to frequent transit service. Below is a list of components that transform transit corridors into great places:

- Active retail frontage
- Expansive sidewalks (in the range of 15 to 30 feet)
- Continuous and themed lighting schemes
- Pedestrian buffers such as trees and landscaping
- Space for café seating
- Coordinated public art program
- Curb extensions and pedestrian crossing features
- Level boarding features
- Enhanced bus shelters and stop amenities
- Wayfinding signage

Nicollet Mall in Minneapolis
Image from Nelson\Nygaard

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Passenger volumes on Queen Street overwhelm the existing sidewalk.
Image from Nelson\Nygaard

In Seattle, weather protection and seating for transit passengers was incorporated in the design of this building façade.
Image from Nelson\Nygaard

A well designed civic plaza has trees that provide shade for waiting transit passengers and is permeable to keep the pedestrian pathway clear.
Image from Nelson\Nygaard

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and funding, operating scenarios and methods for funding ongoing operations, traffic and transportation impacts and benefits, and integration with major developer master plans.

Strategy MA11 Support reliable bus operations in the KCDD

Action MA11.1 To the extent practical and based on funding availability, work with DTS to eliminate transit delay and improve transit reliability on regional and connecting transit streets through physical and policy improvements.

Transit priority treatments are relatively inexpensive improvements (when compared to major corridor transit projects) that reduce delay and increase speed of transit services. Effective transit priority treatments optimize management of city streets to increase transit speeds while minimizing impacts on other users of the street. This section describes some intersection and roadway treatments that can help to keep bus transit operating reliably, even as urban congestion increases. These tools should be considered in conjunction with other street design and operations considerations detailed in Chapter 6.

BUS PRIORITY LANE IN SYDNEY AUSTRALIA

Sydney, Australia applied a continuous red color overlay to bus lanes that were previously marked by pole-mounted "Bus Lane" signs and "Bus Lane" pavement markings. Surveys were conducted at three locations along the bus route after the red overlay was applied to the full lane. Results indicated that lane violations were reduced between 4% and 17%.

Image from Flickr user Scotticus

Like many U.S. cities, streetcars were a staple of local mobility in urban Honolulu until the 1930s. This scene shows a streetcar operating on King Street in 1925.
Image from Everyday Life in 20th Century Honolulu by Tiffany Hill, Michael Keany and A. Kam Napier in Honolulu Magazine

The Seattle South Lake Union Streetcar has been a key mobility component of the district's redevelopment. Private companies such as Amazon have contributed financially to its operation to increase service and provide employees and residents better connections to regional light rail and services in the adjacent downtown retail and entertainment districts.
Image from Nelson\Nygaard

Strategy MA12 Increase transit ridership for all types of trips

Action MA12.1 Around rapid transit stations and major bus transfer points, prioritize land uses and patterns that generate high transit ridership

With plans to more than double its residential population in just a few decades, the KCDD will need to focus on walkable, compact land uses to reduce vehicular travel demand. To gracefully accommodate planned growth, HCDA will need to carefully link land use planning and transportation system development. In particular, planners must agree that land use cannot be shaped by transportation, rather land use and urban form must be recognized as the most powerful tool for shaping people's decisions about where they live and how this affects their travel patterns.

The Vancouver, B.C. story is very instructive and worth telling. The sidebar describes Vancouver's unique success in coordinating transportation and land use.

Action MA12.2 Provide developer incentives to improve bus facilities adjacent to new development: Improvements could include new bus shelters, wider sidewalks, concrete bus pads, benches, changeable message signs, secure bike parking, bike-share stations (where appropriate), and trash receptacles.

Too often the development of high quality curb-side bus stops is ignored in the development review and developer negotiation process. In a dense urban district, the placement of bus facilities in the sidewalk space and the spatial planning and design for passenger queuing and pedestrian throughput is critical.

- Bus stops should be placed to assure customer convenience and provide for the safety of pedestrians and vehicles. Stops shall be visible, near crosswalks and well lit.
- Bus stops should be clearly and consistently identifiable with up-to-date information for riders about services at the bus stop.
- The design of bus stops should be sensitive to the community setting and where possible incorporate features that identify the stop with the community (such as art, bus stop naming or inclusion of a community bulletin board).
- Where reasonable, bus stops should be accessible and meet Americans with Disabilities Act (ADA) requirements.
- Bus stops should be located in support of institutions and with clients having special needs, large employers and community centers.
- Bus stops should be spaced to maximize the efficient operation of transit service while not requiring riders to walk more than a quarter mile to the bus stop.

Good bus stop design requires local jurisdictions, community partners, and land developers to work together in creating a functional and aesthetically pleasing deign.

TriMet, the public transit provider in the Portland Metro Region, has an excellent set of bus placement and design standards available on line: http://trimet.org/pdfs/publications/bus-stop-guidelines.pdf. Bus stop design will be specified when HCDA develops its Complete Streets Design Standards.

Action MA 12.3 Encourage schools and major employers to provide prepaid access on the TheBus and HART systems for all of their students and employees.

When an employer or institution purchases free transit passes for all employees—or when an employee or student ID card is also valid as a regional transit pass—the transit ridership impact is greater

COORDINATED LAND USE AND TRANSPORTATION PLANNING IN VANCOUVER, B.C.

The broad strokes of the so-called "Vancouver model" are well known to American planners: develop dense, mixed-use and walkable neighborhoods in and around downtown. Many of the details of Vancouver's approach to land use, however, are less understood—including the relationship between land use and transportation policy.

Vancouver's "Living First" policy, adopted in 1991 as part of the Central Area Plan, rezoned 8 million square feet of space from commercial to residential use; since the policy was implemented, the population of the downtown peninsula has risen from 47,000 to 88,000 (in the 2006 census). However, former planning director Larry Beasley has explained that the policy's success "is not just the result of favoring housing and changing the zoning to allow it to happen. Nor is it just the result of a vibrant market...The first principle has been to limit commuter access into downtown and let congestion be an ally in a household's profound first decision to live downtown or in the suburbs. Walking, biking, and transit get priority for both space and spending."*

The growth of the SkyTrain system has helped Vancouver's downtown peninsula—which is connected to the rest of the city only by a narrow bottleneck that might otherwise be choked with traffic—to remain a major civic and commercial center, with 10% growth in employment between 1991 and 2001, even as outlying areas have continued to grow. (Downtown growth may have mitigated suburban sprawl, but the entire region is growing rapidly.) The share of downtown trips made by car has remained relatively constant and even declined: from 46% of all trips in 1994, auto mode split had fallen to 40% by 1999 and continued to decline through 2011. In 1999, transit accounted for 28% of all trips and walking accounted for 31%.

With so much residential growth downtown, trips into and out of the core are increasingly less important than trips within the downtown peninsula. Morning peak trips entirely within downtown increased from 18% of all downtown trips in 1974 to 21% by 1996; these trips were expected to reach 27% by 2021. While trips to downtown destinations from outside downtown were expected to grow by 18% by 2021, trips within downtown were expected to grow by 64%.

To accommodate the continued growth of downtown, the city's 2002 Downtown Transportation Plan built on the 1997 City of Vancouver Transportation Plan, which made explicit the following hierarchy of transportation priorities: pedestrians, bicycling, transit, goods movement, and private automobiles. The 1997 plan also made clear that "(o)verall road capacity to the downtown will not be increased above the present level." In the 2002 plan, a "Pedestrians First" policy was established, and it was further noted that:

"Over the next 20 years, the total number of trips to downtown will grow by 30%. Some kinds of trips will increase more than others. Commuter trips on foot and bike are expected to double. Rush hour transit use will rise by 50 to 60%. Car and truck trips are projected to stay about the same."

The city has doubled the total length of bike lanes downtown, on top of a twofold increase between 1994 and 1999. It projected an 85% increase in transit trips within downtown during the morning rush hour, accommodated by local bus routes. It also projected that rail would accommodate 90% of all new non-walk and bike trips into downtown. The total number of commercial parking spaces per employee, meanwhile, was expected to drop from 0.44 in 1990 to 0.32 by 2021.

With congestion declining, the plan projected a 3% increase in average vehicle speeds, with average transit speeds increasing by 14%.

Criticisms of Vancouver's downtown transportation policy have focused on its land use policy: with housing prioritized over offices and limited remaining space for commercial growth, downtown is becoming something of a "bedroom community" with increasing numbers of commute trips from downtown to outlying jobs.

Since the 2002 plan, the city has taken additional steps toward a sustainable long-term transportation policy. In 2006, the South Coast British Columbia Transportation Authority, or TransLink, implemented a parking tax on all non-residential properties of $0.78 per square meter (since repealed). A "demonstration" streetcar line between the Olympic Village Canada Line subway station and the popular Granville Island shopping area opened in time for the 2010 Winter Olympics; it is the first phase of a greater downtown network. The Canada Line, the latest installment of TransLink's driverless metro system, opened between the airport and downtown just before the Olympic Games. The Olympic Village area itself is now being redeveloped into a neighborhood and will be the first community in Canada to offer car-share vehicles throughout its entirety. The Southeast False Creek Plan forecasts that 60% of all trips in the area will be made without a car and that the neighborhood will generate 25 to 50% less greenhouse gas emissions than similar urban districts.

* "Living First" in Vancouver, American Planning Association's Zoning News April 2000

than merely providing free or discount passes to regular transit users. Pass programs available to all employees encourage those who have never taken transit to try it, and this way, they may become regular riders. To be most effective, transit passes should cover both TheBus and future rapid transit service. Such transit pass programs have been shown to reduce employee commute trips by 5 to 10 percent or more and can be adopted for residential buildings or neighborhoods.

Universal transit passes could be provided to residential developments or neighborhoods through resident associations or assessments. Examples of places this has been implemented include Santa Clara, California and Boulder, Colorado.

More detail on these strategies is included in Chapter 8.

RULE CHANGES FOR KAKA`AKO

HCDA does not have a direct role in delivering transit services or designing street rights-of-way to accommodate transit operations and passenger loading. However, as the KCDD redevelops, HCDA and its local developer partners will work closely with TheBus (City/County) and HART to ensure transit access and operational considerations are addressed early and throughout the development review process.

- **Regulation MA12.1:** Require developers to construct transit passenger facilities on public right of way where designated/or where there is an existing stop that will require replacement as new public facilities are constructed.

UNIVERSITY OF HAWAI`I AT MANOA, SEATTLE, AND BOULDER UNIVERSAL TRANSIT PASS PROGRAMS

The UPass is a University-issued bus pass available to enrolled students at UH Manoa on a semester basis. UH Manoa has plans to expand the successful UPass program to employees starting in 2013. HCDA will coordinate with the City and County of Honolulu to establish a similar district based pass program. Employer, district, and institutional UPass programs have proven to be very effective at reducing vehicle trips. For example, the University of Colorado at Boulder instituted free ridership for students, faculty, and staff in 1991. Between 1991 and 1998, ridership increased a marked 400%. In Seattle, the Downtown Seattle Association buys bulk passes from the transit agency at a discount and provides small employers an opportunity to purchase an unlimited ride pass for all their employees at a significant discount. Unlimited access transit pass programs are estimated to reduce vehicle trips (in VMT) up to 15% on average.

Image from Nelson\Nygaard

BICYCLE

Bicycle (Routes and Facilities)

The Bicycle Network

The flat terrain, short distances between destinations, and mild climate of Kaka`ako are ideal to make cycling a healthy, convenient and pleasant way to meet everyday transportation needs in the district and surrounding neighborhoods for residents and visitors of all ages and abilities.

Many people already bicycle in Honolulu for recreational and utilitarian purposes. An active and passionate cycling community has emerged, increasingly reminding decision makers that there is more to be done to improve connections, create a safer environment and increase cycling as an alternative to driving. HCDA is a strong supporter of an improved cycling environment and has been active in this conversation.

Cycling Supports HCDA's TOD Overlay Plan Vision

Bicycling has a clear role to play in achieving the goals of the TOD Overlay Plan; new development can be gracefully accommodated by ensuring residents and workers have a broad range of mobility options including spatially efficient modes such as biking and walking. An increased rate of bicycling can help ease congestion, free up auto parking capacity and reduce air pollution and noise levels. Bicycles are a tried and tested, simple, cheap and zero-emission technology.

A desired outcome of the HCDA TOD Overlay Plan is to make Kaka`ako the most bicycle friendly district in Honolulu.

Strategy MA13 Create a complete network of high-quality bicycle facilities, including a minimum of one new mauka - makai and one Ewa - Diamond Head protected bicycle facility, with the aim of increasing the number of people who use bicycles for everyday transportation

Providing efficient mobility and access is a key challenge for the HCDA in realizing its goals to develop a compact, walkable, vibrant urban district that is well connected to adjacent districts. Cycling can play a key role in ensuring that short- and mid-distant trips are made by spatially efficient and environmentally friendly means.

Action MA13.1 Develop a complete network of cycling facilities in KCDD, including at least one Ewa – Diamond Head and one mauka – makai direction protected bicycling facility (see Figure 5-15)

A top priority for KCDD is the development of high-quality bicycle facilities that allow residents, workers and visitors to travel to and through Kaka`ako safely and comfortably. The HCDA should work with the City/County of Honolulu DTS to implement a complete network of bicycle facilities.

Figure 5-15 illustrates where cycling facilities should be prioritized. Primary streets are those where fully separated facilities (i.e., cycle tracks or buffered bike lanes) or on-street bike lanes should be considered. Secondary streets are those that should be signed and marked for bicyclists, but where cyclists would share the lane with traffic. Low speed streets are those that have design features

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Cycling is a normal part of daily like in Copenhagen, CK, and helped make the city one of the most livable in the world.
Image from Nelson\Nygaard

CYCLING SUPPORTS THE KCDD VISION

- Connects People with Destinations. Planned facilities connect the KCDD and neighboring commercial districts, schools, and recreational amenities, facilitating resident and visitor access to daily needs and destinations. In the strategic areas near transit where new complete mixed-use neighborhoods are encouraged, bicycle facilities are introduced and enhanced to encourage access for all. New mauka-makai and Ewa – Diamond Head backbone connections tie the KCDD to the City.
- Supports Bicycling as an Alternative to Driving. For many trips, the bicycle provides more convenient access than a car, often allowing you to park closer to your destination, bypass congested intersections and arrive in a timely manner. Most of the KCDD can be reached within a ten minute ride as can many neighboring districts and destinations.
- Improves District Streets. District streets are great places for bicycling, and improvements like sharrows, bike lanes and calming features support the slower local-serving character of the places along these streets. Increasing bicycling in the neighborhoods encourages using the public streets as recreational and open space that encourages social interaction.
- Preserves and Enhances the KCDD's Community Character. Bicycles fit well with the KCDD's growing reputation as Honolulu's creative core and emerging home of environmental organizations. The TOD Overlay Plan recommends innovative bicycling facilities and programs that encourage residents and visitors to celebrate Kaka`ako's history, beautiful climate and setting. Whether carrying a surfboard or a briefcase, the TOD Overlay Plan aims for all people to feel comfortable riding their bike in the KCDD.
- Balances Roadway Use. The TOD Overlay Plan recognizes that streets serve many roles and users. The bicycle is the most space-efficient personal mobility device, taking up a minimum of roadway and parking space. Introducing a network of varied bicycle routes, paths, lanes, cycletracks, and other facilities will encourages cyclists of all types, and roadway users of all modes, to share the road.
- Supports Transit Connections. The bicycle is a perfect "last mile" connection between other modes and destinations. For people using transit, bicycles are a great tool to get to and from the stop, expanding transit's effective reach throughout the City. Bikes can help motorists get to and from their parking spaces, expanding the reach of surplus parking locations. For pedestrians, bike-sharing facilities can bridge longer distances, allowing quick movements between different walking destinations.
- Capture Tourist Business. Few tourists chose a destination so they can use a car, but increasingly active tourism is an important consideration. Honolulu is among the most visited cities in the world, but relatively few visitors seek out destinations in Kaka`ako. Creating a district that is accessible and comfortable for cyclists and connected to places such as Waikiki and Aloha Tower with high quality facilities is a promising way to increase tourist traffic in the District.

which calm traffic and require motorists to drive at speeds that allow cyclists to easily integrate with traffic.

Figure 5-15 Cycling Priority Streets

While it may take many years to complete the cycling network illustrated in Figure 5-15, there are specific projects that the HCDA should consider prioritizing based on their importance in completing the network and coordination with upcoming projects.

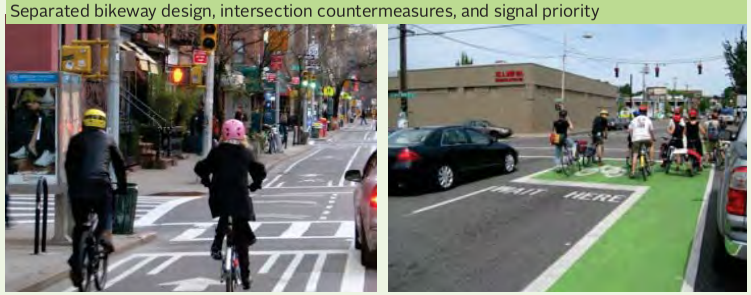
An active partnership with DTS and local bicycling groups will be needed to realize this plan.

WHAT ARE THE GLOBAL CYCLING LEADERS DOING?

Surging interest in bicycle transportation is sparking U.S. and North American transportation agencies to institute innovative bikeway designs, new and more effective programs, and monitoring technology that can help communicate the value of cycling investments. Looking to global cycling leaders can inform HCDA of potential opportunities to advance innovative infrastructure improvements in the KCDD. A sample of these leading practices are presented below.

Examples of Leading Cycling Practices And Trends

Separated bikeway design, intersection countermeasures, and signal priority



Cyclists in many great cycling cities are afforded priority signals and greater visibility at intersections as well as separation from motor vehicle traffic along key travel corridors.
Images from: Flickr user Kyle Gradinger (left) and Flickr user Cheryl & Rich (right)

Full service end-of-trip facilities and public bike share

Bikestations (left) offer cyclists a space to change and store their bikes and clothing. Bike sharing (right) provide bicycles on-demand to cover the last-mile connection for transit trips and support quick trips in dense locations.
Images from Bikestation® (left) and Nice Ride Minnesota (right)

Innovative education programs and promotional campaigns

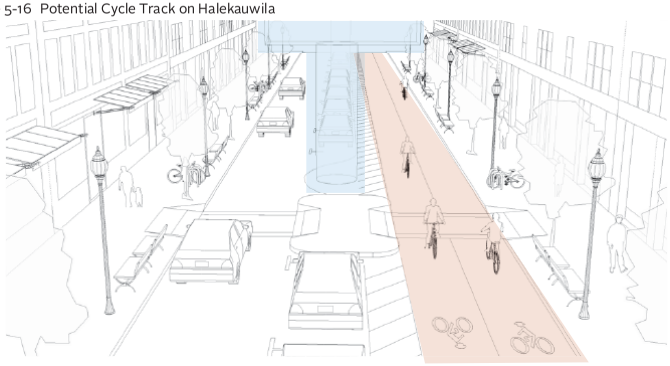
"What's your most ridiculous car trip?" campaign seeks to get people out of their cars for short trips in Malmo, Sweden.
Images from Green Citizens of Europe (left) and Flickr user Gary Leonard/CicLAvia (right)

Context sensitive solutions and design guidelines that ensure consistent bikeway design

An excerpt from the NACTO Urban Bikeway Design Guide (left) and Transport for London's approach to context specific cycling solutions in the suburbs (right).
Images from NACTO (left) and Transport for London (right)

DRAFT

Figure 5-16 Potential Cycle Track on Halekauwila

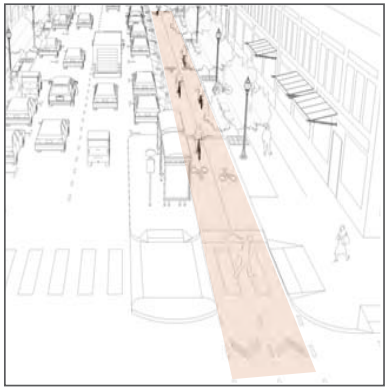


The guideway column for HART highlighted in blue in this illustration presents a concept for use of the HART guideway to create a shaded cycle track
Image from Nelson\Nygaard

- **Halekauwila Street cycle track:** The development of the rapid transit guideway Ewa-Diamond Head through the district presents an opportunity for dramatic transformation of this street. This relatively low traffic volume street will become a major mover of people through the district. Eliminating Ewa-bound traffic would allow for the development of a 2-way cycle track perfectly positioned to provide bike access to HART stations and with excellent shading from the sub (created by the guideway). Figure 5-16 provides an illustration of how the street could operate with one-way traffic, a center parking lane, and a protected two-way bicycle facility.
- **Ward Avenue bicycle lanes:** Ward Avenue provides a critical mauka-makai connection through the KCDD and given its modest traffic volumes is well positioned to be a pilot Complete Street redesign project for HCDA. A redesign of the street could include standard 6-foot bike lanes with on-street parking or protected bicycle lanes. Connections to the Kaka`ako station from mauka and makai could be supported by this facility.
- **Auahi/Pohukaina Streets shared lanes:** The proposed connection of Auahi to Pohukaina as part of the Howard Hughes development presents an opportunity to

For Ward Avenue, bike lanes like these on a commercial street in Santa Monica, CA could be implemented.
Image from City of Santa Monica

Shared lanes for Auahi/Pohukaina Streets could be similar to these green sharrow lanes on a commercial street in Long Beach, CA
Image from Dan Burden



For South/Punchbowl Streets, one-way or two-way cycle track design could be implemented.
Image from Nelson\Nygaard

create a pedestrian-oriented commercial street. This street would provide a secondary bicycle connection allowing local bike traffic to access retail and services from this corridor. A standard sharrow treatment and bicycle wayfinding signage would be appropriate for this corridor.

- **South/Punchbowl Streets protected bicycle lanes:** On the Ewa side of the KCDD, the South and Punchbowl couplet provides an opportunity for new bicycle facilities. Both streets are wide and could be redesigned to accommodate protected bike facilities in the major flow direction. Alternatively, South could be reconfigured to accommodate a two-way cycle track.

Each of these projects would require more detailed engineering and design review.

Other KCDD area bicycle facility projects included in the O`ahu Bike Plan, such as Ala Moana bicycle lanes, are supported by the TOD Overlay Plan.

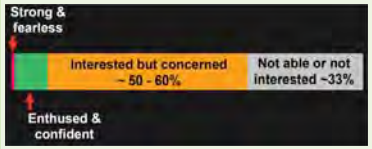
Action MA13.2 Promote HCDA as a cycling district

There is a small segment of the population in any city that will chose to cycle no matter the quality of the bicycle facilities, weather, or availability of parking and storage. Far more people fall into the category that has been named by bicycle planners as the "interested, but concerned." These are people that would like to bike more, but have reservations, fears, or uncertainties that keep them from cycling regularly (see sidebar).

HCDA can sponsor community cycling events that bring cycling into the mainstream and promote the KCDD as a hub for cycling and bicycle oriented businesses.

CYCLING MARKETS

Research in cities around North America and beyond shows that the majority of residents rate themselves as interested in cycling, but unlikely to cycle due to safety, weather concerns, or lack of quality bike storage and trip end facilities. This "interested but concerned" market should be the target for bike planners in Honolulu.



Approach developed by the City of Portland, OR

Bike friendly businesses in Long Beach receive stickers to show cyclists consumer benefits
Image from BikeableCommunities.org

BICYCLES FOR BUSINESS AND JOB CREATION

BUSINESS ACCESS

In the age of Amazon, urban storefront retailers are struggling. As people buy less from bricks and mortar establishments, retail spaces are increasingly occupied by lifestyle establishments – bakeries, coffee shops, flexible work spaces, independent specialty retailers, and places where people can congregate and find community lost in the age of internet retail. In bike friendly cities, like Portland, Vancouver, and Boulder, CO, retailers are finding that bike lanes and sufficient bike parking are a great way to bring people to their front doors. In Portland, developers are increasingly looking to build along bikeways, as small retailers and restaurateurs will pay a premium for that space.1

JOB CREATION

A study by the University of Massachusetts Political Economy Research Institute found that building bike lanes created more jobs than any other type of transportation investment — 11.4 to be exact for every $1 million spent on design, construction and materials. That compares to 10 jobs per $1 million spent for pedestrian projects and 7.8 jobs per $1 million for road-building projects.

A 2008 report on the affects of the cycling industry in Portland, OR estimated that cycling businesses bring $90 million in annual revenue to the local economy. The report only estimates direct bicycle-related business activity (gross revenues and incidental expenditures by event participants) in Portland, and does not include bicycle-related benefits to residents' health, traffic congestion, air quality, or quality of life.2

In Portland, these developers chose to build along one of the city's busiest bike lanes. Neither development provide parking (for cars) and both cater to bicycle friendly businesses and residents whose primary mobility choice is a bicycle. The residential building has bike parking on each floor and parking for large utility bikes and trailers.
Images from Nelson\Nygaard

1 http://greenlaneproject.org/blog/view/location-location-portland-retailers-swoop-into-storefronts-along-bikeways
2 http://www.altaplanning.com/App_Content/files/fp_docs/2008%20Portland%20Bicycle-Related%20Economy%20Report.pdf

KCDD as Bicycle Business District

As an emerging business district, the KCDD could develop a program to promote local businesses as bike friendly and accessible. Adaptive reuse projects such as the Salt Blocks could benefit from such a district designation that cements Kaka`ako as Honolulu's creative core.

Long Beach, California is emerging as a leading cycling city. It has invested heavily in cycling to meet health, environmental and economic development goals.

In June 2011, Long Beach launched its "Bike Saturdays" program to encourage people to shop by bike—the first of its kind in the U.S. The City of Long Beach worked with area businesses to develop four bicycle-friendly business districts that offer a discount to shoppers arriving by bike on Saturdays.

The initiative encourages local residents to take short trips by bike instead of car, and ensures that dollars are being kept in the local economy instead of driven out of the community and spent elsewhere.

The program is funded by a $72,000 grant from the Los Angeles County Department of Public Health through Project RENEW[1] (Renew Environments for Nutrition, Exercise, and Wellness).

Open Street Events

HCDA could work with community organizations to sponsor one or more annual open streets events in the KCDD. As described in the call-out below, such events help encourage walking and cycling by taking over space from autos and will promote the value of Complete Streets in Kaka`ako.

Action MA13.3 Work with local partners to develop a bike share system in Kaka`ako and adjacent districts of Honolulu

Miami's Deco Bike is one of the world's most successful warm weather bike share systems; it has the highest ridership per bike of any system in the U.S.
Image from Deco Bike

Providing publicly accessible bicycles around the KCDD and adjacent districts will give more people the opportunity to ride, even for just one trip leg. Public bike share bikes will encourage visitors to choose Honolulu and the KCDD over other destinations, and to feel welcome in the area without a car. Bike sharing will facilitate connections to rapid transit and bus transit and replace short auto trips to local retail.

HCDA and many other community partners share a goal to create a comprehensive system of bike share stations in visible, on-street and off-street locations dispersed throughout the District and the City. An early system in KCDD could include 20 or more stations and 150-200 bicycles and would be most effective combined with a city system that also served Aloha Tower, Downtown, Ala Moana Center, Waikiki, University of Hawai`i and Honolulu's many popular parks and beaches.

Providing helmets and transit subsidy incentives to new users to incentivize trial use of both bike sharing and transit should be explored.

Demand for Bikeshare

Successful bike share systems are dependent on a variety of factors including population and employment density, proximity to schools, colleges, universities, proximity to transit, availability of bicycle infrastructure, and proximity to tourist-based destinations. KCDD is well positioned to be a central destination in a future regional bike sharing system. Bike share also has potential to provide local mobility as the area grows and services and destinations diversify.

Bike sharing in Kaka`ako, and the broader urban Honolulu area, will attract a variety of riders making trips for many different purposes. Bike share programs in other U.S. cities, particularly those operating in warmer climates and cities with high levels of tourism, are instructive as to the likely users markets in Kaka`ako and Honolulu as a whole. The following are some key markets and considerations for where each will create demand for bike share stations:

1 Project RENEW is a 2-year grant funded from Federal American Recovery and Reinvestment Act in partnership with the Centers for Disease Control and Prevention. Project RENEW consists of 10 health-related initiatives in the Los Angeles area.

CicLAvia in Los Angeles, CA reconnects this auto-centric city to the street and offers perspective on bikeable distances.
Image from Flickr user Gary Leonard/CicLAvia

OPEN STREETS EVENTS

The open streets movement was founded largely in Bogota, Columbia when Ciclovia was established back in the 1960s. Ciclovia Bogata is held every Sunday; it closes over 100 km of city streets to cars and provides a network of open streets for pedestrians, cyclists, and all types of human-powered transportation modes. Open streets events invite and encourage people to enjoy the streets car-free, connect with new parts of the city, interact with neighbors and people from different walks of life, and try active modes of transportation in a safe environment. The community benefits from an environmental, economic, social, and cultural standpoint.

Modeled largely after Bogota's Ciclovia car-free Sunday movement, cities in the U.S.—from Tucson, Arizona to Baltimore, Maryland—are temporarily closing off city streets to encourage cyclists and pedestrians to enjoy the city's streets without the threat the of cars. Although open streets events are seen as costly due to road closures and police traffic control, studies show that the health, retail, and mode shift benefits outweighs the monetary cost. In May 2013, Kaka`ako will host its first open street event.

SUNDAY PARKWAYS, CITY OF PORTLAND, OREGON

Image from Nelson\Nygaard

Portland Sunday Parkways promotes healthy active living through a series of free events that open the city's streets to walkers, bikers, and roller skaters. The goal of this program is to significantly increase the community's awareness of active transportation, foster civic pride, and stimulate local retail sales.

Since 2008, the City of Portland has sponsored the events. One Sunday a month during the summer between 10 and 13 kilometres of streets in rotating neighborhoods are opened up for people, not cars. Sunday Parkways aims to reach a large cross section of the community by rotating the location of the event each Sunday. In 2011, over 100,000 people came out to enjoy Portland's streets.

Funding for Sunday Parkways originally came from a combination of City of Portland, Regional Travel Options funding from the Metro regional government, and donations from area businesses and organizations, such as local bike shops and health insurance providers. In recent years, the Sunday Parkways event has been so successful that the Metro Regional Travel Options program has expanded its funding to other jurisdictions in the Portland region.

CICLAVIA, LOS ANGELES, CALIFORNIA

CicLAvia began in 2010 and closes roughly 16 kilometres of Los Angeles' streets on several Sundays throughout the summer months. The most recent CicLAvia event attracted an estimated 130,000 participants, the majority being bicycle riders. CicLAvia is a non-profit organization whose mission is to encourage safe, vibrant public spaces, sustainable transportation, and public health through car-free street events.

Beyond the mission of opening the streets for active transportation, CicLAvia partners with area businesses and artists-that provide entertainment and programming along the route. In October 2011, the CicLAvia Walks initiative began, which allows participants to discover the many architectural, cultural, and culinary destinations along the route.

CicLAvia's events are funded by both private and public partners. Sixty percent of funding comes from individual and corporate donations; 40% of funding comes from the City of Los Angeles to cover traffic operations, sanitation, and public safety efforts. The event costs the City of Los Angeles roughly $219,000—under $2 per participant. The City supports the event largely because they see it as a transit ridership strategy as participants are encouraged to come via public transit. The goal of CicLAvia is to eventually spread and interconnect the region.

- **Tourists and visitors:** Station demand near hotels, points of attraction, recreational amenities, visitors services, and transit hubs
- **Residential customers:** Station demand near dense concentrations of housing, condo/apartment towers, transit hubs and stations
- **Workers and students:** Station demand on institutional campuses, large employment centers, downtown, and at transit hubs and stations
- **Local residents with limited transportation options:** Station demand along high frequency bus routes, retail and general employment centers, medical and social services opportunities, low-income housing and dense apartment concentrations

In Honolulu, significant and growing tourist and visitors populations have potential to generate high levels of year-round patronage for a bike share system. Trips originating in Kaka`ako are likely to be oriented to residential users, local workers making circulation trips, and commuters connecting to regional transit lines including future HART stations. Figure 5-17 presents a draft list of evaluation criteria that can be used for the purpose of determining initial areas to be served by a bike share system, where stations should be located, and to set targets that help determine when to expand the system.

Figure 5-17 Evaluation Criteria for Analyzing Bike Share Market Potential

Criteria	Bike Share Goals	Measures
Population, Employment, and Retail Density	Productivity, Mobility, Amenity	Higher score if located in a high density residential areas or employment center. Density of human activity matters most, but density of tourist oriented activities is of high importance. More activity will be generated from mixed land uses that generate trips throughout the day (i.e., university).
Proximity to rapid transit or other frequent transit service	Productivity, Mobility	Proximity to (for station a location within 200 yards from the entrance/exit of) a rapid transit stop or other frequent transit service bus stop. In many urban markets, proximity to long-haul transit stops is given a higher value as these customers are often seeking "last-mile" connections. In Honolulu, overcrowding on core urban bus routes should make bike sharing a competitive alternative for short urban trips as well as provide last mile connections.
Likely use by casual riders	Productivity, Revenue, Mobility	Higher score if more than 60% of trips are projected to be taken by casual subscribers (non-members). Proximity to local trip generators, retail, restaurant districts, institutions and other uses that create varied and occasional uses.
Prevalence of tourist/visitor destinations or lodging	Productivity, Revenue, Mobility, Amenity	Higher score for areas within 200 yards of a major tourist destination, recreational destination, or hotel.
Ability to serve low-income and/or transit dependent customers	Transportation system equity, Mobility	Higher score if 15% of neighborhood is below the federal poverty line OR 15% of residents fall below the median household income level. Rates of car ownership is also a measure of transit dependence.
Neighborhoods/areas underserved by transit	Transportation system equity, Mobility	Higher score for areas with poor transit level of service (greater than 30 minute frequency)
Neighborhoods/areas lacking basic services and amenities	Transportation system equity, Mobility	Higher score for areas with limited retail/commercial services within walking distance (minimum 1/4 mile)

Once key market areas are determined, more detailed analysis is needed to determine optimal station siting locations. Ultimately, station siting is a delicate balance between finding locations with available space (or developing them), matching sites with demand propensity (see above), balancing design

with local regulations, siting stations near quality bike facilities, and a host of other considerations. Figure 5-18 provides some important propensity-based station siting criteria and Figure 5-19 provides an interim understanding of which parts of the KCDD could support bike share stations. Additional iterations of analysis must be conducted using station siting criteria to understand the spatial needs bike share stations. Potential criteria could include sidewalk capacity, on-street parking bay availability, redevelopment opportunities, park/public space integration, and pedestrian junctures/intersection density.

If HCDA and/or its partners contract with a turnkey bike share operator, there is an opportunity to leverage further station citing analysis as part of the contract for services.

Figure 5-18 Criteria for Siting Bike Share Stations

Criteria	Bike share Goal	Measure
Bikeway/bike facility availability	Propensity	Higher scores for areas within 1/4 mile of a dedicated bicycle facility. Hierarchy of score based on class of facility (off-street path, cycle track, lane, share facility, etc.)
Low speed streets	Propensity	Higher scores for areas located along streets with posted speeds of 30 mph or less
Low volume streets	Propensity	Higher scores for areas located along streets with posted speeds of 30 mph or less
Job Housing Mix	Propensity	Higher scores for block faces that achieve URBEMIS' land use mix credit*
Topography	Propensity	Lower scores for areas with grades of 2 to 4% or higher
Sidewalk capacity	Spatial needs	Higher scores if sidewalk widths are greater than 15 feet (allowing for 6-8 feet station depths, 4 feet of clear zone, and 4+ feet of pedestrian through zone). These standards need to be balanced with adjacent land use forms and other user needs (e.g., a 4 foot pedestrian through zone is insufficient in high volume pedestrian areas)
On-street parking bay availability	Spatial needs	Higher scores if block faces have on-street parking with low peak demand (e.g. less than 40% occupancy) or with a convertible use (e.g., underutilized loading zone
Redevelopment opportunities	Spatial needs	Higher scores for block faces that are likely to redevelop allowing opportunity 'to integrate stations/amenities into setbacks without reducing sidewalk capacity
Park/public space integration	Spatial needs	Higher score if park space or public space (e.g. plaza at government building) could be used to site a station
Pedestrian junctures	Spatial needs	Higher scores for areas located near pedestrian connection points including intersection corners (with marked crossings preferably) and mid-block crossings

* URBEMIS is a tool for measuring air quality and transportation impacts of new developments (block level or district). It is being used to estimate trip generation impacts of development alternatives being evaluated in the KCDD TOD Plan.

Use Bike Share as an Economic Development Tool for KCDD

In addition to providing new mobility and access options, bike share can help achieve the KCDD's economic development objectives. A bike share system with stations in Waikiki, Ala Moana Center, Aloha Tower, and Downtown/Civic Center would put Kaka`ako at the nexus of many leisurely tourist trips. Combine with improved bicycle facilities and connections to regional greenway trails, bikeshare could present a powerful economic development tool, providing tourists and their spending power access to Kaka`ako and its emerging businesses.

FUTURE OF BIKE SHARING

In Copenhagen, a leading world cycling city, architects from RAFFA Architecture have developed a new bike sharing concept for the city of Copenhagen. The system features real-time GPS tracking, an online reservation system, and attractive bikes that can be stored anywhere. The new design takes on the challenge of limiting valuable urban space consumed by bike share and creating a highly attractive product designed to attract style conscious riders. This high-tech, space saving system is not being built, but is an example of the increased attention being given to cycling and public realm design.

All images from RAFFA Architecture

Bike share will likely be considered a value added amenity for prospective residents and employers looking to site their homes and businesses. For developers looking to attract customers interested in compact, transit-oriented, walkable communities, bike share is an added amenity.

Tying into the Bicycle Business District opportunity described in this chapter, bike share users could be given discounts to Kaka`ako businesses increasing the likelihood of one-time and long-term patronage.

Figure 5-19 Bike Share Propensity and Potential Generators

Roughly 95% of all beach-climate bike share use consists of tourist access via credit card

WARM WEATHER BEACH SYSTEMS

. . . TOURIST-BASED, IN A LIMITED NETWORK

- Miami Beach DecoBike
- Broward County B-Cycle
- Anaheim (pending)
- New Orleans (pending)
- Melbourne
- Long Beach DecoBike (NY)
- Manhattan Beach EcoTrip (CA)

- Miami Beach DecoBike
- Broward County B-Cyle
- Anaheim (pending)
- New Orleans (pending)
- Melbourne
- Long Beach DecoBike (NY)
- Manhattan Beach EcoTrip (CA)

WARM WEATHER BIKE SHARE SYSTEMS

Bike share is a particularly effective mobility tool for tourist-oriented, warm weather cities. In beach climate cities that have implemented bike share, over 90% of recorded use comes from visitors. Visitors tend to spend more time on bike share and be less sensitive to price and warm climate allow consistent year-round use, so financial stability for warm-weather systems is less of a concern.

Miami's system is one of the few privately operated bike share systems. Interestingly, DecoBike, the company that operates Miami's system has expanded to Surfside and Bay Harbor Florida and is soon to open in San Diego – all warm weather climates. This bodes well for a Honolulu system to be able to recover operating cost through rental revenues. Because the Miami system is able to cover operating costs with user revenue, it has provided the opportunity to use sponsorships and advertising to expand the system. Having opened with station spacing of 500 meters, the system is working to reduce spacing to a mere 200 meters, providing a much higher level of convenience and accessibility that most other US bike share systems.

The City of Miami has come to see bike share as a critical congestion alleviation strategy and has supported the system by investing in new bike lanes and on-street facilities where use is highest.

Bike share station locations in South Beach.
Image from DecoBike

WHERE HAS BIKE SHARING BEEN DONE?

NICE RIDE, MINNEAPOLIS, MINNESOTA

Minneapolis' bike share system, Nice Ride, has been a major success with over 100,000 trips in its first 6 months of operation—19% of which replaced auto trips. The system launched in June 10, 2010 with 65 stations and 700 bikes. Due to the popularity of the program, Nice Ride is currently expanding its station and bicycle unit network to 51 more stations and 500 more bicycles.

NiceRide MN docking station
Image from NiceRide MN

CAPITAL BIKESHARE, WASHINGTON, DC

Capital Bikeshare (CB) is a prime example how bike sharing can simultaneously complement transit and improve transit efficiency and overcrowding. Bikeshare members substantially reduced their use of Metrorail and bus since joining CB. Nearly half (47%) ride Metrorail less often and 39% ride a bus less often. Since the average trip was two miles, bike share catered to trips previously being made by transit. On the other hand, CB enabled multimodal trip-making as seven percent of members increased use of Metrorail and six percent increased bus use.

DecoBike docking station
Image from DecoBikes

DECOBIKE, MIAMI, FL

The Miami bike share system provided by DecoBike (DecoBike will soon operate bike share in San Diego) is a privately operated system, which started operations in Miami Beach. DecoBike features a network of 100 solar-powered bike rental & sharing stations with a fleet of 1,000 custom DecoBike accessible from dozens of locations. With 1,290,606 rides logged in 2012 alone, the Miami system is the busiest fleet per-bike of any US bikeshare program. Its success is due in part to warm year-round weather and high rate of tourism, two attributes shared with Honolulu.

Image from DecoBikes

Partner with Honolulu Bike Share Group

In order for bike share to successfully operate in Kaka`ako, any future system should operate and provide connectivity to adjacent districts in urban Honolulu. HCDA will partner with the Honolulu Bike Share Group to determine a preferred governance and funding structure, system feasibility, identify system sponsors, and integrate rules that accommodate bike share in Kaka`ako. A critical first step is to work with partners to identify an organizational, operating and funding structure that best matches local goals operating conditions, and funding opportunities.

While bike share as an amenity will help attract residential customers to the district, its greater value is to bring visitors, workers, and residents from elsewhere to emerging cultural amenities, restaurants, and activities in the KCDD. Creating a bike share network that connects many Honolulu neighborhoods and destinations benefits HCDA and the KCDD community.

Encourage Developers to Consider Bike Share in New Development

Bike share demand in Kaka`ako will vary dramatically based on land use types and land use intensity will fluctuate over time as the district redevelops. Setting up a development program that triggers investment in new stations when new buildings or developments come online is a necessary approach. HCDA should provide further incentives and requirements to ensure sufficient space is provided for bike share stations and to provide the opportunity for developer to integrate bike share stations into the design of their buildings and public spaces. This could come in the form of reduced permit fees and density bonus without additional parking requirements.'

Encouraging new development to incorporate bike share and even fund capital purchases of equipment will help reduce the cost of system development and ensure that bike share is not consuming valuable space in the public rights-of-way.

Action MA13.4 Improve access to bicycle parking and require new development to include bicycle storage

Every bicycle trip begins and ends with parking. It is important to provide easy to use, secure, and convenient parking that is visible and close to popular destinations. Secure parking with commuter amenities (such as shower facilities) are also needed near transit stations and employment centers. Although bicycle parking is already required in the Mauka area rules, the three KCDD HART stations and all new parking facilities should include long-term secure bicycle parking, and where possible, air pumps and repair stands should be provided with bicycle parking at these major facilities.

Standard staple or U-racks on a commercial street are aligned to provide clear path for pedestrians.
Image from Nelson\Nygaard

The number and location of bike parking spaces should be enough to meet observed needs, or to accommodate a shift of 15-25% from current auto parking rates, whichever is greater. As necessary, HCDA should retrofit auto parking facilities and commercial areas to meet bicycle parking needs. HCDA should develop a program that helps to fund installation of basic bike parking and to honor cyclist and merchant requests for rack installations whenever possible.

Private property developers and new KCDD projects should be required to build bicycle parking. Bicycle parking and facility requirements should be revised and enhanced.

Create a Process to Allow On-Street Bike Corrals

Bicycle corrals remove one to two on-street auto parking bays in exchange for 6-12 bicycle racks that can park between 12 and 24 bicycles.

A standard bike corral located to provide cyclist easy access to a local restaurant
Image from Nelson\Nygaard

Anecdotal evidence suggests that ample bicycle parking is good for business. A 2010 Portland study concluded that businesses close to bicycle corrals perceive that their customers are increasingly arriving by bike.[2] This study reported that 84% of businesses with a bicycle corral in front of their business reported that the bicycle corral enhanced the street. Surveyed business owners reported that an estimated 25% of their customers were arriving by bike.[3] Moreover, a long waiting list for bicycle corrals in Portland suggests that these corrals are in high demand and desired by businesses. The City of Vancouver, B.C. has installed a pilot bike corral with plans to expand the program.

Since 2004, the City of Portland has offered an on-street bicycle parking corral program where local businesses apply for the City to install a bicycle corral in front of their business. To date, this program has installed almost 100 bicycle corrals across the city to accommodate the growing demand for bicycle parking.

HCDA should work with the City and County of Honolulu DTS to establish a business-supported program for permitting bicycle corrals. The program could be business-initiated and should require buy-in from the major businesses fronting a block face. An application process should be established and a fee could be established to help offset costs. (The City of Portland application can be viewed at: http://www.portlandoregon.gov/transportation/34813?a=270766).

Action MA13.5 Work with the City and County to fund and construct the Kaka`ako element of the citywide bicycle network (O`ahu Bicycle Plan)

HCDA's ability to make Kaka`ako a bike friendly area is interdependent with the rest of the city. A great cycling environment allows users to go most places, at most times of day without concern for safety or comfort. A commuter may chose not to bike to work if she knows that her midday trip to the doctor is not on a cycling route that is safe and comfortable.

As HCDA works to develop complete, bicycle friendly streets within its District, it can also advocate for and partner with DTS and other local groups to make urban Honolulu a great place to cycle.

Strategy MA14 Create a safe, comfortable cycling environment in Kaka`ako through facility design and public education

Action MA14.1 Create a destination-oriented bikeway signage and wayfinding system to direct riders to bikeways and major destinations such as hospitals, schools, shopping districts, bike parking, and bike share/rental and repair locations

2 Drew Meisel, "Bike Corrals: Local Business Impacts, Benefits, and Attitudes," (Portland: Portland State University School of Urban Studies and Planning, 2010).
3 Ibid

A successful cycling system is one that is easy and straightforward to navigate. Wayfinding is a critical strategy to help orient cyclists unfamiliar with an area to the safest bicycle access routes and amenities, such as bicycle parking, showers, locker facilities, and other amenities. District wayfinding is addressed in the street connectivity section of this chapter.

HCDA could require developers to include bicycle wayfinding when development parcels are large enough to require internal circulation streets or pedestrian ways. Wayfinding should direct cyclist to bicycle parking, nearby on-street bicycle facilities, and regional multi-use trails.

Action MA14.2 Fund, construct and ensure operation of bicycle-transit centers at rapid transit stations (e.g., Bikestation model), which provide amenities such as secure bike parking, bike repair, and transit information

In addition to installing a variety of bicycle parking types for different time requirements, several major U.S. cities have located full service bike stations at or near transit hubs. The non-profit organization, Bikestation®, operates seven locations. Full service bike stations include bike parking, maintenance and repairs, education centers (at select locations), retail shops, showers, lockers, and changing rooms. According to recent before-after evaluations, bike stations have proven to be effective at shifting motorists to cycling. An average of 33%, and up to 65%, of Bikestation® members who previously drove are now using the Bikestation® facility for the same trip.[4] Instead of simply creating a bike storage room, bike cage, or short-term bike rack, these facilities are successful because they also provide value-added services, such as tire repair and tune-ups, geared toward new riders.

Interior and exterior of a Bikestation® in Washington DC
Image from Bikestation®

Likewise, transit agencies are now realizing the bike station concept's value added to the transit experience. Bay Area Rapid Transit in the San Francisco Bay Area owns and operates four bike stations, including the second largest of its kind in the nation.

Bicyclists accessing Kaka`ako station areas will be offered world class end-of-trip amenities. Offering high caliber end-of-trip amenities will not only increase bicycling rates, but also draw people and business to Kaka`ako. HCDA should work with HART during the design process for the Downtown, Civic Center, and Kaka`ako rapid transit stations to incorporate an enclosed, full service bicycle center.

4 Email correspondence with Andrea White-Kjoss, Executive Director of Bikestation®.

RULE CHANGES FOR KAKA`AKO

- **Regulation MA13.1:** New residential developments: secure, well-lit, visible, indoor ground-floor or below-grade bicycle parking for residents, as well as secure bicycle parking for guests.
- **Regulation MA13.2:** New non-residential development: secure, well-lit, visible, indoor ground-floor or below-grade bicycle parking for employees, ground-floor or below-grade commuter change room with showers and lockers; secure bicycle parking for visitors; prohibit building restrictions on bringing bicycles into buildings.
- **Regulation MA13.3:** Bike parking should be provided at a rate that accommodates a 10% mode share for the building.
- **Regulation MA13.4:** Encourage inclusion of lockers and showers

  All new mixed use and commercial developments above 500,000 square feet should require lockers and showers in the buildings' design. The proposed requirement is as follows:

  – At least 500,000 sq. ft = 4 showers/15 lockers
  – At least 750,000 sq. ft = 5 showers/22 lockers
  – At least 1,000,000 sq. ft = 6 showers/30 lockers
  – At least 1,250,000 sq. ft = 7 showers/37 lockers
  – At least 1,500,000 sq. ft = 8 showers/45 lockers
- **Regulation MA13.5:** Incent inclusion of bike share facilities

The potential for significant new development in the KCDD provides excellent opportunity to design streets, private building exterior spaces, and parking areas to effectively accommodate the spatial requirements of a bike share station. HCDA should build into Mauka/Makai Rules development incentives, reduced permitting fees, and additional TDM related incentives as a reward for establishing public benefits. Mauka/Makai Rules also need to integrate the spatial needs of bike stations into their pedestrian design standards (established in Figures PZ1-7 and FT1-12).

- **Regulation MA13.6:** Amend the Mauka/Makai sign code rules to allow for bike share advertising.

  Advertising will likely figure as a key revenue source that sustains bike share operations. The existing sign code needs to tolerate this type of signage while balancing the parameters for sign size and placement to ensure the public realm remains attractive.
- **Regulation MA14.1:** Require bicycle wayfinding signage

  As part of the district specific multimodal wayfinding with consistent branding, all bikeways and that the routes that lead into them should be furnished with wayfinding signage. Explain rationale and specific changes to existing Rules, if necessary.

AUTO

Automobile Network

The Role of the Automobile

At its best, the automobile provides speed, comfort, privacy and an extraordinary degree of personal mobility. When overused, however, automobiles quickly eliminate all of these advantages, trapping their drivers in congestion along polluted, featureless arterials and highways. To fulfill their promise, automobiles are dependent upon the success of other modes. Paradoxically, it is only by making walking, bicycling and transit more attractive than driving that we can make driving efficient and pleasurable. Even in the most congested corridors, we need only shift 10 percent of motorists to other modes in order for congested streets to flow freely.

The Automobile Network

The automobile network provides guidance for how trips should be distributed across the street system, and how streets should be managed so that they function well according to their purpose. Commercial boulevards that serve a whole region should be operated so that they serve regional trips more time competitively than district avenues and district streets. District streets, on the other hand, should be designed for local traffic and for speeds low enough that bicyclists and pedestrians can mix safely with cars.

HCDA proposes conceptual modifications to the street designations established in the Mauka and Makai Area Plans. These are described in Chapter 6 along with guidance on how different streets should be designed and managed to accommodate automobiles. Recognizing that one function of streets is to carry automobile traffic, Figure 5-8 shows the priority given to autos on various district streets, including future street connections. These are not meant as official street designations, which are addressed in Chapter 6, but rather an illustration of the role each street plays in local and regional auto mobility and for providing access to parking and loading for trucks.

Strategy MA15 Manage traffic to allow regional mobility and local access while limiting impacts to livability in the KCDD

Honolulu is consistently rated as one of the worst cities in the nation for traffic congestion and driver delay. Traffic analysis conducted for the Mauka Area Plan indicated that build out of the preferred land use scenario would lead to more traffic congestion on district streets. Traffic is unavoidable and congestion in the KCDD is likely to worsen. This plan recognizes that urban congestion is inevitable and the successful realization of land use, urban form and placemaking, economic, and cultural goals will lead to greater travel demand. Continuing to use traditional vehicle level of service measures as the benchmark for transportation success will require sacrificing other critical goals.

Many regional through trips are made on Kapiolani
Image from Nelson\Nygaard

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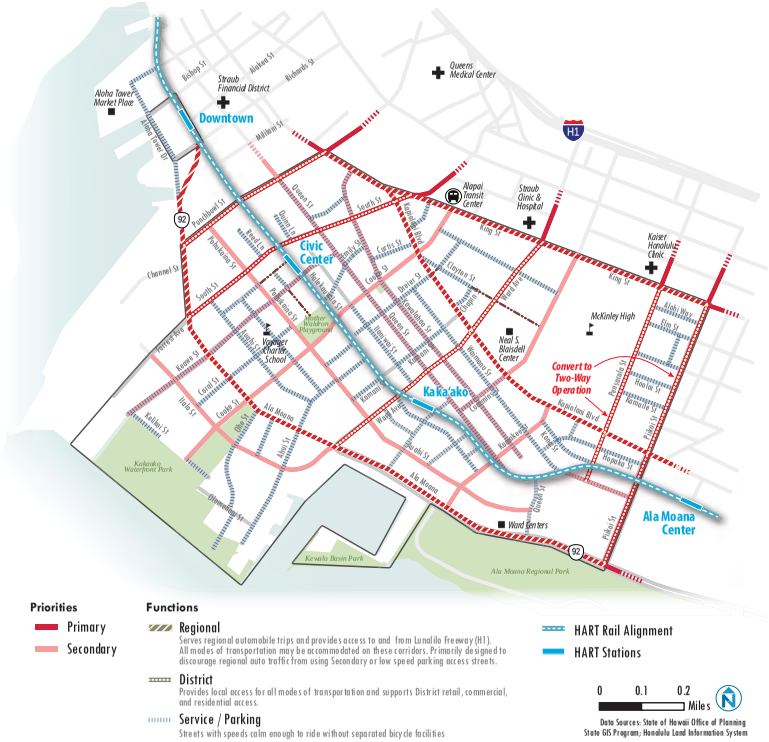
Figure 5-20 Street Priorities for Vehicular Travel



Building on the philosophy that transportation is only a means to support the broader social, economic, and environmental goals of the Kaka`ako community, HCDA adopts an approach that recognizes congestion will occur and is a integral component of a vibrant and bustling urban district, that transition to multimodal mobility and access is the only means to support KCDD land use goals, and that through-traffic can be managed to minimize impacts on the KCDD community.

Action MA15.1 Strive to maximize the efficiency of the existing automobile infrastructure and manage major boulevards and commercial avenues so that they provide shorter travel times than parallel residential avenues or mixed use streets

Chapter 6 (Complete Streets) details design strategies to ensure that streets within the KCDD that carry major regional through traffic – both autos and freight – are designed to balance access to the district with the need for efficient through movement. Local district streets that parallel major

regional through streets should be designed to provide local access and prioritize pedestrian quality, ensuring that through travel is more convenient on regional streets.

Action MA15.2 Develop a network of local access streets to promote delivery, parking, and loading off primary mobility streets

Kaka`ako's boulevards, avenues, and district streets will be required to carry more people as the district grows. Managing uses that require curb space and driveway accesses that cross bicycle facilities and sidewalks is a key strategy to ensure key mobility streets can be maximized for the purpose of moving people to and through key locations in the KCDD. HCDA will work with developers to encourage new local access streets, alleys, or shared streets that allow critical delivery and loading functions to occur internal to development blocks or on streets designated for local access and delivery (see Chapter 6 street designations).

Local delivery and parking access streets like Koula Street should be designed to accommodate large vehicles while respecting the walkable design of KCDD.
Image from Nelson\Nygaard

Strategy MA16 Provide a safe environment for all road users

Ensuring our streets are safe should start with a consideration of our most vulnerable users. If an keiki or kupuna can't walk safely on a street, is that the type of facility we want to support and continue to build? If a 60 year old doesn't feel as comfortable riding a bicycle as a 25 year old, have we provide a fair and equitable opportunity for community mobility?

Research is increasingly showing that city's with streets design for pedestrians and bicyclists, as well as motorists are safer overall. A 2011 study by Wesley Marshall and Norm Garrick (*Evidence on Why Bike-Friendly Cities Are Safer for All Road Users*) evaluated bicycle and pedestrian safety in 24 cities that varied significantly in their level of bicycle infrastructure investment. They found that those with higher levels investment had less pedestrian and bicycle fatalities per capita. This is attributable to a number of interrelated factors, including increased driver alertness to non-motorized travelers, better visibility of pedestrians and bicyclists traveling in large numbers, slower automobile speeds, lane width reductions from added bicycle facilities, higher intersection/traffic control density, and the effect of bicycle and pedestrian infrastructure as traffic calming.

AGING POPULATIONS & PEDESTRIAN SAFETY

According to the FHWA, the rate of pedestrian deaths is almost 1.7 as higher for people 70 and older combined than for those younger than 70 combined.

In short, complete streets within well connected networks that are carefully designed for pedestrians and bicycles as well as vehicles increase safety and enhance community livability. Chapter 6 provides design guidance how to design safer streets for all roadway users

Action MA16.1 Use traffic controls and design features to encourage motorists to drive appropriately for the type of streets they are using

More detail on complete street strategies that promote user safety are provided in Chapter 6 – Complete Streets.

Action MA16.2 Manage automobile speeds on major boulevards and district avenues to ensure comfort and safety for other roadway users

More detail on complete street strategies that promote user safety are provided in Chapter 6 – Complete Streets.

Strategy MA 17 Encourage a more sustainable transportation system

Since autos and buses will continue to move the majority of trips in and out of Kaka`ako for years to come, improving the efficiency and reducing emissions from those vehicles is important. Hawai`i and the Kaka`ako community are well positioned to be national leaders in low-emissions transportation technology. This move is of heightened importance in Hawai`i given its high level of reliance on imported fossil fuels for all mobile and stationary energy needs. To help make the shift from petroleum-based fuel, the state partnered in 2008 with the U.S. Department of Energy to create the Hawai`i Clean Energy Initiative (HCEI). A goal under this initiative is to reduce oil consumption by 70 percent by 2030 (30% from energy efficiency, and 40% from renewable energy). HCEI estimates that attainment of these goals will keep a substantial amount of the nearly $6 billion spent annually on imported oil here in the islands, creating jobs and benefiting the economy.[1]

Locally, HCDA can work with its partners to help realize these goals.

Action MA17.1 Promote public and private efforts to transition to clean vehicle fuels and technologies—especially emissions-free electric power

HCDA can provide necessary political support (infrastructure, policy, planning, etc.) for private electric vehicle adoption, adoption of next generation biofuels, and development of the supportive infrastructure.

Since Hawai`i's electric generation is largely from fossil fuels, optimizing the environmental value of increased electric vehicle use will require renewable energy powered charging stations. While most public Electric Vehicle (EV) charging stations operate from the power grid, there are solar powered stations on the market. SolarCity is marketing its solar energy systems along with electric car charging installations.

Solar powered charging station in Rio De Janiero
Image from Andricos

HCDA can also support the development and local adoption of biofuels, including aggressive near-term adoption of the best first-generation biofuels (sugar ethanol and equivalents), and development of second-generation bio fuels such as cellulosic ethanol (which may have life-cycle GHG emissions that are 70% lower than petroleum).

1 http://energy.Hawai`i.gov/wp-content/uploads/2011/09/updated-EV-Guidebook_FINAL_Sep-25_2012.pdf

The KCDD is home to the Hawai`i Center for Advanced Transportation Technologies (HCATT). HCATT has organized public/private partnerships between the federal government and private industry to develop advanced low emission and zero emission vehicles centered on electric drive technologies. Over the years, HCATT has been awarded more than $40 million in federal funds, which was matched by another $23 million from private partners. It is a national leader in the development of electric and hydrogen fuel powered vehicles.

The City of Honolulu installed public EV charging stations include one in at the Neil Blaisdell Center.
Image from City of Honolulu

ELECTRIC VEHICLE CHARGING STATION REGULATIONS

Hawai`i has among the most aggressive laws requiring EV charging stations in publicly available parking facilities. All parking facilities that are available for use by the general public and include at least one hundred parking spaces must designate at least one parking space specifically for PEVs by July 1, 2012, provided that no parking spaces required by the Americans with Disabilities Act Accessibility Guidelines are reduced or displaced. Spaces must be clearly marked and equipped with electric vehicle supply equipment (EVSE). Owners of multiple parking lots may designate and install EVSE in fewer parking spaces than required in one parking lot, as long as the total number of aggregate spaces for all parking lots is met. (Reference Senate Bill 2747, 2012, and Hawai`i Revised Statutes 291-71 and 291-72)

Action MA17.2 Develop "plug-in" electric vehicle charging stations throughout Kaka`ako

Hawai`i is a national leader in adoption of EV technology. Several groups have targeted Hawai`i for early ventures in EV charging due to excellent conditions for EV operations. The Hawai`i Department of Business, Economic Development and Tourism operates the Hawai`i EV Ready Grant program to help support electric vehicles infrastructure development. This program helped fund a public available charging station at the Neil Blaisdell Center in the KCDD among other locations around the City.

To spur the adoption of EV in the Honolulu metro area, Honolulu Clean Cities developed a Guidebook for Commercial Electric Vehicle Charging Station Installation that provides a comprehensive guide to planning, permitting, installing, and operating EV charging stations.

RULE CHANGE FOR KAKA`AKO

HCDA does not currently regulate the design of traffic facilities in the public right-of-way. Regulatory changes are focused on encouraging developers to provide infrastructure that would help private consumers transition to more sustainable vehicle types.

- **Regulation MA17.1:** Related to the inclusion of EV stations, HCDA will develop rules to support HRS 291 requirements to include at least one EV charging station in publicly accessible parking garages over 100 stalls.

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6 COMPLETE STREETS IN KAKA`AKO

Standard Street Elements

Planters and street trees

Bike parking

High visibility crosswalk markings

ADA-compliant curb ramps

Curb extensions (with parking)

Far-side transit stops (on transit streets)

Street furniture

Pedestrian-scaled lighting

Clearly defined sidewalk zones *(using paving techniques, special materials, etc.)*

Interpretive design and public art

Pedestrian countdown signals

Redevelopment setbacks

Transit-bicycle integration features (on priority transit and bicycle streets)

Optional Street Elements

DRAFT

Pedestrian priority signalization (Barnes Dance)

Pedestrian refuge island

Raised median/Center turn lane

Bike Share Stations

Rapid flashing beacons

Bus bulb out

In-street bicycle corral

Transit stop-building integration

Dedicated bicycle facilities (bike lanes)

On-street parking

Guideway column

Dedicated bicycle facilities (cycle track)

Stormwater management

Bollards

Bicycle facilities (sharrows)

Mid-block crossing

Dedicated loading zones

Vertical deflection (e.g., speed humps)

Transit lanes

Pro-time parking/ Peak hour bus lanes

Transit lanes

6 COMPLETE STREETS IN KAKA`AKO

CREATING MULTI-PURPOSE STREETS

As the famous urbanist, Jane Jacobs reminds us, "nobody enjoys sitting on a stoop or looking out a window at an empty street. Almost nobody does such a thing. Large numbers of people entertain themselves, off and on, by watching street activity." Streets are the lifeblood of an urban community. They don't simply provide a way to travel, but are our largest public space, providing the "living room" of any neighborhood–a place to socialize, recreate, and to move about.

The relationship between buildings and the street is the essential linkage between residents and their community. Done well, this linkage creates a vibrancy that will encourage engagement, health and quality of life in Kaka`ako. Streets designed primarily for the private automobile deliver monotonous, and unsecure public spaces that discourage public interaction. Most streets in Kaka`ako are currently auto-oriented – the types of places a pedestrian would hurry to pass through rather than linger and enjoy.

This chapter provides a framework and principles to develop a more balanced, vital, and community-serving street system in the KCDD.

King Street in 1930 accommodated pedestrians, streetcar, automobiles, and even bicycles. This corridor once operated as a slow, pedestrian-oriented street.
Image from State of Hawai`i

Image from Nelson\Nygaard

DESTINATION-BASED COMPLETE STREETS

Streets are the backdrop of daily life and commerce in Kaka`ako. Today, people use the District's streets to get to work, park, walk to the bus, or to make a delivery. Few people chose to walk the streets for non-utilitarian purposes. When the HCDA TOD Overlay Plan is realized, a key measure of success will be the number of people that come to Kaka'ako to enjoy its streets. Making KCDD streets livable will require providing opportunities for social interaction and commerce, developing spaces for leisure and recreation, as well as improved functionality for all users. Below are some examples of exemplary destination streets that expand the traditional definition of "street."

Kalakaua Avenue, Waikiki, HI

A prime of Honolulu street prioritized for pedestrians and retail access
Image from All Hawaii News

Lincoln Road, South Beach, Miami

World class shopping street.
Image from Miami City Diggs

Main Street, Santa Monica, CA

A warm weather retail street
Image from Gary Kavanagh

NW 13th Avenue, Portland, OR

Redevelopment district street retains light-industrial feel and slow-mixed operations
Image from Nelson\Nygaard

Yaletown Blocks, Vancouver, B.C.

Redevelopment district street retains light-industrial feel and slow-mixed operations
Image from Yaletown Blog

Third Street Promenade, Santa Monica, CA

A renowned pedestrian priority street anchored by frequent transit service and a future light rail transit station.
Image from Nelson\Nygaard

WHY COMPLETE STREETS FOR THE KCDD?

At the most practical level, Complete Streets in the KCDD are necessary to accommodate much greater number of residents, workers, and visitors to the District as surface parking lots and one-story commercial buildings are transformed to residential towers, retail, and busy civic uses. Viewed more broadly, the streets of Kaka`ako are the connective tissue that, if designed well, will make a mere collection of buildings into a vital urban community.

Complete streets in the KCDD will:

Ensure safety. Streets that manage auto speeds, and provide sidewalks, medians, well-designed crossings, amenities for mobility impaired users, separated bicycle facilities are proven to be safer for pedestrians, motorists, and bicyclists alike.

A calmed street in Vancouver, B.C.
Image from Dan Burden

Encourage active lifestyles. Complete Streets in the KCDD can help support a healthy citizenry and reduce health care related costs. Building streets that support pedestrian and bicycle travel both enables *and encourages* greater levels of physical activity and active transportation.

Extend transportation choice. Providing safe and convenient transportation choices to citizens is an important goal for all communities. Complete Streets is a democratic design and policy framework that ultimately extends resident and employee mobility options. Doing so means KCDD can to meet the needs of different types of users and provide alternatives to traffic congestion and costly trips to the gas pump. Providing a diverse range of time-competitive travel options is particularly important for the large inclusionary housing market planned for the KCDD.

A shared street in San Francisco, CA.
Image from Nelson\Nygaard

Stimulate and support the local economy. Complete Streets not only expand opportunities to access local retail and employment sites, but also nurture the local economy. Often referred to the "green dividend", enabling walking, bicycling, and transit use can redistribute roughly $9,000 of a person's annual disposable income from operating and maintaining a car to local retail, entertainment, and restaurant expenses.

A main street in Santa Barbara, CA.
Image from Nelson\Nygaard

Create places and destinations. Complete Streets reorganize underutilized roadway space toward economic and social uses. The TOD Overlay Plan envisions a Kaka`ako that is a major destination in Honolulu, not just as a point between downtown and destinations Diamond Head of the district (Ala Moana and Waikiki). Complete Streets provide the gateway to Kaka`ako, but are also the attraction.

Lower the cost of street maintenance and construction. Building new streets or reconstructing existing streets using Complete Streets principles is more economical than constructing auto-centric roads. Complete Streets move more people with less space, thereby limiting the need for future roadway expansion and ensuring more space is dedicated to civic uses. Increased walking and bicycling reduces wear-and-tear on roads, which can extend the lifetime of Kaka`ako's streets and reduce annual preventative maintenance costs.

Improve transportation efficiency & network capacity. Complete Streets improve roadway efficiency and capacity for all users by moving more people in the same amount of space. More informed metrics of success that measure person carrying capacity rather than traditional vehicle-oriented performance measures are often used to determine successful use of limited roadway space.

Automobiles require much greater capacity to move the same amount of people than buses, bicyclists, and pedestrians.
Image from City of Muenster, Germany

Building Community, Not Auto-Capacity

The street network serving Kaka`ako includes both highly congested regional arterials such as Ala Moana Boulevard, Kapiolani Boulevard, and King Street. On the other hand, local district streets like Queen Street, Cooke Street, and Ward Avenue are underutilized, with more pavement width than is necessary to carry current traffic volumes. As currently designed, they don't support active retail uses, or an active and healthy street life.

Many streets designed in the last 50 years were designed around a single principle – the need to minimize auto traffic congestion. It is important to understand that congestion is not simply the result of a road that does not have enough capacity for cars, but is also a result of overreliance on one mode (auto travel) over other modes (walking, bicycling, and transit use). A more important measure of the success of a street grid is the person-moving capacity, considering all modes of travel. Moreover, as roadway capacity is added to address congestion, space is taken away from bicycling, walking and fast moving transit. Adding roadway capacity may reduce traffic congestion in the short term, but ultimately, new capacity attracts new auto demand, and the cycle begins again.

Focusing entirely on auto capacity is counter-productive to HCDA's efforts to develop a vibrant, pedestrian-oriented, urban district—even as Kaka`ako faces exceptional population and employment growth. A multimodal approach to street design and operation is the solution to simultaneously

address congestion, maximize use of existing right-of-way, help build a transit-oriented community, and facilitate district access.

To implement this multimodal approach, HCDA will adopt a Complete Streets framework and rethink how street performance is measured. Doing so will ensure the KCDD:

Vanderbilt Avenue in New York City is a true multimodal street that expands person capacity while strengthening the retail corridor.
Image from Paul Carlos

- Becomes a mixed-use district that allows residents to meet their needs locally, reducing the need to make cross-island or inter-neighborhood trips by car. This requires an integrated land use strategy (see Chapter 3).
- Makes the most efficient modes of transportation – walking, biking, transit, carpooling, and car-sharing – more attractive than driving alone. Making these modes more competitive allows the street network to move more people and unlock transit efficiencies.
- Influences mode choice by reducing or eliminating parking subsidies (see Chapter 8 for more information on parking management).
- Allows roads to be congested during peak demand hours even as the district increases density. Alleviating congestion with roadway widening negatively impacts all other modes, as well as impacting downstream signals or internal neighborhood streets. Adding capacity typically encourages "latent demand"[1] for roadway space, resulting in increased and prolonged congestion issues.

1 New vehicle trips enabled by the temporary lessening of delay.

RETHINKING CONGESTION

Congestion is an inevitable reality of urban redevelopment in the KCDD, and catering to more auto trips will only degrade the multimodal transportation system, reduce user safety, and—perhaps most salient to HCDA—limit the district's quality of redevelopment.

What may be seen as counter-intuitive, congestion is a necessary component of a strong, dynamic economy where people move between their home and job site, residents and visitors access retail to spend their discretionary income, and freight facilitates commerce. Traffic congestion is merely a sign of economic success. In fact, the only successful cases where congestion was eliminated through increasing roadway capacity are Rust Belt cities facing economic decline and population loss.

Image from Flicker Casey Serin

Strategy CS1 Preserve current levels of auto mobility on major regional thoroughfares

The KCDD can accommodate substantial amounts of residential and commercial growth over the next 25 years and still provide streets that comfortably move people between district destinations. To achieve the optimal balance between growth and people movement, two key actions must be achieved.

Action CS1.1 Increase district access using spatially efficient modes such as walk, bike, and transit

With the addition of new street and pedestrian connections proposed in Chapter 5, Kaka`ako's street network contains the necessary person capacity to keep the KCDD moving and bustling with life. In order to achieve this, clear street design principles and multimodal street types should be established to guide design decisions and strategically reprioritize KCDD streets for the movement of people on foot, on bicycles, and on transit.

Most destinations in the KCDD are within a walkable distance from each other. Kaka`ako should be designed to be a true pedestrian district.
Image from Nelson\Nygaard

Action CS1.2 Focus on the right kind of development, in the right locations, with the right system, parking, and demand management tools in place

Redevelopment of TOD sites, master planned sites, and other areas of KCDD must simultaneously employ strategies that reduce auto trip demand, while establishing district streets that are walkable and complete. The end result should be to maintain or slightly increase auto access compared with current levels while accommodating most new trips on foot, by bicycle, on transit, or other sustainable travel options.

Strategy CS2 Limit right-of-way expansion to new street connections, redevelopment setbacks, and additional dedications for special pedestrian realm uses

For the most part, existing KCDD streets are built out. Limited land exists to widen roads to accommodate single-occupant vehicle demand, transit only lanes, or dedicated bicycle facilities. Thus, roadway improvements should generally occur within the existing right of-way and should never narrow the existing pedestrian realm, *even to accommodate turn lanes*. Depending on the corridor, new modal facilities may have to come at the expense of a travel lane or parking based on a particular street's land use context and function.

Image from Nelson\Nygaard

COMPLETE STREETS: A PRIMER

WHAT ARE COMPLETE STREETS?

Complete Streets is a shorthand term for streets that have been planned, designed and operated with consideration to needs of all travelers including people of all ages and abilities whether they are walking, riding a bicycle, taking public transportation, or driving. Complete Streets offer an overarching strategy for communities to meet their economic, social, and environmental goals. Every street, the land uses it supports, and topographic context differ; actual implementation of Complete Streets principles will change in the local context. The only constant tenet of Complete Streets is the provision of safe facilities for all users.

Complete Streets should never be formulaic. There is no one size fits all design.

The term Complete Streets in the context of the KCDD TOD Overlay Plan means both a process and a product. The process is the steps and decisions that lead to a specific street or intersection design; the product being the on-the-ground result of this process and the range of street designs that can be used on similar street types in Kaka`ako.

Most importantly, Complete Streets are a partnership between the agencies that plan, design and maintain them – including the HCDA, the City and County of Honolulu DTS, and HDOT – and the communities and businesses that they serve.

Complete Streets are not:

- Focused solely on auto mobility
- Focused solely on one street—a Complete Network is as important as a Complete Street!
- A specific design prescription
- A mandate for an immediate retrofit
- A silver bullet solution for all transportation issues

When should Complete Street designs and principles be applied?

- New street construction
- Street or sidewalk reconstruction
- Street or sidewalk rehabilitation
- Street resurfacing
- Maintenance
- Operations
- When new development is required to build street and pedestrian facilities
- Public-private ventures

Most Complete Streets projects in KCDD will be retrofits of existing roadways, like this bikeway retrofit of Third Street in Long Beach, CA.
Image from LA Streetsblog

Exceptions to this rule include use of redevelopment tools such as setbacks or dedications for specific uses like bike share stations and new narrow street or pedestrian only connections.

INTEGRATING LAND USE AND STREET DESIGN

The many benefits of locating new development near high capacity transit are described in Chapter 3 of the TOD Overlay Plan. Based on transit-oriented development literature, by locating development near future HART stations and other frequent transit service hubs, the KCDD's peak period vehicle trips can be cut by roughly 20-40%, compared to the traffic it would generate elsewhere.

Portland's Pearl District integrates a mix of dense commercial and residential land uses with narrow streets, wide sidewalks, and frequent transit service (streetcar and bus).
Image from Nelson\Nygaard

The TOD Overlay Plan concentrates future growth in the KCDD neighborhoods that are within comfortable walking and bicycle distance of HART stations, destinations, and services. In addition, the plan establishes strategies to improve pedestrian and bicycle connectivity and safety, thus making walking and bicycling attractive, safe, and efficient modes of travel. The combined effect of rail proximity, integrated land use development, a high quality active transportation network, a wealth of local businesses proving needed personal services, and mobility alternative to the private auto (i.e., bicycle sharing, car sharing, etc.) will reduce per capita vehicle trip making.

Strategy CS3 Integrate Land Use and Building Form with Street Design and Programming

Designing Complete Streets requires attention to context of the street and the land uses it serves. Street design must integrate the needs of the surrounding environment, built or natural. Main streets often feature on-street parking to support street retail uses and accommodate business access for driving customers. Dense, urban streets feature expansive sidewalks with street furniture to accommodate high pedestrian volumes, workers seeking lunchtime or post-work repose on a bench, and even space for food carts or other uses that make a district street lively and active.

Each KCDD street should be designed and operated to support the land uses it immediately serves. Land uses are defined in Chapter 3 of this plan. Take Commercial Avenues as an example. Commercial Avenues, such as Ward Avenue, Pensacola Street, and Piikoi Street, need to attract and accommodate a customer base by providing reliable vehicle access, but ensuring that priority is given to the pedestrian. This become particularly important as new retail orients to the street, rather than being setback behind surface parking. Commercial avenues provide access by a variety of modes and benefit from on-street parking to provide access for short-stay customers and to buffer busy sidewalks from traffic. Busy commercial areas in Kaka`ako should prioritize transit and pedestrians.

STREET DESIGN PRINCIPLES

A two-part process was used to establish a conceptual Complete Street typology:

- Establish a balance between four basic design principles or factors – livability, access and mobility, demand, and safety, described below
- Determine modal priorities to allocate limited right-of-way

The four principal design factors used to develop the Complete Streets typology include **Livability**, **Access and Mobility**, **Demand**, and **Safety**. These factors ensure the Complete Streets typology organizes a calculated design response to the specific, local context of each street. Future work by the HCDA will develop detailed design guidance and local application of the Complete Street types defined in this plan.

Livability. Livability is a central theme of the KCDD Overlay Plan and it is interconnected with the three other design principles. Livability requires that the broadest possible array of users are being served: motorists, pedestrians, bicyclists and the auxiliary needs of land uses that may extend into the street right-of-way. Livable street design uses lane configurations and dimensions that balance different street uses and ensures aesthetics, plantings, and furnishings which transform a streetscape into a usable public space.

Demand. The demands that redevelopment will have on KCDD streets must be addressed in the design of district streets. Neighborhoods within the district that will experience the largest increases in residential and commercial growth need to be supported by streets that can move the most people, rather than the most cars. Assuming that the right-of-way of streets will remain constant, the combination of redesigned multimodal streets and new street connections will need to carry the load of additional travel demand within and through the KCDD.

Access and Mobility. The City's current functional classification typology is based on defining different streets with respect to their general function in the transportation system—consisting of minor arterials, collector streets, and local streets. This remains important for the street types defined in this chapter, with cross sections designed to meet access and mobility needs.

Safety. Safety is the most important factor when designing streets. Some streets in particular feature adjacent uses or have certain user needs that require special safety accommodations. Accommodating mobility as described above does not require designing for high speed traffic; keeping pedestrians and bicyclists safe often requires slowing traffic down. Transit facilities (including bus stops and future HART stations), schools, hospitals, religious sites, and other community-oriented land uses that generate pedestrian traffic often require special treatments or even a cross section design that emphasizes narrower lanes and design elements that further reduce vehicle speeds. This is most critical at intersections and mid-block crossings, where conflicts between pedestrians, bicyclists and motorists are at their highest concentration.

Designing for Multiple Modes

Designing a complete, truly multimodal street requires proper allocation of street space and investment for different modes in the KCDD. Figure 6-1 reaffirms the "Pedestrian First" hierarchy described in Chapter 5.

This hierarchy represents a major change in thinking in Honolulu. While such change is often met with frustration at first, motorists who drive sensibly, slowly, safely, and respectfully are rewarded in a Complete Streets approach. A Pedestrian First hierarchy adheres to the performance standard of optimizing streets to move people, rather than vehicles. The following section provides basic street design principles for each mode in the Pedestrian First hierarchy.

Figure 6-1 KCDD Modal Hierarchy

Pedestrians First

People make cities great. Success of the TOD Overlay Plan will mean a major increase in pedestrian traffic in the KCDD. Most trips begin and end on foot; in dense mixed-use urban neighborhoods many trips are made solely on foot. The TOD Overlay Plan envisions a KCDD filled with residential and commercial life. Developing a world-class pedestrian environment is a key to the implementing this vision.

A pedestrian-first design is a safety-first design, designed with the intent of keeping pedestrians of all ages and abilities feeling safe and comfortable on the street. Pedestrians, particularly those that are old, adolescent, or experiencing a mobility impairment are vulnerable to injury and death by vehicles. Be it a sidewalk, crosswalk, pedestrian signal, or transit passenger facility, all pedestrian facilities must comply and exceed design requirements established by the Americans with Disabilities Act (ADA) as HCDA strives to retrofit Kaka`ako's streets as universally accessible.

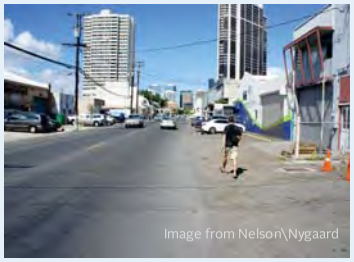
BALANCING THE DESIGN FACTORS

The four design factors on the left guide the development of representative cross section options for each street type (displayed in street type sheets later in this chapter). One of the four design factors will serve as the predominant consideration for each cross section.

This is not to suggest that this is the only factor that should be considered in street design, but it does emphasize this one factor as the reason a given type of street is distinct from others (and therefore why a variety of cross sections is necessary to respond to the complex land use environments in the KCDD).

	Primary Factor	Ancillary Factor
Livability		X
Access & Mobility	X	
Demand		X
Safety	X	

Note: Safety is a primary design factor for all streets.
Source: Nelson\Nygaard



The Pedestrian First focus of the KCDD is particularly supportive of our island culture. There is a strong focus on multi-generational family living on O`ahu. The ability of the KCDD to support multi-generational families to live comfortably in an urban environment is paramount and must be reflected in the design of Kaka`ako's streets and public spaces.

Image from Nelson\Nygaard

Transit-Oriented

Buses and, eventually, rail rapid transit will extend the range of activity for Kaka`ako's residents and vastly improve the speed and quality of access to and from the KCDD. Premier access to transit is and will increasingly be a selling point for people relocating to the KCDD. Bus operations and access to transit must be considered in the design of the travelway—for bus/rail access, as well as for those that walk, bike or get dropped off at the station. Transit's influence on street design include lane width, intersection design (corner radius), transit-priority lanes (and queue jump lanes), signal timing (often adjusted to give transit an advantage, transit-signal priority), pedestrian access (street crossings at bus stops), sidewalk design (making room for bus shelters and large passenger queues), and bus stop placement and design (farside/nearside at intersections, bus pullouts, or bulb outs). Access and volumes at HART stations must interface well with street design, especially where there are large volumes of pedestrians. These considerations are detailed in Chapter 7.

Image from Nelson\Nygaard

Bicycle Streets for Different Bicyclists

Bicycling is a critical element of fostering safe and livable streets in Kaka`ako. Bicyclists, along with pedestrians, are vulnerable users who benefit from reduced traffic speed and dedicated facilities. Because bicyclists vary in skill level, age, and comfort levels (as they relate to speed and operating behavior), KCDD must provide a broad variety of facility options to allow the range of current and future bicyclists to comfortably reach their destinations in the district and beyond. This includes shared lanes, bike lanes, buffered bike lanes, cycle tracks, off-street multi-use paths, and the assortment of intersection treatments that enhance safety at major and minor junctures.

In addition to the traditional notion of bicycles as a transportation and recreational tool, bicycling is a social activity, and people often ride side-by-side or in groups. Likewise, bicycles are increasingly being used in urban environments to make local deliveries, possibly addressing a missing link in Kaka`ako's freight network. The design must take into account the diversity of activities and potentially types of bicycles being used in Kaka`ako (e.g. a standard road bike is distinguished by vastly different spatial needs than a larger cargo bike).

In the end, bicycle facility selection must consider street conditions including available right of way, parking availability and turnover, bicycle volumes, auto volumes and speeds, and freight and transit volumes and routes, among others. Refer to the North American City Transportation Official's (NACTO) Urban Bikeway Design Guide for specific criteria.

Image from Nelson\Nygaard

Sensible and Balanced Private Auto Accommodation

Private autos are an integral part of both the regional and central Honolulu circulation system. Even though private autos are considered the lowest priority in KCDD's modal hierarchy, they still must be accommodated, albeit within the constraints of lower speeds and safer, more observant driving. More flexibility is given to large delivery trucks, as the efficient delivery of goods is paramount to supporting a healthy economy and meeting needs of KCDD's current and future businesses.

FREIGHT AND DELIVERIES

Freight and goods delivery is vital component part of any urban city's street network. Freight is not in the modal hierarchy because goods movement may be carried out by a variety of modes, including:

- Trucks (auto)
- Bike trailer or cargo bike (bicycle)
- Delivery person (pedestrian via auto)

Currently, most freight movement is delivered by medium- and large-sized trucks. Thus, mode priorities established for specific streets in Chapter 5, especially those within light industrial areas and along streets that carry regional through traffic, consider larger truck vehicles, which suggest slightly higher priority for automobiles.

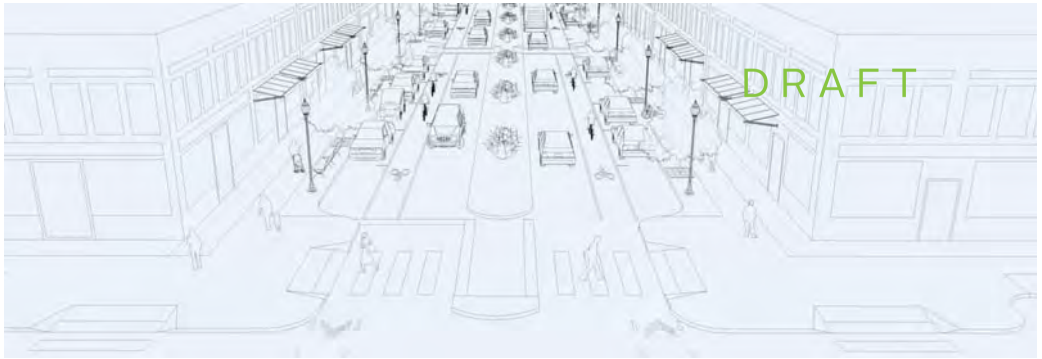
As a working district with many light industrial uses, light-freight and delivery functions will continue to be of critical importance and considered in design and street priority.

Image from Peter Hvizdak

GENERAL MULTIMODAL DESIGN PARAMETERS

The table below presents basic design considerations that are applied contextually when developing Complete Streets. Additional detail beyond these considerations will be established in KCDD Complete Street Design Guidelines to be developed through a future process.

Element	Design Consideration/Parameter
General purpose travel lanes	Ten to twelve foot travel lanes can safely and effectively accommodate vehicle travel. A travel lane on truck or bus route should be 11-12 feet wide in the travel lane typically used by buses and large trucks (almost always the outside or curb-tight travel lane).
On-street bicycle dedicated facilities and buffering	The widths of dedicated bicycle facilities depend entirely on street conditions such as travel speeds and volumes as well as the anticipated level of demand for each particular facility. Generally, bike lanes should be no less than 6 feet wide. Striped buffers are strongly recommended to be paired with bike lanes, particularly on high speed/volume streets (necessitating a 2-3 foot buffer between the bike facility and the adjacent travel lane) or with on-street parking (necessitating a 1-2 foot buffer from the center of the parking lane stripe). Cycle tracks should range between 6-7 feet in width (not including a 3-foot minimum raised median or bollard-protected striped buffer). If the cycle track is to operate bi-directionally the width could range between 10 and 14 feet with a minimum 3-foot raised or striped buffer.
Parking	Generally, parallel parking stall widths are recommended to range between 7.5 and 8 feet. Seven-foot parking stalls are acceptable in low density residential environments. The combination of travel and parking lane next to one another should be no less than 18 feet in width (11-foot travel and 7-foot parking or 10-foot travel and 8-foot parking).
Shared lanes	Shared auto/bike lanes should be targeted for widths of 12 feet, but may be as low as 10 feet wide. Placement of shared lane markings should be located appropriately to allow for safe passing movements by motorists and to locate cyclists outside of the door zone along streets with on-street parallel parking.
Transit stop accommodations	Street design should optimize operational efficiency, rider convenience, multimodal safety. Street types that accommodate on-street parking should integrate bus bulb outs—large curb extensions that house bus stops in order to extend passenger comfort, expand pedestrian capacity, and allow for inline boarding. In general, bus pull-out lanes are not recommended here as they are expensive (additional right-of-way costs), infringe on the pedestrian realm, and are inefficient for bus operations. Buses experience greater difficulty and delay re-entering traffic when required to use pull-outs. Establishing stops at the far side of intersections is also recommended so that street and intersection design can be consistent throughout Kaka`ako. Far-side stops: • Reduce intersection delay for right turn movements • Minimizes operational delay for buses by allowing a bus accelerating after making a stop to continue moving and not have to wait through a signal cycle. • Eliminate the chance of multiple threat collisions with passengers departing the bus and crossing the street.
Bicycle-bus facility integration	Where bicycles and transit vehicles interact at transit stops, dedicated bicycle facilities should wrap around transit shelters or transit shelters should extend into the parking lane. This configuration should only occur at far-side transit stop locations, never at near-side stops. Mixing zones (behind the transit shelter) should be designed with continental crosswalk markings and/or special paving features. Signs should warn pedestrians and bicyclist of these mixing zones. In addition, transit shelters should be transparent to enhance visibility between pedestrians and bicyclists passing around the shelter.
Curb extensions at intersections and mid-block locations	Any street with on-street parking should include curb extensions at intersections. A curb extension should be 1-2 feet less the width of the parking lane. Where a curb extension opportunity exists on a street with a cycle track, pedestrian refuge islands will serve as the "extension". Where the curb extension occurs at a mid-block location (to facilitate mid-block crossings), the facility should extend one foot past the parking lane to preserve sightlines for pedestrians and motorists.



COMPLETE STREET TYPES

Streets in Kaka`ako serve many purposes. Kaka`ako streets move pedestrians of all ages and abilities, transport and store bicycles, keep transit flowing and provide comfortable places for passengers to wait and board, transport freight and provide space for deliveries, and move and store autos. Streets are an integral component of the district's urban fabric. They make up large portions of the neighborhood serving as open space for socializing and recreation as well as civic and economic space. A Complete Street typology will help balance competing demands on Kaka`ako streets and will ensure that the design of streets builds on and supports the TOD Overlay Plan's goals for livability and neighborhood quality of life.

Strategy CS5 Establish a Complete Streets Typology and Design Guide

This strategy suggests a framework for KCDD street and intersection types and supports further development of specific Complete Steets guidelines for the various streets in our district. Street types should be developed based on the relationship of adjacent land uses to the street (see Chapter 5 for more information on street priorities). This typology offers detailed guidance for the needs of each mode, including walking, bicycling, transit and automobiles. Some streets, like Kapiolani Boulevard, must allow transit to maintain reliable, competitive operations and to allow vehicles to progress at a rate that ensures through-trips are not diverted to internal district streets and commercial avenues. While all street types must accommodate pedestrians comfortably, some streets will require a great level of concentrated investment to ensure pedestrian safety and comfort along and across the street can be achieved.

The street types described below establish the basis for setting design parameters by land use context (summarized in Figure 6-3) and provide guidelines for managing difficult multimodal trade-off decisions. Future street design guidelines should identify the specific

STREET TYPES IN THE KCDD

The street types listed below frame the design of KCDD streets and should be used to determine which design elements are appropriate for the district various land use contexts.

- **COMMERCIAL BOULEVARDS AND AVENUES**
  - Regional Boulevard
  - Transit Boulevard
  - Commercial Avenue
- **DISTRICT STREETS**
  - Residential Street
  - Commercial/Light Industrial Street
- **LOCAL STREET**
- **DISTINGUISHED STREETS**
  - Rapid Transit Street
  - Promenade

design treatments that will be applied to these street types. Figure 6-2 designates a conceptual street type on each KCDD street.

Further development of the KCDD Complete Street typology and specific design guidance will consider roadway design standards and the existing system of functional classifications upheld by the City and County of Honolulu Department of Transportation Services (DTS). The development of Complete Street design guidance will be completed in close coordination with the DTS, Hawai`i DOT, emergency service providers, and other district and regional stakeholders to ensure balanced, context-sensitive design is achieved.

Figure 6-2 KCDD Complete Street Typology

Figure 6-3 KCDD Street Type – Land Use Relationship

STREET TYPE BY LAND USE	GENERAL LAND USE CONTEXT	
Commercial Boulevards & Avenues		
	Regional Boulevard	**Primary:** Civil support, Civic, Office, Goods & Services **Secondary:** Automotive, Residential
	Transit Boulevard	**Primary:** Civil support, Civic, Office, Goods & Services **Secondary:** Residential
	Commercial Avenue	**Primary:** Office, Goods & Services **Secondary:** Residential
District Streets		
	Residential Street	**Primary:** Residential **Secondary:** Educational, Civic, Goods & Services
	Commercial/Light Industrial Street	**Primary:** Office, Goods & Services, Industrial **Secondary:** Civic, Residential
Local Streets		
	Local Street	**Primary:** Residential, Automotive (parking only; no drive-thrus, auto sales, etc.) **Secondary:** Civic, Office, Goods & Services, Educational, Civil support
Distinguished Streets		
	Rapid Transit Street	**Primary:** Residential, Office, Goods & Services **Secondary:** Educational, Civil Support
	Promenade	**Primary:** Goods & Services **Secondary:** Residential, Office

Note: Land use mix will vary by neighborhood.

INTERSECTION DESIGN PRINCIPLES

To make streets accommodative, comfortable, and safe for all users, attention also needs to be given to the places where streets intersect. Since these are the places where users meet, interact, and cross, intersections are the points of greatest conflict and the places where users are most likely to feel threatened. Intersections exhibit several common elements regardless of their type or category. Figure 6-4 on the following page offers a basic summary of these elements.

This section offers basic principles of complete intersection and crossing design. It also suggests intersection and crossing types for which HCDA will develop more detail design guidance in the future.

Strategy CS6 Establish Intersection Design Guidance

When designing and retrofitting intersections, the pedestrian should not be characterized as a single individual but rather a range of users—children, seniors, people pushing or pulling strollers and delivery carts, people using a wheelchair or scooter, or those traveling with a cane or a service animal. The street and pedestrian environment at intersections must function effectively for each of these "pedestrian" types while accommodating throughput for other modes.

One simple tenet of intersection design should be adhered to in any case: Intersections should be designed and operated as simply and as compact as possible.

The following principles help to achieve complete, accessible, functional, and safe intersections.

- All corners follow universal design principles and match state of the practice accessibility standards (PROWAG)
- Signals are responsive to needs of visually-impaired pedestrians
- Movement of each mode is predictable to all users
- Intersection geometry is compact as feasible
- The number of approach and receiving through lanes are equal and align with no skew
- Perpendicular intersections are better than skewed
- 3-4 approaches are better than 5 or more
- Vehicle speeds are managed, especially for turn movements
- Crossing distances are minimized by reducing pavement and including pedestrian refuges
- Crossings match pedestrian desire lines, whether at intersections or mid-block locations
- Crossings and pedestrian staging areas are located within sight triangles
- Transit stops are organized to limit transfer distances and facilitate safe crossings
- Far-side transit stops are better than near-side transit stops
- Bicycle movements are made as visible and predictable as possible
- Priority is given to cyclists over turning autos
- Signal phasing is predictable and prioritizes pedestrians, bicyclists, and transit (in that order)
- Person delay is minimized
- Signal timing safely accommodates harried and leisurely walkers
- Non-auto or bicycle space is reallocated to sidewalk or refuge islands by default

- Landscaping, street trees, and furniture are integrated, but never restrict sight lines between modes
- All intersections are illuminated per Crime Prevention through Environmental Design (CPTED) guidance

Figure 6-4 shows common intersection elements and Figure 6-5 illustrates common urban intersection types.

Figure 6-4 Common Intersection Elements

A Far-side stops/Bus bulbouts Far-side stops minimize operational delay and allow buses to move out of the intersection, so that turn movements behind them can continue to occur. Bus bulbouts move passenger shelters or queuing areas away from the pedestrian zone and reduce pedestrian crossing distances.

B Mid-block crossing Mid-block crossings provide direct walking routes and reduce the effective length of the block.

C Accessible curb ramps Curb ramps safely and seamlessly connect mobility impaired individuals between the sidewalk and street. Curb ramps are tactile to ensure legibility for site-impaired users.

D Bike-transit integration Bicycle and transit facilities are designed to reduce conflicts between bikes, transit vehicles, and pedestrians.

E Intersection bicycle crossing Intersection markings indicate the safe, direct, and visible path of bicyclists traveling through an intersection or driveway conflict zone.

F Pedestrian refuge islands Refuge islands reduce crossing distances, improve pedestrian visibility, and facilitate crossings across longer crosswalks.

G Curb extensions Curb extensions continue the sidewalk into the parking lane at intersections or mid-block locations to improve visibility of pedestrians waiting to cross, reduce crossing distances, and provide additional space for placemaking features.

H Signalization Traffic signals control vehicle and pedestrian movement at intersections or mid-block crossings.

I Colored bike boxes Designated priority queuing areas for bicycles that help clear an intersection quickly and help reduce right-hook collisions.

J Sidewalks Spacious, clearly defined, and continuous sidewalks are requisites for Complete Streets and transit-oriented neighborhoods.

K Two-stage turn queue boxes Turn facility allowing cyclists to safely and comfortably exit cycle tracks or bike lanes that require bicyclists to negotiate difficult lane merges.

L Crosswalks Highly visible and defined crosswalk facilities ensure safe and comfortable crossings.

M Median nose Median noses provide additional protection for crossing pedestrians and slow left turn movements.

N Advanced stop bars Stop bars increase automobile stopping distances from crosswalks, thereby improving crossing comfort.

Source: Nelson\Nygaard

Figure 6-5 Common Intersection and Crossing Types

Signal	All-way stop
3 or 4-way traffic signal controlled intersections	3 or 4-way intersections where all legs of the intersection are controlled by stop signs
Features	**Features**
Complete signals address all modes and are ADA compliant. Left-turns should include permitted phases (not permissive) and pedestrian, bicycle, and transit signal priority phases should be integrated, where necessary.	Stop signs are typically installed to manage auto traffic, which may have an impact on bicycle travel. Stop signs should be limited on secondary bikeways. Advanced stop bars should provide a comfortable space between pedestrians and waiting vehicles.

Two-way stop	Uncontrolled
One-way or two-way intersections where the major street is uncontrolled, but the minor street is controlled by a stop or yield sign	Intersections without traffic control devices (stop sign, signal)
Features	**Features**
Without dedicated stops controlling major streets, these locations may act as a barrier to some cyclists. Additional provisions may be necessary to facilitate bicycle/pedestrian crossings, such as half signals or median barriers with pedestrian refuges. Advanced stop bars should provide a comfortable space between pedestrians and waiting vehicles.	Uncontrolled intersections often at low volume, low speed locations. Efforts need to be made to ensure speeds are slow (through traffic calming) and bicycle and pedestrian crossings are clearly marked and visible.

Mid-block crossing	Enhanced bicycle and pedestrian crossing	Driveways
Formal street crossing between intersections.	A signal or stop-controlled overlay intersection with bicycle/pedestrian priority features	An accessway offering motor vehicle access to public or private property Accesses to private property are considered an intersection as auto traffic intersects the sidewalk and dedicated bikeways.
Features	**Features**	**Features**
People generally cross at the most convenient location. Mid-block crossings help to facilitate pedestrian desire lines. Mid-block crossings should include designated crossing facilities like crosswalk markings and pedestrian refuges. Traffic control devices may or may not be used depending on the number of travel lanes, volumes, speeds, and a variety of other factors.	Intersections that include design or operational features to enhance and/or prioritize bicycle and pedestrian crossing movements. Features may include rapid flashing beacons, priority signalization phases, bike boxes, two-stage turn boxes, median barriers with pedestrian refuges, among others. See Figure 6-8 for proposed enhanced bicycle and pedestrian crossing overlay locations.	These include signal controlled driveway accesses into major destinations like Ala Moana Center. Driveways should always be designed as subservient to the sidewalk. Keep the driveway as small as possible, including width and corner radii. Driveways should be designed for 10 mph and oriented 90 degrees to the Street. Intersection bicycle crossing treatments appropriate for street intersections may apply.

DRAFT

ELEMENTS OF THE COMPLETE STREET CROSS SECTIONS

Complete Street design considers two main "environments: the Throughway (between the curbs) and the Pedestrian Zone (from the curb to lot line/building front).

THE THROUGHWAY

The principal part of the street for vehicles is the throughway, consisting of all space between the curbs of the street. It is composed of up to six main elements: the general purpose travel lanes/priority lanes, the center turn lanes/medians, buffers, bicycle space, parking, and drainage. Not all throughway elements are used in each cross section. The graphic representation of an all-inclusive throughway pictured below helps to distinguish the role that each element plays and to point out primary concerns that a street designer should keep in mind.

- General purpose travel lanes/priority lanes are the primary area for vehicle traffic circulation and refer to the lanes for through movement. Their design should incorporate a consideration of the primary vehicles that will be using a street: if this is larger vehicles, the dimensions of these lanes need to reflect that vehicle type. If the primary user of the street is passenger automobiles, the dimensions of these lanes can be narrowed to allow other components of the throughway and the street in general to serve a greater range of functions.

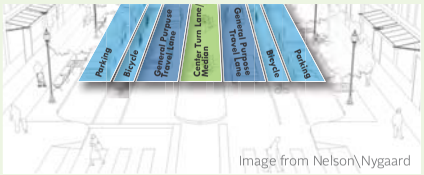


Image from Nelson\Nygaard

- Center turn lane/median is the auxiliary space separating general purpose lanes in each travel direction to allow the storage of turning vehicles. The general principle used in this guide is that either a median or a turn lane will constitute this space, if it is used, but not both.
- Buffers refer to the non-operable space that provides added separation between bicycles and adjacent travel lanes or parking. As shown below, not all dedicated bicycle facilities include buffers.
- Bicycle space refers to any dedicated space for bicycles including bike lanes, bike lane buffers. In shared lane environments, bicycles operate in general purpose travel lanes.
- Parking is provided as storage for cars that are not in operation and unloading/loading zones for delivery trucks and other private autos (e.g. taxis). Not all streets in KCDD provide for on-street parking, but is generally provided along streets serving commercial land uses or where private properties do not provide substantial space for off-street parking.

PEDESTRIAN ZONE

The fundamental organization of the space between the curb and the lot line, or pedestrian zone, is essential to a Complete Street. The pedestrian zone includes the following five elements or zones:

Image from Nelson\Nygaard

- Frontage zone: Area between the property line and pedestrian through zone that provides opportunities for temporary signs, planters, business-maintained plantings, and café seating.
- Pedestrian through zone: The primary passing and circulating area for pedestrians. This zone should be completely clear of permanent objectives (street furniture, utilities, street trees, etc.).
- Furniture zone: The first line of buffering between pedestrians and adjacent travel lanes. This is the appropriate areas to locate transit passenger facilities, street trees, utilities, planters/landscaping, sign poles, and additional street furniture (including bike share docking stations).
- Curb zone: A 6-inch wide curb.
- Enhancement/Buffer zone: Any instance where a parking lane may be flexibly used for expanded transit passenger facilities, in-street bicycle parking or bike share docking stations, landscaping/stormwater features, parklets, and curb extensions. Curb extensions effectively serves as additional furniture zone.

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QUALITY OF SERVICE PERFORMANCE STANDARDS

KCDD's tools for measuring the success of its transportation system should follow from the larger goal and objectives of the TOD Overlay Plan. The TOD Overlay Plan, and the decision to pursue Complete Streets in Kaka`ako, recognizes that transportation is a means to ensure HCDA and the community realize quality of life, health, economic, and various other principles and objectives established in Chapter 2 of the Plan. It is imperative that Kaka`ako's Complete Streets strategy measures the various ways the network of district streets supports broader KCDD goals and objectives. Using traditional measures of auto delay is counter-intuitive for urban Complete Streets and does not address the goals of the TOD Overlay Plan to accommodate more people and jobs in a dense urban district where people can walk, bike, and use transit. Success of this plan will decrease per capita demand for auto travel and put priority on the quality of service in the pedestrian and bicycle realms. Traditional vehicle level of service models were developed for application in suburban areas where auto was the assumed mode of access for all land uses.

The KCDD TOD Overlay Plan emphasizes quality of service for all modes in addition to level of service (delay) for vehicles.

Strategy CS7 Establish performance measures/standards and decision tools that will incorporate Complete Streets

In conjunction with future work to develop a comprehensive set of Complete Streets design standards, the HCDA will work with our partners (particularly DTS and HDOT) to establish a process that combines existing tools for measuring transportation performance (largely oriented toward measuring vehicle delay, volume, and capacity) with multimodal analysis tools. This performance measurement framework should balance quantitative tools with qualitative tools that reflect transportation outcomes and ensure that transportation investments contribute to vibrant, healthy, and economically productive streets.

A number of alternative performance measurement tools exist as a supplement or replacement to vehicle level of service (VLOS). Responsibility for setting performance standards should be a joint process between HCDA and the City and County of Honolulu. Examples of potential decision tools include:

- Site/project level performance measures (Multimodal Level of Service, checklists, crash and injury data)
- Transportation system level measures (annual counts, including miles of bicycle lanes added or repainted, blocks of new or repaired sidewalks, number of new or reconstructed accessible curb cuts, number of new street trees per year)
- Measurement (post-performance measure such as % reduction in crashes or reduced vehicle speeds in residential neighborhoods)
- Community-wide, long-term measures (mode shift, satisfaction surveys, health outcomes)

Action CS7.1 Work with DTS to adopt transportation quality and level of service metrics that reflect the development of a walkable, multimodal transportation network

VLOS standards historically are focused solely on vehicle delay times and may therefore have a detrimental effect on the implementation of safe, vibrant, walkable, community-oriented streets. Often, improvements or additions of non-vehicle capacity projects (such as widening sidewalks by reducing curb-to-curb width) may trigger a potential decline in modeled VLOS. If improvements that encourage people to travel in ways other than driving are always rejected because they will slow down motorists, then it will not be possible to encourage people to get out of their cars and HCDA may not

New York City is building Complete Streets that serve a variety of roadway users and provide measurable community benefits.
Image from Nelson\Nygaard

NEW YORK CITY DOT: MEASURING THE STREET: NEW METRICS FOR 21ST CENTURY STREETS

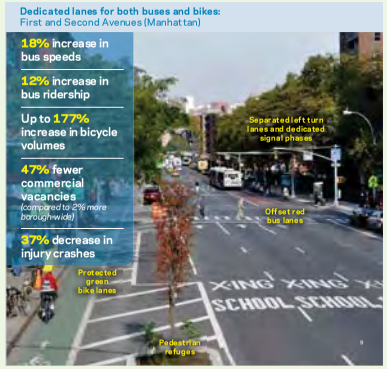
New York City's current DOT has gained a reputation for the most innovate and successful repositioning of its transportation infrastructure to vibrant, economically successful, and safe urban streets and public spaces. And if New York City DOT can successfully reprioritize space on Manhattan streets for pedestrians, bicycles, parklets, and street cafes, the rest of the nation's cities have to ask – "can't we do the same?"

Part of the New York success story is the adoption of a radically new way of viewing performance, based not just on how autos move and operated, but on how transportation investments affect users of all modes and the businesses and property owners that front city streets. Measuring the Street: New Metrics for 21st Century Streets categorizes strategies and metrics under goals to:

- Design for safety
- Design for all users of the street
- Design great public spaces

Metrics to measure success include public health benefits and economic return on investment for retail users in commercial corridors.

The full report can be found at: http://www.smartgrowthamerica.org/documents/cs/impl/ny-nyc-measuring.pdf



Images from NYC DOT

achieve its land use and economic goals for the KCDD. For example, the nation's most successful retail streets are often congested. This is both a sign of success – people want to be there – and a benefit to retailers since people in slow moving cars can better view shopping opportunities.

National practice in measuring transportation performance is evolving. The most recent Highway Capacity Manual (HCM) has made significant changes from previous editions, including a chapter dedicated to urban street facilities that couples level of service standards for automobiles, pedestrians, bicycles and transit users. Increasingly cities are looking to measure *quality* of the pedestrian and cycling experience and to measure street performance by capacity and delay for *people*, not vehicles.

Among the most important actions that many jurisdictions are now taking is to simply exempt development within dense, mixed-use districts from compliance to minimum vehicular level of service standards. In some cases, additional multimodal level of service standards are developed, in others an impact fee is assessed based on the size and/or trip generation from that development. These fees are then put toward completing the city or district's transportation plan. This strategy has the benefit of ensuring that a single, coordinated approach to managing transportation is taken and that capital projects are implemented in the most beneficial order of priority.

Heavy traffic on 5th Avenue in New York City does not deter shoppers from around the world
Image from Nelson\Nygaard

Bicycle counters like these in Copenhagen are increasingly being used in the US to measure bicycle demand on major travel corridors.
Image from James Scridland

MEASURING MULTIMODAL STREET PERFORMANCE

The San Francisco County Transportation Authority (SFCTA) proposed replacing the current LOS measure with a measure based on the net automobile trips generated (ATG) by a project, paired with a transportation impact mitigation fee (TIMF) program designed to mitigate the systemwide impacts of added vehicle trips. This methodology offers a citywide approach to measuring and mitigating traffic impacts, rather than looking at one project and one intersection at a time. Because there is traffic congestion throughout San Francisco's street network, any project that adds a single vehicle trip would be determined to have a significant traffic impact.

Projects that do not add vehicle trips, like a rail line, bike lane or sidewalk widening, would not be considered to have any traffic impact, even if the project reduced vehicle capacity in a specific location or corridor. The ATG methodology is currently under evaluation and it is unclear if and when it will be implemented. The proposed methodology and fee structure would need to be adopted by the Planning Commission through an ordinance that replaces auto LOS as a measure of environmental impacts with the ATG measure, coupled to the TIMF program.

Other places that have relaxed minimum standards for VLOS or adopted multimodal level of service standards include:

- Livermore, CA
- Redwood City, CA
- San Jose, CA
- San Francisco, CA
- Fort Collins, CO
- Montgomery County, MD
- Fairfax County, VD
- Cambridge, MA
- Massachusetts DOT
- Oregon DOT
- Florida DOT

The table on the following page describes other measures of transportation performance being used to measure performance of our streets and transportation networks.

MULTIMODAL TRANSPORTATION PERFORMANCE MEASURES

Feature	Definition	Indicators
Delay	Consider person delay rather than vehicular delay	▪ Aggregate delay of all transportation users in a corridor or corridor segment during a set time period
Capacity	Capacity for a street to move people or intersection to accommodate person throughput	▪ Capacity of a street cross section in terms of persons moved per hour (can exclude pedestrians) ▪ Intersection person throughput at a peak hour (can exclude pedestrians)
Network continuity and connectivity	Whether sidewalks and paths exist, and connect throughout an area	▪ Portion of streets with non-motorized facilities ▪ Length of path/non-motorized facility per capita ▪ Network connectivity and density (intersections per square mile)
Network quality	Whether sidewalks and paths are properly designed and maintained	▪ Sidewalk and path functional width ▪ Portion of sidewalks and paths that meet current design standards/in good repair
Road crossing and intersection design	Safety and speed of road crossings	▪ Road crossing widths ▪ Motor vehicle traffic volumes and intersection design speeds ▪ Average pedestrian crossing time ▪ Quantity and quality of crosswalks, signals and crossing guards
Pedestrian and bicycle protection from traffic	Separation of non-motorized traffic from motorized traffic, particularly high traffic volumes and speeds	▪ Distance between traffic lanes and sidewalks or paths ▪ Presence of physical separators, such as trees and bollards ▪ Speed control
Congestion and user conflicts	Whether sidewalks and paths are crowded or experience other conflicts	▪ Functional width of sidewalk and non-motorized paths ▪ Peak-period density (people per square foot) ▪ Clearance from hazards, such as street furniture and performers within the right-of-way ▪ Number of reported conflicts among users ▪ Facility management to minimize user conflicts
Sense of Security	Perceived threats of accidents, assault, theft or abuse	▪ Reported security incidents ▪ Quality of visibility and lighting ▪ Hours of street activity and/or retail establishments
Wayfinding	Guidance for navigating within the station and to nearby destinations	▪ Availability and quality of signs, maps and visitor information services
Weather protection	User protected from sun, wind, and rain	▪ Presence of shade trees and awnings ▪ Frequency and design of waiting and resting places
Cleanliness	Cleanliness of facilities and nearby areas	▪ Litter, particularly potentially dangerous objects ▪ Graffiti on facilities and nearby areas ▪ Effectiveness of sidewalk and path cleaning programs
Attractiveness	The attractiveness of the facility, nearby areas and destinations	▪ Quality of facility design ▪ Quality of nearby buildings and landscaping ▪ Air and noise pollution experienced by cyclists and pedestrians ▪ Community cohesion (quantity and quality of positive interactions among people in an area) ▪ Number of parks and recreational areas accessible by non-motorized facilities
Economic vitality	Ability to retain, support, and advance retail and commercial performance	▪ Retail sales per square foot ▪ Sales tax revenue generated ▪ Commercial vacancies ▪ Number of visitors
Public health	Health benefits achieve from increased physical activity (active transportation), safety improvements, and reduced emissions	▪ Collisions and injuries to motorists and other vehicle occupants, pedestrians, cyclists, and motorcyclists ▪ Number of ADA compliance projects constructed annually ▪ Worker absenteeism, efficiency, and productivity (obtained through employer surveys) ▪ Increased walking and bicycling levels ▪ Air quality monitoring

Adapted from multiple sources including: NYCDOT's Measuring the Street: New Metrics for 21st Century Streets (2012) and Victoria Transport Policy Institute's Multi-Modal Level-of-Service Indicators Tools For Evaluating the Quality of Transport Services and Facilities (December 2012)

STRATEGIES AND TOOLS TO IMPLEMENT COMPLETE STREETS AND INTERSECTIONS

Strategy CS8 Reallocate street space to better move people and activate KCDD pedestrian spaces

The success for the TOD Overlay Plan relies on an effective partnership between HCDA and DTS to identify and implement projects that reallocate street space for more multimodal and livable uses. Several street design tools should be considered to achieve Complete Street design objectives in Kaka`ako, including road diets/lane reconfiguration, shared street design, and repurposed parking lanes. The effectiveness of these tools will be evaluated in appropriate contexts in future transportation analysis in the KCDD.

ROAD DIETS

Case Study: Along St. Louis' South Grand Blvd., traffic volumes ranged between 19,500-29,000vpd prior to a road diet and streetscape project. Before and after analysis of traffic showed very little change in volume, but noticeable speed and noise reductions.
Image from Nelson\Nygaard

Focusing on existing infrastructure, road diets, or lane reconfiguration projects, suggests the idea that some roads carry more 'weight,' or vehicular capacity, than they need to be functional and livable. Road diets improve multimodal safety by converting underutilized vehicle space in a fixed right-of-way to space serving other users of the street, such as parking vehicles, bicyclists, and pedestrians. Road diets typically convert four-lane cross sections (i.e. four lanes with no median between the two directions of travel) to three lane sections (one travel lane in each direction with bike lanes and either a two-way left turn lane or a similar amount of space to provide left turn storage lanes as needed).

Not all Kaka`ako streets should be considered as road diet candidates. The 4-to-3 conversion is most effective on roads with average daily traffic of up 15,000-20,000 vehicles per day (vpd) and those that have a high potential to induce vehicular travel. This threshold is increased to 25,000 (vpd) for 5-lane cross sections. Based on existing volumes and the anticipated function and demand of KCDD streets, Ward Avenue and potentially Auahi Street (Diamond Head of Ward Avenue) should be considered for lane reallocation.

SHARED STREET DESIGN

Image from Nelson\Nygaard

Shared streets, also referred to as woonerfs, slow zones, or home zones, are narrow, often curbless street connections that reduce or remove segregation between pedestrians, bicyclists, cars, and delivery trucks. Vehicular traffic is calmed to low speeds (10mph speeds or less) by placing trees, planters, parking areas, and other obstacles in the street's common space. HCDA should implement shared street designs on streets serving delivery and parking access traffic and in areas of the district where heavy pedestrian volumes are expected and auto traffic is de-emphasized. The TOD Overlay Plan suggests this approach on many of the Local Streets, particularly on new streets serving mixed use developments.

ACTIVATED ENHANCEMENT/BUFFER ZONES

Image from Flickr user Shelley Mags

The parking lane provides opportunities to expand the pedestrian realm, especially streets that will not be rebuilt or extensively landscaped. At strategic locations, use of the parking lane for parklets, seating, landscaping, restaurant use, bike share docking stations or in-street bicycle parking corrals can be used to provide visual interest, resting areas for pedestrians, and additional transportation-related storage. HCDA will work with DTS to reprogram a limited number of parking stalls with more active uses.

SAN FRANCISCO'S PARKLET PROGRAM

Since 2010, the City of San Francisco's Pavement to Parks Program has pioneered the conversion of parking lane space to "parklets". A parklet repurposes part of the street into a space for people, making the street more beautiful and provide public space, even when permanently widening sidewalks is not an option. They can provide space for seating, landscaping, public art and other amenities. They are typically paid for and maintained by nearby residents, businesses, or community organizations.

Goals of the program include:

- Providing a fast and cost-effective way to beautify the streetscape and improve the public realm
- Encourage walking by enhancing the pedestrian environment
- Providing space to sit, relax, and plan
- Supporting local business

More information on the Parklet Program is available in the San Francisco Pavement to Parks Program Parklet Manual and the Business/Resident Application to Request a New Parklet

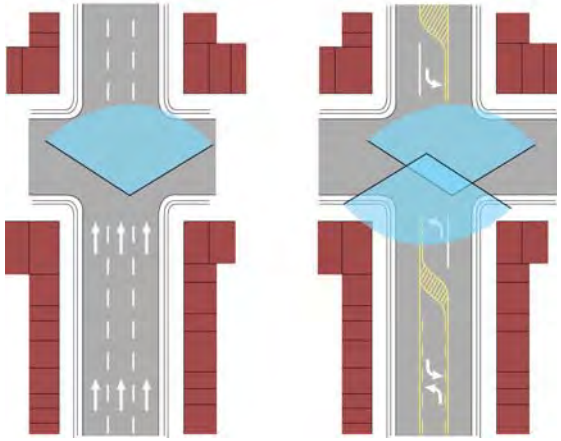
Two examples of parklets in San Francisco's Mission District. Parklets extend the pedestrian realm and help to enliven communities and their retail spaces.
Images from Nelson\Nygaard

Strategy CS9 Strategically convert key multimodal streets from one-way to two-way operation

Converting vehicular flow of one-way streets to two-way operations is another method of designing streets to be safer and offer improved access to destinations in Kaka`ako. Historically, two-way streets were converted to one-way operations to increase vehicle-moving capacity—particularly during peak travel periods. The primary modal beneficiary of this approach is auto movement at the expense of other modes and uses. For 20-22 hours of the day, the need to move large traffic volumes is not as urgent; yet one-way streets continue with one-way flow and only allow one direction of visibility, as illustrated in Figure 6-6. One-way streets are less conducive to successful business corridors, largely because they limit visibility to a single direction and at a given time of day offer less exposure to businesses. One-way streets tend to have faster vehicle traffic speeds, which means motorists spend less time observing the environment around them and more time "zipping by" the retail corridor. Conversion is desirable from a safety standpoint, as well, as two-way streets operate at appropriate speeds for urban environments where there are higher volumes of bicyclists and pedestrians—especially along segments of Kaka`ako streets that will experience substantial residential growth.

To achieve roadway facilities that offer a balance of mobility, access, and accommodations that establish more attractive, safe and livable conditions, HCDA will coordinate with DTS to evaluate the viability of converting certain one-way streets to two-way operations. For example, the Pensacola/Piikoi couplet is identified as a possible corridor for future conversion pending an in depth evaluation.

Figure 6-6 Visibility Impacts of One-Way and Two-Way Roadway Operation



One-way streets allow only one principal direction of visibility for motorists on a street (left), meaning that businesses will not be seen from an opposite direction as they would on two-way streets (right).
Image from Nelson\Nygaard

Strategy CS10 Redesign and operate intersections to accommodate all modes and reduce conflicts

Action CS10.1 Design intersections to be compact and limited in complexity, where possible.

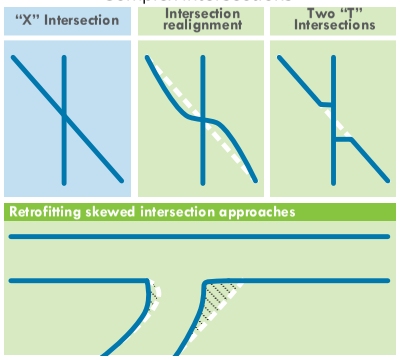
As shown in Figure 6-7, intersections in Kaka`ako range between in size and complexity. In a complete streets environment, compact intersections with tight geometries are preferable to complex intersections, to reduce conflicts between pedestrians, bicyclists and auto drivers. Ideally intersections should have three or four approaches (or legs), each generally forming a right angle with the street it connects into. Complex intersections might have raised medians and turn lanes, but the defining features of that make complex intersections less attractive from a safety and operations standpoint are multiple legs (over 4) and skewed angles.

Figure 6-7 Range of Intersection Size in Kaka`ako

Examples of the range of intersection geometries in the KCDD at Punchbowl/Kapiolani (left) and Coral/Auahi (right).
Image from Google

Intersections should be easily negotiated by pedestrians and bicycles, and traffic approach speeds should be managed, where possible. Complex intersections are not unalterable, and more complete intersection designs can be achieved throughout Kaka`ako. A mixture of pedestrian refuge islands, curb extensions, signal improvements, and signs can help to break up crossing distances and limit the number of possible concurrent conflicts. Skewed intersections like Auahi and Ward can be realigned or re-networked into simplified junctures or a series of T-intersections. Y-junctions can also be squared off into a T-intersection as well. These techniques are summarized in Figure 6-8.

Figure 6-8 Different Approaches to Simplifying Complex Intersections



Source: Nelson\Nygaard

Action CS10.2 Ensure crossings throughout the KCDD are as short, direct, and level as possible.

Whether at an intersection or a mid-block location, crossings should be as short and as direct as possible. Human nature will result in pedestrians taking the shortest and most direct route across an intersection, regardless of the traffic engineer's intent – it is therefore essential that the direct path be made the safest path in intersection design. Curb extensions, mid-block crossings, pedestrian refuge islands and any other facilities that break crossings into more manageable crossing distances will improve the pedestrian experience.

Pedestrian crossings in Kaka`ako should be made at grade wherever possible. Grade-separated crossings are almost always unsuccessful at moving people across the street in the most direct path, except under one of four conditions:

- Crossing over or under a freeway or divided highway
- Connecting directly to specific land uses
- Providing a trail crossing where the trail is roughly perpendicular to the road
- Connecting on at least one side to a location where people want to be at the elevation of the structure (e.g. where one end is an elevated rail station)

Unless they specifically satisfy one of these four conditions, bridges and underpasses simply do not work to get people from the sidewalk on one side of the street to the sidewalk on the other side of the street. Fences and barricades can improve behavior, but are often ignored or modified to maintain the most direct route to a destination.

Action CS10.3 Apply principles of universal design to ensure street environments and junctures are legibly and comfortably designed for pedestrians of all ages and abilities.

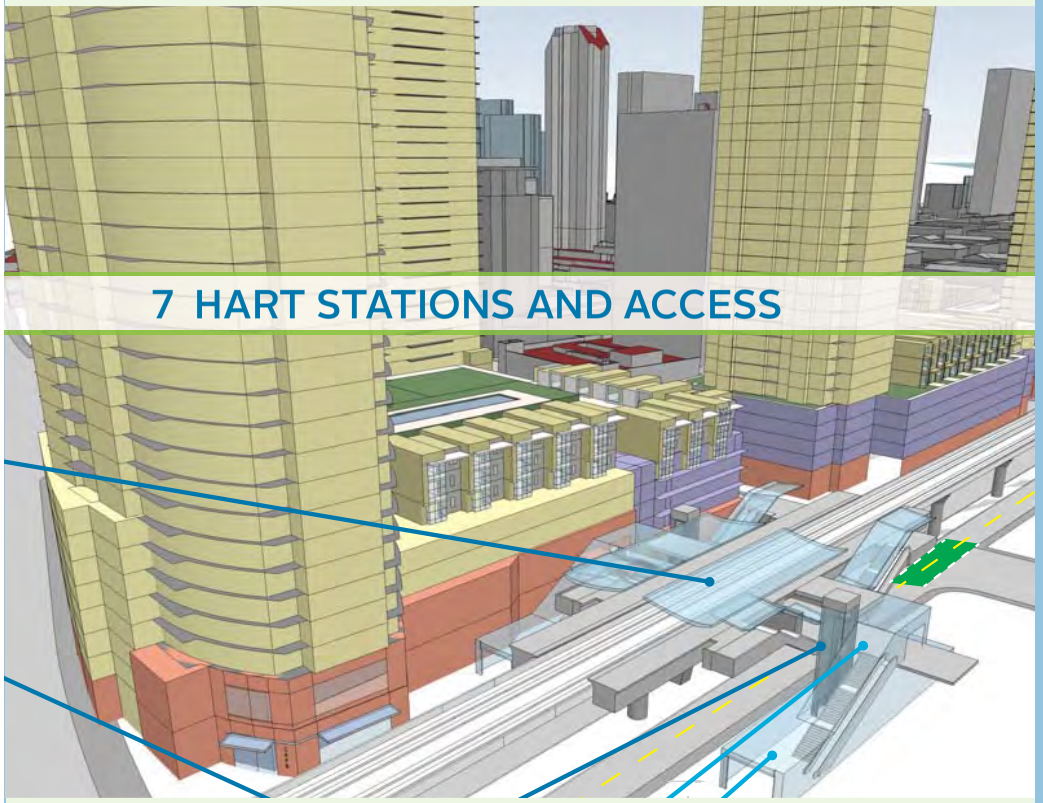
Universal design is a design that is comfortable for users of all ages and abilities, including persons with disabilities. Universal design principles applied to street design include street crossings that can be comfortably navigated by older and slower walkers, curb cuts that can accommodate baby strollers, rolling suitcases, and a variety of mobility devices, and wayfinding that is clear and intuitive to all users. All streets in Kaka`ako will be designed with principles of universal design. Additional detail on universal accessibility is discussed in Chapter 5.

RECOMMENDED RULE CHANGES FOR KAKA`AKO

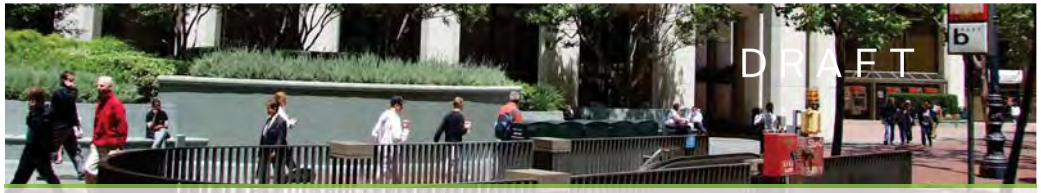
The following rules changes are recommended for various roadway and pedestrian design elements of the Mauka/Makai Rules. Additional rule changes will be proposed upon completion of HCDA's forthcoming Complete Streets Design Standards.

- **Regulation CS5.1:** Incorporate the Complete Street types as part of §15-217-38 through 39: The Thoroughfare Plan rules currently focus heavily on the pedestrian realm, so the rules should reflect street types design options, modal trade-offs, and general design guidelines.
- **Regulation CS5.2:** §15-217-39-D-1-7 updated to include allowances and design guidance for the "shared street" designs as part of the Local Streets street type (completed following completion of future HCDA Complete Streets design guide).
- **Regulation CS5.3:** To ensure predictable traffic movement and limit conflicts with pedestrians, parking access lanes, alley or any other Local Street types should be permitted to operate as one-way connection. Additional language should be added to §15-217-63 to clarify this provision.
- **Regulation CS7.1:** In a new section of the Rules, HCDA and DTS should jointly adopt and implement transportation quality and level of service metrics and data collection processes to track the benefits and impacts of implementing the Complete Streets strategy (completed following development of HCDA Complete Streets design guide)..
- **Regulation CS8.1:** Amend §15-217-39-D-1-7 to include the enhancement/buffer zone as part of the sidewalk zone nomenclature and include design elements and programming such as parklets, bike share docking stations, and in-street bike parking corrals.
- **Regulation CS10.3:** Include a new section in the Rules that specifies universal design guidelines based on the recently completed Public Rights-of-way Accessibility Guidelines (PROWAG).

DRAFT



7 HART STATIONS AND ACCESS



7 HART STATIONS AND ACCESS

Integrating Rapid Transit in the Kaka`ako District

The Honolulu Authority for Rapid Transit project is a piece of civic infrastructure that will cut an elevated swath across the center of Kaka`ako. HART plans to contract for station design of two stations within the Kaka`ako District (Civic Center and Kaka`ako) along with the six other stations that comprise the Diamond Head segment of the HART alignment including Downtown and Ala Moana. This Chapter provides an outline of design strategies, opportunities and overall vision for the two Kaka`ako District Stations (Civic Center Station and Kaka`ako Station) as well as provides opportunities for the Aloha Tower parcel under HCDA jurisdiction (neighboring to the Downtown Station). It also outlines design guidance for preferred future station and alignment design, and a series of access strategies. HCDA will collaborate with HART to ensure that these design principles and strategies are considered during the transit system's implementation process to help make HART a local asset (rather than a encumbrance) in the transitioning Kaka`ako District.

Elements of Station Access

Station access includes the total travel experience from a transit passenger's origin (e.g., home) to his or her final destination (e.g., work, school, entertainment). Access includes the physical act of travelling to the transit station as well as the psychological ease of navigating the route to get there, regardless of the mode taken. Given the relative simplicity of driving a personal car directly from origin to destination, the success of a new transit investment depends on understanding the total transit experience to maximize ridership by making transit competitive and compelling to as many potential riders as possible. To this end, this chapter provides a set of overarching station access principles and specific strategies and actions to ensure Civic Center and Kaka`ako stations are focal points of the KCDD community.

Station Area Principles: Place, People, and Performance

The three major principles that guide the TOD Overlay Plan approach to integrate the HART stations into the neighborhood are *People*, *Performance*, and *Placemaking*. Design objectives for the public realm related to *People* optimize convenience and comfort for all transit users by simplifying travel to/from and within the station area and adding human-scaled design elements. *Performance* objectives foster seamless multimodal connections. Lastly, *Placemaking* principles are tied to creating opportunities for context-sensitive design solutions, complete with active public spaces, and transit-friendly land uses. Principles for the Kaka`ako, Civic Center and Downtown Station locations are presented in Figure 7-1. Figure 7-2 illustrates how selected principles might be considered at the Civic Center Station.

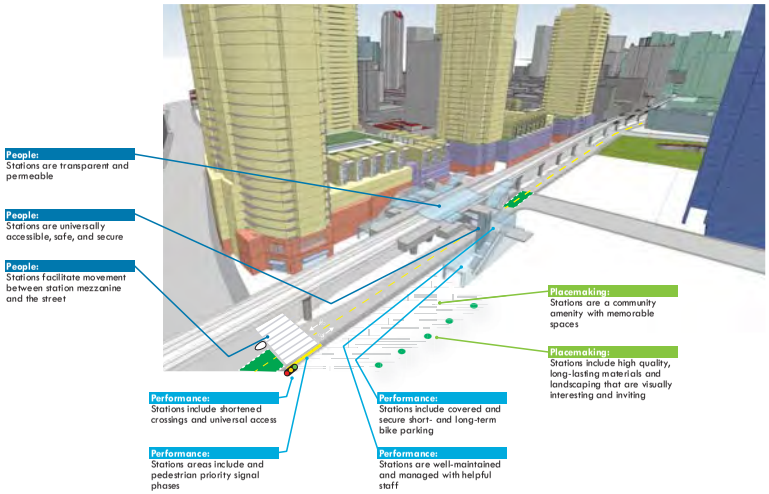
Access Hierarchy

All modes of station access cannot be given equal priority. At every station, there is limited space and scarce funding available for access improvements. Recognizing these constraints, the proposed station access hierarchy illustrated below establishes priorities for access improvements and policies. The station access strategies and actions described in this Chapter are based upon this hierarchy.

Figure 7-1 Station Access Principles and Objectives

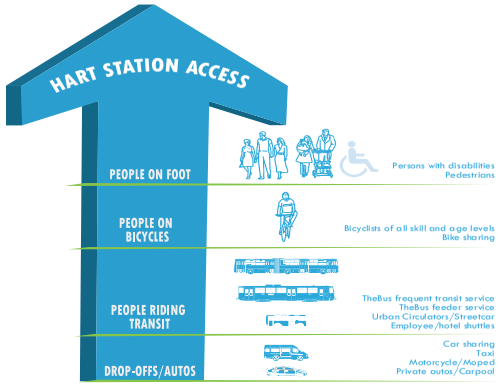
Principles	Objectives
PEOPLE	• Station access should be simple and intuitive, with a legible layout for street-to-train, bus-to-train, and station-to area destinations. • Station siting maximizes pedestrian connectivity to the street and adjacent uses while considering pedestrian safety issues and operational/functional needs. • Public realm designs adjacent to the station provide generous space for pedestrian movement, weather protection, comfortable furnishings and Crime Prevention Through Environmental Design (CPTED) elements. Design includes street-level activation and high quality lighting to make under-guideway environments more comfortable. • The station addresses and balances the needs and hierarchy of all modes, including pedestrians and cyclists, transit, and vehicular travel.
PERFORMANCE	• The station area eliminates safety conflicts between roadway users and reduces ground transportation collision rates. • Efficient bus transfer locations are developed and kiss-and-ride layout is planned and designed to minimize impacts with other modes. • The station includes secure bicycle parking and storage facilities and convenient bike-on-transit integration. Additionally, all streets in the station area will provide a safe and comfortable space for cyclists.
PLACEMAKING	• Station sites are community assets designed to enhance local environment. • Station areas integrate with transit-friendly development projects, generous public realm, public gathering areas, sidewalks and activated streetscapes. • Elements to humanize the scale of new infrastructure are included where feasible such as distinctive architectural treatments, public art, and under alignment landscape.

Figure 7-2 Station Access Principles at Civic Center Station



The proposed access hierarchy prioritizes pedestrians above all other modes. Walking to transit is the most cost-effective, environmentally friendly, and equitable form of station access. Furthermore, every transit rider is a pedestrian for at least part of their trip, even if it is only from the bus drop-off to the station platform. Bicycling is the second highest access priority. Similar to walking, its cost and environmental impact is minimal. It remains a highly equitable form of transportation even if it may not be an option for all users. The remaining access modes are prioritized based on their increasing cost, space demands, and environmental footprint. Bus transit access to HART stations will be of critical importance; however, major bus transfer points are planned outside the district to the east and west at the Ala Moana and Downtown Stations.

Figure 7-3 HART Station Access Hierarchy



Access Demand

Station access needs are determined based on station access demand by mode. Opening day ridership projections for the Kaka`ako and Civic Center stations are 3,320 and 3,930 respectively. In both cases, approximately 80% of these transit trips are expected to originate on foot and by bicycle, thereby increasing the importance of adequately designed pedestrian and bicycle facilities. Furthermore, given that both station areas are planned for significant redevelopment, multimodal access demand should be based on future build-out conditions.

An estimate of 2035 ridership is compared to opening day. Both stations are expected to see ridership growth of over 500% in the 20 year time period. These projections do not include any additional growth allowed under the TOD Overlay Plan scenario.

Figure 7-4 Opening Day and 2035 Ridership at KCDD HART Stations

	Civic Center			Kaka`ako		
	2035	Opening	%Change	2035	Opening	%Change
AM and PM Peak Periods	5,878	880	568%	5,348	570	838%
Total Daily	7,168	3,930	82%	7,771	3,320	134%

Note: Peak Period is defined as 4 hour AM and 4 hour PM peak; 2035 projections based on OMPO Modeling for RTP (2035 projection), may differ from official HART ridership forecasting

Overall Access Strategies

Helping passengers get to the rapid transit stations is a shared responsibility: the City/County of Honolulu, HCDA, and HART must work together to ensure that the stations themselves are well-integrated with the surrounding areas, and that passengers using all modes of transportation have safe, comfortable, and convenient paths of travel to and from the station. While HART is responsible for the design of the stations themselves, this section outlines a set of strategies and actions for the areas around the station. Streets, paths, signage, connections to feeder transit, buildings in the station area: these are the elements that tie the station together with the surrounding community.

This section describes strategies that the HCDA can implement, or advocate for, as HART station and adjacent developments and streets are designed. In addition, the specific recommended station area actions listed below should be implemented by the appropriate agency depending on the location and nature of the improvement.

Strategy SA1 Ensure high-quality pedestrian access to transit stations.

Walking to and from transit stations should be safe, comfortable, and inviting. The key strategies for creating a great pedestrian environment are discussed in detail in Chapter 5 (Mobility and Access). In addition, important considerations that apply specifically to transit access include:

- Improve street connectivity in the half mile area around the station to shorten walking distances to and from the transit station and increase the total population within walking distance of the station. More detail is provided in the Walking section of Chapter 5.
- Prioritize pedestrian crossings and minimize conflicts with other modes. Assess intersections and street crossings along preferred routes of pedestrian travel to and from the station and adjust designs to prioritize pedestrian movement. More detail is provided in the Walking section of Chapter 5.
- Provide adequate capacity for passenger flows within and outside the station, focusing on support of development potential. Ensure sidewalks and walkways are sufficient in size to accommodate a number of pedestrian activities including passenger flows, sitting, standing, leaning, and queuing.
- Promote transit-oriented development close to stations, using good design to ensure amenities

for pedestrians, lively street frontages and "eyes on the street." More detail is provided in the Walking section of Chapter 5.

Strategy SA2 Maximize feeder transit connectivity.

High-quality connections between transit routes can dramatically improve the usefulness of the transit system for passengers. The station area should be configured to ensure a seamless connection between feeder bus routes and the rail line. Key considerations include:

- Ensure that roadways in the station area meet geometric design requirements for transit vehicles.
- Ensure adequate transit and shuttle bay space to promote efficient intermodal transfers. Space requirements include both pick-up and drop-off bays and layover and recovery areas for routes that terminate at the station.
- Position bus stops as close as possible to transit station entrances, and ensure safe paths of travel to bus stops and the station.
- Provide a comfortable, safe waiting environment for intermodal transfers, including information about bus routes and schedules.

Pedestrians have direct access to either side of the street from the Metrotown Station on Vancouver's SkyTrain system.
Image from Nelson\Nygaard

Strategy SA3 Provide bicycle connectivity and storage.

Bicycle travel supports transit by extending the reach of the transit system; while few passengers will walk more than half of a mile to reach transit, most bicyclists are willing to travel up to three miles to reach high-frequency transit services. More detail on bicycling accommodated in Kaka`ako is provided in Chapter 5. Listed below are key principles for promoting bicycle access to transit stations:

This high-quality bus stop provides access to bus service immediately adjacent to a SkyTrain station in Vancouver.
Image from Nelson\Nygaard

- Provide direct, safe and well-marked on-street bicycle facilities at HART stations.
- Provide secure, conveniently located bicycle parking facilities to meet demand, including both short-term and long-term bicycle storage. Long-term bike parking should be provided in fully enclosed cages, which also provide visibility from the outside to reduce theft or tampering.
- Provide space for bicycle sharing. Bike sharing programs can be designed to meet these "last mile" connections by providing convenient and affordable access to bicycles for shorter trips.
- Design and build stations to allow bicycle access to trains. Some rail systems allow cyclists to bring their bicycles on board, and others do not. While HART will weigh many factors in determining whether bikes should be allowed on-board trains, stations should be designed to accommodate bicycles in case they are permitted on trains in the future.

Traditional staple racks on the mezzanine level of a BART station are well utilized as they are weather-protected and in sight of security personnel.
Image from Nelson\Nygaard

CASE STUDY: BAY AREA RAPID TRANSIT BICYCLE ACCESS PLAN

In 2012, BART conducted a comprehensive assessment of bicycle parking at its many stations through the San Francisco Bay Area. The assessment supports a strategy to increase bicycle access mode share from 4% to 8% of all access trips to BART. The agency estimates that bicycle access is a key strategy to increase ridership and provide better access to regional transit at the lowest cost and with the least environmental impacts. The effort determined that bike access is already trending upward – between 1998 and 2008, BART's bicycle access rate increased by 69%, while daily ridership increased by just 27% during the same period. Looking at more detailed analysis, neighborhoods more comparable to Kaka`ako saw increases in bike access of well over 100% in the same period.

Stacked bike parking inside a BART station.
Image from Nelson\Nygaard

The BART inventory found that while there was unused bicycle parking throughout the system, there were shortages of supply for covered, indoor, and secured parking, particularly parking located inside the systems fare gates and in conveniently located lockers. The BART story shows that getting the amount of bike parking right is only half the challenge, making sure it is safe, secure, and conveniently located to the platform is also critical.

A cyclist with his bicycle crosses the Frasier River on Vancouver's Canada Line.
Image from Nelson\Nygaard

Strategy SA4 Provide for and manage vehicle access to transit stations.

A taxi serving Bay Area Rapid Transit's elevated Daly City Station.
Image from Nelson\Nygaard

While the KCDD HART stations will be designed primarily for pedestrian and bicycle access, it must be recognized that some passengers will arrive by automobile. While the stations will not provide dedicated park-and-ride facilities, transit passengers may use taxis, be dropped-off or picked-up at the station by other drivers, or drive themselves and park in private parking facilities or on-street. Key principles for accommodating and managing vehicle access include:

- Provide adequate space for drop-off/pick-up to proceed comfortably and in an orderly manner. More space may be required than is indicated in HART Station Access Plans for the two stations.
- Locate transit passenger drop-off/pick-up and taxi areas so that vehicle movements do not conflict with bus traffic, other traffic, or pedestrian movement in the station area. Ensure passengers arriving by private vehicle are not given "front door access" at the expense of other modes.
- Monitor transit passenger parking on-street in the areas around the stations, taking steps to regulate spillover parking into residential areas when necessary.
- Consider steps to allow transit passengers to use underutilized parking in the station area. This may include conversion of some time-limited parking to longer-term paid parking (as discussed in Chapter 8), or conversion of some private off-street accessory parking to publicly-available shared parking.

Strategy SA5 Ensure clear wayfinding in the station area.

HCDA and HART can work together to ensure a legible station area that includes both clear and consistent signage and easy-to-navigate paths of travel. Wayfinding is discussed in detail in Chapter 5. Key elements of the wayfinding strategy that apply specifically to station access include:

- Design the station area so that passengers can quickly and easily orient themselves during the journey between the fare gates and the bus stop, parking lot, drop-off zone or bicycle racks, or the sidewalk network of the local jurisdiction.
- Coordinate with HART and the City and County of Honolulu to develop station signage consistent with system-wide sign types, locations, colors, fonts, and symbols.
- Expand the traditional scope of transit wayfinding devices by including signage and maps directing passengers to bike facilities, major pedestrian routes and station area attractions such as Blaisdell Center, University of Hawai`i School of Medicine, and Ward 16 Theatres.
- Locate passenger information and maps outside the stream of dominant passenger flows to minimize bottlenecks and pedestrian congestion.

Strategy SA6 Provide for universal access to transit stations.

Transit stations and station areas should be designed to be accessible to people of all abilities. By designing according to principles of universal access, station areas can welcome people with reduced mobility, as well as visual and hearing impairments. They also become easier to access for people with strollers or young children, luggage or large bags, and shopping trolleys or bicycles. More detail on

CASE STUDY: TRANSIT WAYFINDING STANDARDS

TransLink, Vancouver, BC's regional transit provider, adopted its Wayfinding Standards Manual in 2010 to establish a clear and consistent practice for its wayfinding devices and tools. The intent of the Manual is to meet three key objectives:

- Encourage multimodal journeys
- Provide consistent information
- Deliver usable, suitable and manageable information.

To meet these objectives, the standards adhere to the following principles:

- Provide seamless information
- Understand complex journeys
- Be predictable
- Name the places
- Utilize consistent codes
- Progressively disclose information
- Don't make directions complicated
- Provide just the right amount of information
- Ensure information has integrity
- Help riders learn the system
- Use an appropriate tone of voice

Symbol-Based Wayfinding signage *(MAX rail system, Portland Oregon).*
Image from Nelson\Nygaard

Signage directs passengers at Vancouver TransLink's Metrotown Station.
Image from Nelson\Nygaard

accessibility for pedestrian facilities is provided in the Walking section of Chapter 5. Key elements of the universal access that apply specifically to station access include:

- Take special care to ensure that streets and intersections within 0.5 miles of each transit station are fully accessible for pedestrians with disabilities, including adequate curb ramps, clear paths of travel, and safe crossings. Incorporate audible signals into all station area signalized intersections to assist pedestrians who are blind or low vision. All new signals should also include pedestrian countdown timers to assist pedestrians in understanding how much safe time they have to cross the street.
- Reduce barriers and vertical obstructions. Minimize the number of level changes required to complete a trip, and when level changes do occur, provide both elevators and escalators.
- Provide fully accessible bus stops, as defined by the Americans with Disabilities Act, and provide adequate bays for paratransit vehicles.
- Provide information in a variety of media types to cater to the needs of the visual, hearing, developmental, and mobility-impaired.

Accessible Elevator (New York MTA Utica Subway Station).
Image from Nelson\Nygaard

Station-Specific Access Strategies and Actions

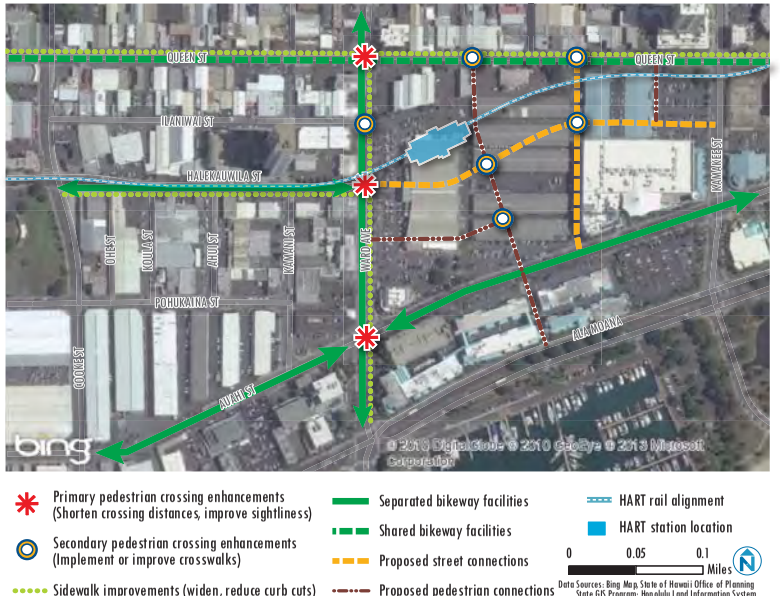
This section includes specific actions that HCDA and the City should undertake to implement the strategies outlined in the previous section for the three HART stations: Kaka`ako Station, Civic Center Station, and Downtown Station at the Aloha Tower Special District.

Strategy SA7 Implement actions specific to the Kaka`ako Station.

Located just off of Ward Avenue, the Kaka`ako Station is the first station after the alignment leaves Halekauwila Street as it begins to veer southeast to meet with Kona Street. It will be embedded within a mixed-use district with an eclectic blend of retail, entertainment, industrial and high-density residential buildings. Key potential transit attractions include the Neal S. Blaisdell Center, University of Hawai`i School of Medicine, Ward Center, and the Kaka`ako Waterfront and Ala Moana Beach Parks. Similar to Civic Center, the attractions are not directly adjacent to the transit station and will require visitors and employees to walk, bike, or transfer to a bus or shuttle to reach their final destinations. Much of the area surrounding the station is planned for major redevelopment by the Ward Neighborhood Master Plan. Existing low-intensity land uses will be replaced by mixed-use residential development with FAR ranging from 9 to 12.

The strategies and actions below are designed to improve these connections and enhance the overall accessibility of the station. They consider the current condition and the transformation of the surrounding blocks of within the TOD Plan horizon.

Figure 7-5 Kaka`ako Station Access and Circulation



Action SA7.1 Increase building setbacks along Ward Avenue to ensure sufficient sidewalk widths as redevelopment occurs

Based on build-out projections and AM peak demands, sidewalks and walkways at, or near, the station will need to be 15 feet wide minimum, 20 feet preferred. In most locations along Ward Avenue, a minimum of 5 feet of additional setback is recommended to achieve the minimum 15 feet sidewalk widths. For a comparison, sidewalks on North America's most iconic, major transit and pedestrian corridors, such as Market Street in San Francisco, are 30 feet or more in width.

Generous sidewalks near a SkyTrain Station in Metro Vancouver.
Image from Nelson\Nygaard

Action SA7.2 Design waiting areas and station plazas to safely accommodate potential crush loads during peak periods of travel and before and large events.

The Kaka`ako Station is likely to be the transit station of choice for visitors to the Blaisdell Center's many annual events. If designed properly, the high capacity transit connection can dramatically reduce the need for parking at such events and mitigate traffic congestion. A full capacity stage event in the arena, for instance, can accommodate 8,800 attendees (up to 17,000 in the arena proposed in the TOD scenario). Assuming even a modest transit mode split of 10% would bring up to 900 passengers to the station, approaching double the peak AM demand. Given the capacity of the two-car train sets, passengers may have to wait through one or two trains before they are able to board. To help ease potential passenger frustration, waiting areas and street-level plazas will be designed to encourage short-term public congregation and dwelling.

Action SA7.3 Introduce pedestrian countdown signals at all signalized intersections along Ward Avenue.

Pedestrian countdown signal heads allow pedestrians to judge if they have sufficient time to cross a street. They are particularly useful to populations requiring additional crossing times including the disabled, elderly, and adults accompanying small children. In addition to reducing pedestrian crossings on red and vehicle-pedestrian collisions, they have been shown to increase driver caution when approaching these intersections.

Action SA7.4 Install a signalized crossing with countdown signal heads on the mauka side of the intersection of Ward Avenue and Halekauwila Street.

The proposed crosswalk will provide a more direct connection from the west to the station entrance plaza for pedestrians and transferring bus passengers.

Action SA7.5 Enhance the pedestrian crossing at the intersection of Ward Avenue and Ilaniwai Street.

The intersection of Ilaniwai Street and Ward Avenue is unsignalized and lacks a crosswalk on the Mauka side of the intersection. Given that a full signal is unlikely warranted, this crossing could be improved with zebra crosswalks on both sides the intersection and pedestrian actuated rectangular rapid flashing beacons (RRFB). In an evaluation conducted by the Federal Highway Administration (FHWA), RRFBs improved vehicle yield/stop rate from under 2% to 85%.

Action SA7.6 Provide new direct pedestrian connections from the Ward Neighborhood Master Plan's Central Plaza to the station.

Since the Ward Neighborhood Master Plan assumed a different location for the station, it has planned building locations that currently block pedestrian access from its Central Plaza to the future station site. As redevelopment occurs, Halekauwila Street should be extended through Ward Avenue to provide direct multimodal access between the station and the Plan's signature open space.

Mid-block pedestrian crossing with rapid flashing beacon in Boulder, CO.
Image from Nelson\Nygaard

Action SA7.7 Minimize pedestrian and vehicle conflicts at ingress and egress points to the bus and kiss-and-ride turnaround facility.

Pedestrians using the sidewalk on the station side of Ward Avenue will be required to cross the entrance and exit to the bus and kiss-and-ride turnaround. To minimize potential conflicts, a pedestrian crossing signal could be installed at this curb cut to allow for a protected pedestrian crossing phase.

Action SA7.8 Integrate a bike share station into the Kaka`ako station design, and provide space for expansion.

The station area should be designed to accommodate a 20 bike station with capacity to expand to 56 bikes by 2035. The approximate spatial requirements for the initial station and a 2035 build-out station are provided in the Figure 7-6 below.

Figure 7-6 Spatial Needs for Bike Share at Kaka`ako HART Station *(Opening Year and 2035)*

Year	Docks	Width	Station Depth	Access Depth	Total Depth
Opening	20	52' – 54'	6' – 8'	4	10' – 12'
2035	56	112'– 114'	6' – 8'	4	10' – 12'

Figure 7-7 Sample Station Dimension for 11 Dock Bike Share Station

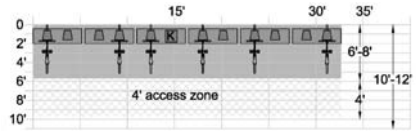


Image from Bike Sharing in the United States: State of the Practice and Guide to Implementation, FHWA (2012)

Figure 7-8 Sample Double-Sided Bike Share Station

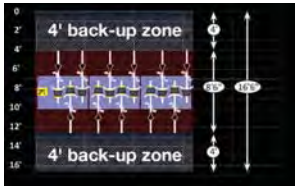


Image from Bike Sharing in the United States: State of the Practice and Guide to Implementation, FHWA (2012)

A design option is to employ two-sided stations, which would require less total width, but require a doubling of total station and access depth (approximately 20' to 24' required).

Action SA7.9 Provide high quality separated bike facilities connecting to the station on Ward Avenue and Halekauwila Street.

Ward Avenue and Halekauwila Street will provide direct bicycle access from each direction to the station. As the primary access routes, they present opportunities for separated bike facilities ranging from traditional and buffered bike lanes to cycle tracks. Given the levels of traffic on Ward Avenue, high quality treatments and vehicle separation will be required to attract a ridership base beyond the most avid and fearless cyclists. Although Halekauwila is a lower traffic street, bi-directional cycle track treatments will help attract higher bicycle ridership and provide a seamless connection between the Civic Center and Kaka`ako stations. The weather protection afforded by the elevated trackway should be supplemented with attractive lighting, signage and a reduction in curb cuts to help draw cyclists to the route.

A two-way cycle track on Hornby Street in downtown Vancouver, BC.
Image from Nelson\Nygaard

See the Bicycle section of Chapter 5 for more detail.

Action SA7.10 Provide high-quality shared bike facilities on Queen and Auahi Streets.

As key parallel facilities to the station and the proposed Halekauwila Street bi-directional cycle track, Queen and Auahi Streets are ideally suited for shared bikeway treatments including sharrows, directional signage and improved crossings. In addition to providing comfortable bike connections to Ward Avenues separated facilities, the features (e.g. traffic calming) associated with the shared bikeways will also help transform the two streets into more pedestrian friendly environments.

Action SA7.11 Increase supply of short- and long-term station bicycle parking at Kaka`ako Station.

Initial plans developed by HART suggest a need for 20 bicycle parking spaces for opening day service, increasing to 30 total in 2030. Based on the access demand estimates, an additional 10 spaces are recommended for opening day service. In 2030, that demand is expected to grow to 120 spaces with the implementation and build-out of planned TOD densities. Additionally, station design should anticipate the need for future growth in station area bike parking. A long-term bicycle storage facility that accommodates 30 bicycles is recommended. This facility should be located as close as possible to or, if possible, inside the fare gate. See call out for description of methods use to calculate bicycle parking.

Since this station is expected to be the destination end of more than 80% of home-based trips to and from the station, bike-share will be a critical strategy to complete last mile connections in the KCDD and adjacent neighborhoods.

Action SA8 Implement actions specific to the Civic Center Station.

Located on Halekauwila Street between South and Keawe Streets, Civic Center is the primary station for the district's many local, state and federal employees and visitors. Civic anchors and institutions include the Honolulu City & County Buildings, State Capitol District, Queen's Medical Center, Social Security Administration, and US Customs & Immigration. The station's site at the periphery of the district, however, will require passengers to walk or bike for the last leg of their trips. The recommended strategies and actions below focus on key priorities for enhancing multimodal access to these major destinations.

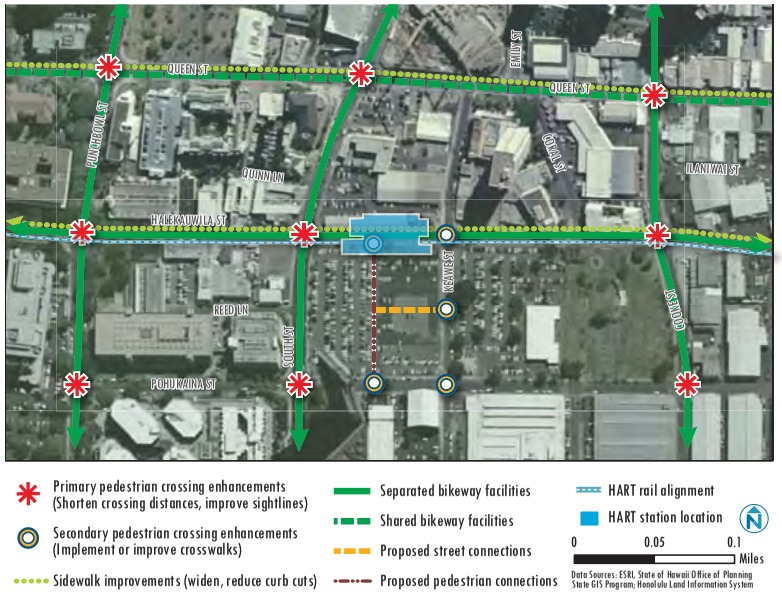
TRIMET APPROACH TO CALCULATING STATION BIKE PARKING

Portland is a national leader in bicycle accommodation and its public transit provider, TriMet, sees providing safe, secure access to transit for cyclists as a cornerstone of regional mobility. As part of its latest light rail project, the Portland to Milwaukee line, it developed a model for assessing bicycle access to stations based on each station's land use context, location, and availability of bicycle facilities. The model is used to determine how much bicycle parking to construct at each station. The model uses projected station ridership, transit frequency, urban context (center city, neighborhood, suburban, etc.) and bikeway network inventory data to determine optimal and minimum number of bicycle parking stalls. A similar approach was used to calculate bike parking requirements for the two stations in the KCDD.

A card-access bicycle parking facility at a suburban TriMet light rail station.
Image from Nelson\Nygaard

Long-term bike parking at a SkyTrain Station in Vancouver, BC.
Image from Nelson\Nygaard

Figure 7-9 Civic Center Station Access and Circulation



Action SA8.1 Establish Punchbowl Street as the primary pedestrian route between the station and local, state and federal campuses.

Punchbowl Street will be a major pedestrian conduit for transit riders traveling to the City & County of Honolulu buildings, the State Capitol District and federal facilities. It also provides a direct path to the busy bus transit stop at Punchbowl and King. To take advantage of its existing pedestrian amenities (zebra crossings, pedestrian signals, street trees), it should be promoted as the primary route through signage and wayfinding. Signage should provide clear direction to regular commuters as well as visitors and residents that access the government facilities on a less frequent basis.

Wide sidewalks accommodate high pedestrian volumes near a SkyTrain station in Metro Vancouver.
Image from Nelson\Nygaard

All three east-west oriented streets in the vicinity of the station – Queen, Halekauwila, and Pohukaina Streets – should all be treated as major pedestrian access ways to Punchbowl.

Action SA8.2 Enhance pedestrian experience along Halekauwila, Queen, and Pohukaina Streets.

While it will be critical to provide a quality pedestrian environment on Halekauwila in the vicinity of the station, pedestrians are not anticipated to travel long distances on this street. The introduction of an elevated guideway in this relatively narrow right-of-way will make the street relatively less appealing for walking. Features such as vibrant ground floor retail and street-front cafes, which contribute to a vital walking environment, are less likely to locate immediately adjacent to the guideway, making parallel streets such as Queen and Pohukaina more attractive for pedestrians. Important steps for improving the pedestrian environment on these streets will include:

- Integrate pedestrian scaled lighting into the elevated guideway structures or in the sidewalk furniture zone. Reduce the number of curb cuts along Halekauwila, Queen, and Pohukaina to ensure universal accessibility and limit the number of pedestrian-vehicle conflicts.
- Implement pedestrian crossings at the intersection of Halekauwila and Keawe.
- Construct mid-block crossings regularly along Halekauwila.
- Enhance pedestrian crossings on Queen and Pohukaina where they intersect Punchbowl, South, and Cooke. Improvements may include tightening corner radii, reducing crosswalk distances with curb extensions and pedestrian refuges, and addressing other sightline issues.

Action SA8.3 Improve pedestrian crossings in the Civic Center area by improving sightlines and shortening crossing distances.

Although pedestrian crossings in the Civic Center station area are generally marked, signalized or stop sign protected, many of them are angled, thereby impairing sightlines, and entailing longer crossing distances. This is especially true on the mauka side of the station along Queen and King Streets. Sightlines at these intersections could be improved by restriping crosswalks perpendicular to sidewalks. Curb extensions, or bulb-outs, should be implemented to reduce crossing distances.

Action SA8.4 Provide interim pedestrian walkways and preserve long-term connections through the surface parking block on the makai side of Halekauwila Street.

Interim pedestrian routes through the surface parking lot would provide direct access from the station to high-density development. As this lot is developed, a mauka-makai running center block pedestrian pathway should be considered (such a facility is included in the Kamehameha Schools Master Plan). Running parallel to the station, an extension of Reed Lane could be planned for a future connection to the Mother Waldron Playground.

Action SA8.5 Integrate a bike share station into the Civic Center Station design, and provide space for expansion.

Given the added distance from the station to many of the major destinations in the area, Civic Center is an ideal candidate for a bike sharing station. Likewise, the employment concentrations at those destinations provide the critical mass of potential users to warrant bike stations of their own.

The station area should be designed to accommodate a 20 bike station with capacity to expand to 56 bikes by 2035. The approximate spatial requirements for the initial station and a 2035 build-out station are provided in the table below:

Figure 7-10 Spatial Needs for Bike Share at Civic Center HART Station *(Opening Year and 2035)*

Year	Docks	Width	Station Depth	Access Depth	Total Depth
Opening	20	52' - 54'	6' - 8'	4	10' - 12'
2035	56	112'- 114'	6' - 8'	4	10' - 12'

Action SA8.6 Increase the supply of short- and long-term station bicycle parking at Civic Center Station.

Bike sharing programs help meet "last mile" connection needs at transit stations.
Image from Nelson\Nygaard

Initial estimates from the HART station access plans are to provide 20 bicycle parking spaces for opening day service, increasing to 110 total in 2030. Based on the access demand estimates, an additional 10 spaces are recommended for opening day service. In 2030, that demand is expected to grow to 130 spaces with the implementation and build-out of planned TOD densities. Additionally, station design should anticipate the need for future growth in station area bike parking. A long-term bicycle storage facility that accommodates 30 bicycles is recommended. This facility should be located as close as possible to or, if possible, inside the fare gate.

Since this station is expected to be the destination end of most than 80% of home-based trips to and from the station, bike-share will be a critical strategy to complete last mile connections in the KCDD and adjacent neighborhoods.

Action SA8.7 Promote South Street as a major bicycle route accessing the station and institutional uses.

The Civic Center station is located on the periphery of many large government employers. While in the future it will be the center of an active mixed-use area, in the short- to mid-term attention must be paid to the last mile connections for potential transit riders. For instance, the station is over

½-mile to the State Capitol and the Queen's Medical Center. Although still within reasonable walking distances, these destinations are ideally suited for short urban bicycle trips. To this end, South Street's existing right-of-way width and capacity affords opportunities for innovative separated bicycle facilities. Its one-way operations, however, make traditional bike lanes on opposite sides of the street problematic. Rather than having to provide facilities on parallel streets, cities have addressed this condition by implementing contraflow bike lanes on the same side of the street. A pilot project on 15th Street in Washington, DC yielded a 40% increase in bicycle traffic and a 7 mph reduction in vehicle speeds within one year.

Two-way cycle track on 15th Street in Washington, DC.
Image from Green Lane Project

An alternative to two-way cycle track on South Street is to couple it with Punchbowl Street as parallel one-way facilities going in their respective directions.

Action SA8.8 Provide separated bicycle facilities along Cooke Street.

Separated bike lanes on Cooke Street would provide direct access to the University of Hawai`i School of Medicine and the Kaka`ako Waterfront Park.

Strategy SA9 Implement actions specific to Downtown Station (related to redevelopment of Aloha Tower portion of the District)

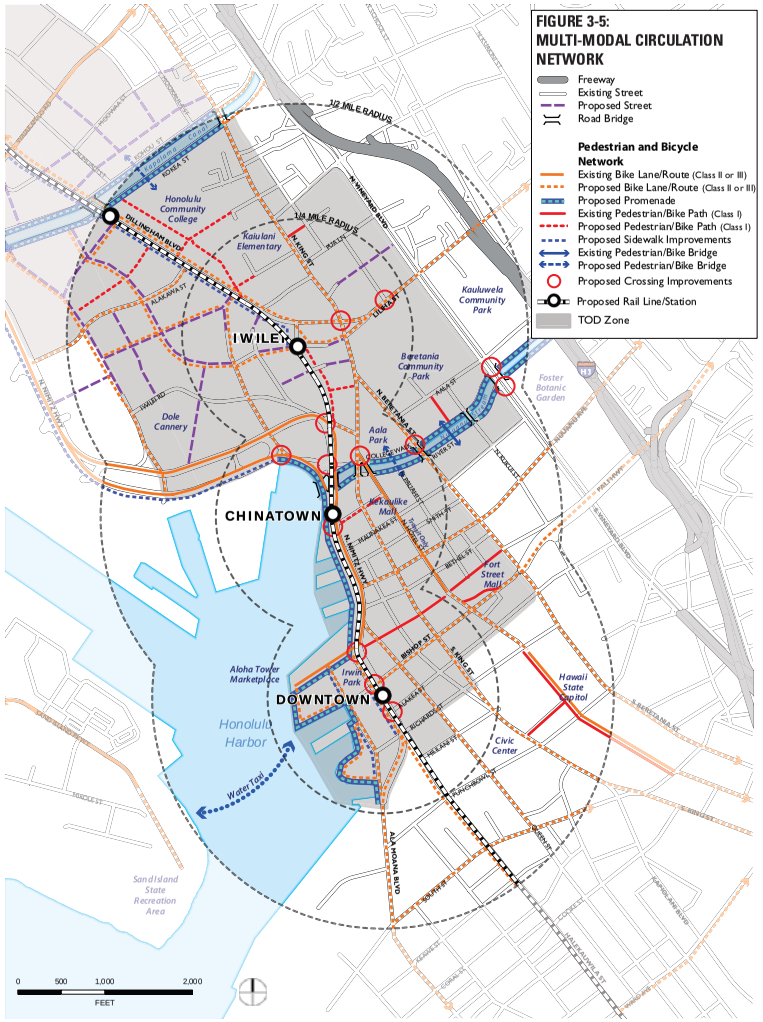
The Downtown HART station sits at the makai edge of the Aloha Tower Marketplace. This area of the KCDD also includes the HECO Powerplant site which is slated for redevelopment. The City/County Kilihi-Downtown Framework Plan calls for the area surrounding this station (including Aloha Tower site) to be developed as intensive mixed use development. The Framework Plan calls for maximum FAR of greater than 7 for this site and surrounding properties .

The City and County has completed a Downtown Neighborhood Transit Oriented Development Plan that provides detail on land use, station integration, and design for the Downtown Station. This plan documents specific transportation existing conditions and proposed access and mobility projects.

Action SA9.1 Implement Connectivity Improvements from the Downtown Framework Plan

The Kilihi-Downtown Framework Plan calls for improved trail access and sidewalk improvements that would improve Ewa Diamond Head connectivity between the Aloha Tower Area and other parts of the KCDD. HCDA should work with the City/County DTS to prioritize and complete these improvements which are illustrated in Figure 7-11 excerpted from the Kalihi-Downtown TOD Framework Plan.

Figure 7-11 Connectivity Improvements for Downtown HART Station Area



Action SA9.2 Create a seamless and inviting pedestrian connection between Downtown and the Aloha Tower area

Introduction of the downtown station represents an opportunity for transformational change at what currently is the greatest pedestrian barrier between Downtown and the Waterfront/Aloha Tower area- the Nimitz Highway. HCDA should work with HART and the City/County to enure the design of this station includes significant placemaking investments and prioritizes mauka – makai pedestrian movements.

The station should have pedestrian entrances on both sides of Nimitz Highway to ensure passengers can ascend to the platform without crossing the Highway. Pedestrian cross-block concept would create a high quality public space and pedestrian crossing opportunity at Nimitz. This could be designed as a pedestrian-scramble intersection allowing all users to cross at the same time anywhere on the block .

The Haleakuwila cycle track concept presented in Chapter 5 provides an opportunity for excellent Diamond Head side bike access to this area. Similar attention should be given to connections from the Ewa direction.

Pedestrian Circulation Across Nimitz:
- Irwin Park extension across Nimitz
- Entire block that will function as a crosswalk
- Provides an area of Nimitz that is at the pedestrian scale
- Allows motor vehicles to only need to stop once for pedestrian crossing

Pedestrian Crossblock

Pedestrian improvements between the Downtown Station and Aloha Tower Special District.
Image from HCDA

Station Integration Opportunities

This section identifies strategies and opportunities that require coordination and engagement between HCDA and HART. Integration opportunities are established for the three HART stations: Kaka`ako Station, Civic Center Station, and Downtown Station.

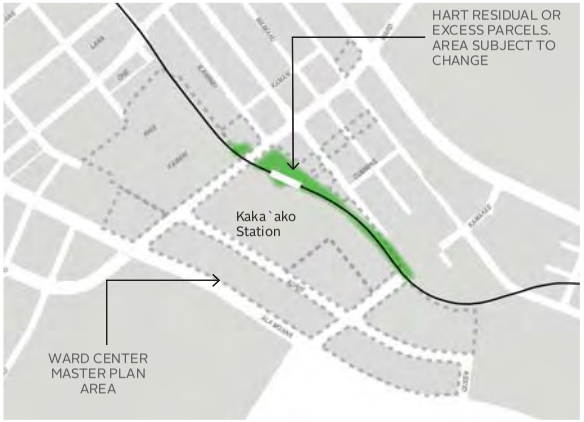
Opportunities for Kaka'ako Station Integration

Located on the mauka edge of the Ward Center master planned district, there is great potential for collaborative TOD development at Kaka`ako Station. . The current Ward Center Master Plan already envisions this area as a mixed-use, high-rise neighborhood. The TOD Overlay will provide opportunities to better address street level connectivity with public open space connections to Kaka`ako Station (see also Figure 7-5), district parking options as well as provisions for more intensive uses.

In addition, the immediate station site and alignment include several adjacent residual or excess parcels (shown below) associated with HART construction. These areas may eventually be good candidates to incorporate future retail, public or civic uses.. A single or double story structure adjacent to the station would help to activate the area while allowing room for pedestrian movement and generous gathering places.

It is recommended that if an Iconic tower (a building over 550' in height) is to be located in Auahi Neighborhood at Kaka`ako Station, it should be set back from the station site to ensure that adequate space for pedestrian and vehicular circulation and future local transit service connections. HCDA, HART and the land owners are currently coordinating arrangements necessary for integrated redevelopment. Precedent best practices at similar station locations are discussed in the sidebar on the following page.

Figure 7-12 Kaka`ako Station at Ward Center



BEST PRACTICES IN RETAIL INTEGRATION

Broadway /Commercial Station SkyTrain The Hub - A low scaled retail building is incorporated adjacent to an Elevated rail transit exchange. This provides eyes on the street, and a retail presence to keep people safe, provide a sense of place and wayfinding. This single story structures adjacent to the station to activates the area, and allows for room for pedestrian movement and gathering places.

Image from VIA Architecture

Image from VIA Architecture

Westlake Center in Seattle, WA is a good example of elevated retail associated with a public plaza. Westlake center is also a transit hub with connections to light rail, and regional and local bus service below. Major developments are set back from the rail station from one half to one block.

Image from VIA Architecture

Opportunities for Civic Center Station Integration

There are a variety of opportunities for TOD redevelopment within close proximity to Civic Center station, including sites directly mauka and makai of the station. The HART Station Area Development Potential Report (2011) asserts that Civic Center Station has "perhaps the greatest (redevelopment) potential of any station along the project alignment excluding the West O`ahu stations." Underutilized parcels here surround the station, existing uses include surface parking lots, low-rise warehouses and garages. The 690 Pohukaina catalyst project is located at Keawe and Halekauwila, one block from Civic Center Station, while the parcel directly makai of Civic Center is a part of the Kamehameha Schools master plan and is currently proposed for a high-rise housing project. The following diagram provides an overview vision of TOD potential for the Civic Center station location.

Figure 7-13 Civic Center Station Vision and Opportunities

1 TOD Opportunity Sites mixed-use and residential uses

2 Activate station with uses, maximize glazing and open shopfronts

3 Place bus stops convenient to station, consider integrating shelters into development sites

4 Coordinate with TOD developments for street improvements, crosswalks, lighting and public art

5 Encourage single story retail to activate parking, for example - produce or market stalls

6 Establish bike lanes and local access connections

7 Option for vertical retailing and mezzanine connection to station

8 Step-back development for generous sidewalk areas and public realm enhancements

9 New alley and connections to reduce pedestrian conflicts

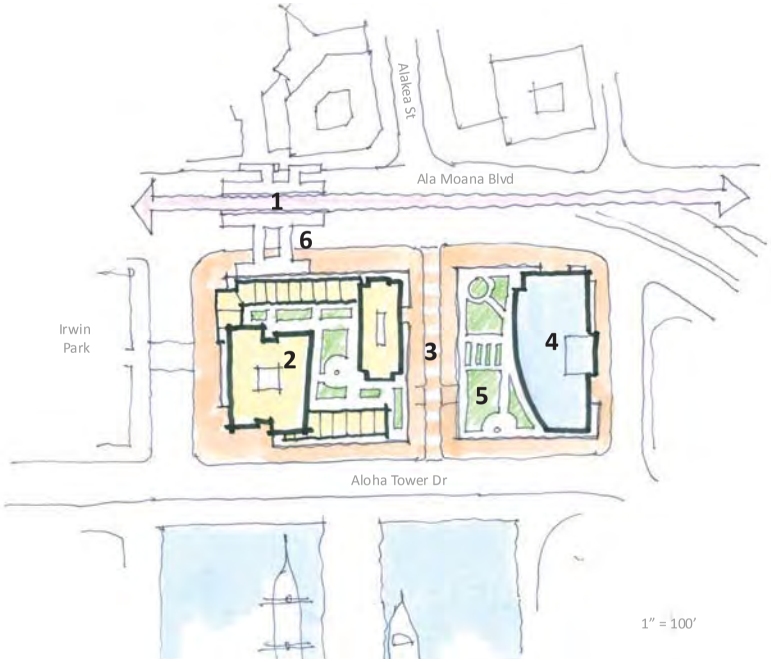
10 Pedestrian improvements, crosswalks and accessible ramps Station-related public realm improvements, kiosks or bike-related retail

11 Joint development 690 Pohukaina and affordable housing project

Opportunities for Aloha Tower Special District, HECO Site, and Downtown Station Integration

Downtown Station is within close proximity to the Aloha Tower marketplace, the downtown commercial core, Irwin Park and Honolulu Harbor. It is the primary station serving Honolulu's central business district. The HECO substation parcel adjacent to Downtown Station is particularly well positioned for TOD redevelopment for a range of uses, as it enjoys waterfront views and proximity to downtown. Under the TOD Overlay plan this site would be able to develop using an increase in capacity with more flexibility in off-street parking requirements. This vision is coordinated with the City and County of Honolulu Downtown TOD Plan (2012) that envisions this area as a mixed-use, high intensity district appropriate for high rise buildings. The Plan also recognizes an opportunity for revitalizing the Aloha Tower HECO substation complex into a citywide destination and community-gathering place.

Figure 7-14 Downtown Station at Aloha Tower Special District Vision and Opportunities



1 HART Downtown Station at Aloha Tower Special District

2 Multifamily residential opportunity site

3 Shared street

4 Commercial / office opportunity site

5 Integrated public space

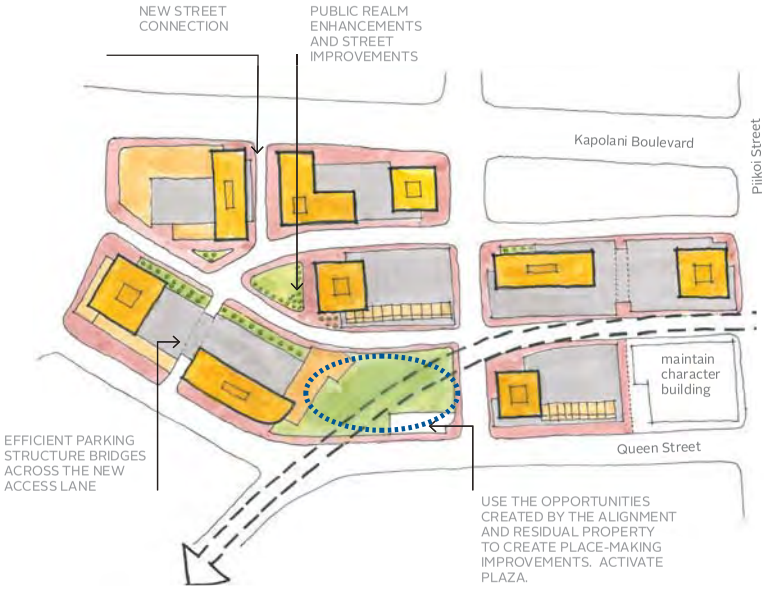
6 High-quality pedestrian plaza and integrated roadway crossing

Opportunities for the Elevated Alignment

Integrating the overhead alignment into a working neighborhood requires special attention to shadow creation, and spaces around columns. Existing uses on Halekauwila St. include light industrial services, shops and a variety of walk-in trade establishments. Unintended impacts of the elevated rail include underutilized land or vacant storefronts adjacent to the guideway. HART is currently collaborating with HCDA to ensure that the design of the elevated alignment will address this areas incremental urbanization. In particular HCDA and HART will coordinate to ensure that the impact on the pedestrian environment is reduced.

In Bangkok, under the transit alignment is a busy, urban place
Image from Google Earth

Figure 7-15 Alignment Design Opportunities



Activating the Alignment

HCDA should prepare for transition, by working with property owners to activate below the guideway where feasible, as well as partnering with HART and the private sector for the provision of active public spaces such as paths, exercise courses, community gardens, lighting and art, shops or storefronts. HCDA and HART will coordinate to

- Reduce impact and number of supportive dual columns that crowd the urban context.
- Locate ancillary buildings such as electrical transformers, maintenance facilities to provide both operational efficiency and better respond to urban context.
- Welcome users by activating ground levels with retail or other commuter uses, such as services or daycare and bike share stations.

Image from VIA Architecture

View 1
Design Based on a possible new road configuration and column consideration into a center median. For illustrative purposes only.

1 center column supports located on 18'-20' wide median

Image from VIA Architecture

View 2
Design based on HART Preliminary Engineering Drawings. For illustrative purposes only.

2 dual column support located on sidewalks

Image from VIA Architecture

Urban Design and TOD Impacts of Elevated Rail

Parcels adjacent to, or within the sphere of influence of the alignment will be impacted in a variety of ways over the course of the project, ranging from land acquisition (and the creation of some residual land parcels adjacent to the Kaka`ako Station site), to construction nuisance, and noise impacts from the overheard train. At the same time these areas will also see significant private sector benefits typical to transit rich areas such as:

- Increased land values, and real estate performance (rents and lease rates)
- Increased retail sales
- Increased access to labor pools
- Increased affordability due to increased access and reduced parking costs by providing transit alternatives
- Renewed vitality as a destination

HCDA and its public sector partners will work to ensure that the benefit of the rail can be broadly shared in the form of improvements to local infrastructures and specific transit-oriented development projects that will locate more investment within proximity of the station. The HART Station Area Development Potential Report (August 2011) conducted an analysis identifying underutilized parcels and opportunities for redevelopment within each station's quarter-mile. This report documented that redevelopment potential is greatest at the three West O`ahu stations followed closely by the Kaka`ako District's Civic Center Station. In order to best meet this potential for redevelopment, the following presents a set of recommended strategies to be conducted during the phases of HART design and construction, with a focus on integrated decision-making.

Strategy SA10 Collaborate with HART in order to integrate station design with TOD sites and catalyze redevelopment.

In order to best meet this potential for redevelopment, HCDA must implement or collaborate to achieve the following actions during the phases of HART design and construction, with a focus on integrated decision-making.

HCDA ACTIVITIES

Current phase (2013)

- **Action SA10.1** Work with agency partners to plan transit stations and associated infrastructure that are attractive public destinations, are integrated with the public realm and promote ridership.
- **Action SA10.2** Develop strategies for private-sector engagement with partnerships, demonstration and/or catalyst projects to spur desired uses (see Chapter 3, page 3-19).
- **Action SA10.3** Provide a vision, design and principles for the station design, and support redevelopment with high trip-generating land uses (see Chapter 3, page 3-6).

Construction phase (2016-2018)

- **Action SA10.4** Collaborate with jurisdictional and private sector partners to provide market-place comparable, such as the 690 Pohukaina joint-development project. (Chapter 3, pages 3-21).
- **Action SA10.5** Meet with local stakeholders to reinforce the benefits and opportunities of TOD, include financiers, lenders, property owners and developers.
- **Action SA10.6** Partner to provide a vision for residual properties impacted by the rail, including clarifying liability. Consider a method, if necessary to land-bank residual properties resulting from construction areas for future high intensity development so they do not result in long-term underutilization.

HART Complete (2019)

- **Action SA10.7** Continue to work towards the evolution of Kaka`ako District, including large and small scale redevelopment, master plans and priority complete streets and access upgrades as defined in this chapter.

Strategy SA11 Establish partnerships with key stakeholders to ensure successful station integration and TOD design.

In urban environments, success will be achieved if transit becomes just one part of the overall public experience of Kaka`ako as a destination. The implementation of this vision will require a partnership among agencies over the course of the project to ensure that land use, transportation and access policies are coordinated for optimal outcomes. Most importantly, HCDA will encourage creativity with neighborhood transformation, by planning for, and encouraging both large-scale redevelopment and incremental adaptive-re use to advance TOD objectives. The following summarizes roles for the public sector (HCDA and City/County), private sector and HART in creating both transit-oriented development and influencing the creation of place at a station site.

Public Partner (HCDA and City/County)	Private Partner	Transit Agency
Development Regulations /Permits	Development Proposals	Alignment / Station Design
Land Acquisition and Consolidation	Land Assembly	Land Acquisition for System
Environmental Reviews	Architecture and Programming	Planning Partner
Community Facilitator	Entitlements	Construction Facilitator
Land Owner Incentives	Construction	Urban Design Guidelines for Stations and Alignment
Priority Infrastructure Improvements and Public Facilities	Occupancy/ Maintenance/ Selling	

DRAFT

8 PARKING & TRANSPORTATION DEMAND MANAGEMENT

DRAFT

8 PARKING & TRANSPORTATION DEMAND MANAGEMENT

Role of Parking

The pivotal role of parking in all aspects of the life and economy of an urban district is often overlooked. Because provision of parking is very costly, the amount of parking required is often a key determinant of the quality and quantity of new development. The price and availability of parking influences how people choose to travel and whether they will travel to destinations within the district. The amount of space dedicated to parking is a determining factor is the form development takes and to the experience of a pedestrian within the district. Adopting a sensible and well-tailored approach to managing parking may be the single most important thing that HCDA can do to foster a pedestrian-friendly, transit-oriented Kaka`ako community. This section details specific steps that should be taken to manage parking in the KCDD.

Existing Regulations

Off-Street Parking

The Mauka and Makai Plans include parking standards for each land use type, including the quantity of off-street parking and loading spaces that must be provided. A summary of these minimum parking requirements is provided in Figure 8-1.

Figure 8-1 Existing Off-Street Parking Regulations

Land Use	Mauka	Makai
Residential		
Detached dwellings, live-work, and duplexes	2/unit + 1/ 1,000 sq ft of floor area over 2,500 sq ft	Not Applicable
Multi-family dwelling (<600 sq ft)	0.9/ unit	0.9/ unit
Multi-family (600-800 sq ft)	1.25/ unit	1.13/unit
Multi-family dwelling (>800 sq ft)	1.25/ unit	1.35/unit
Group homes, care, convalescent and nursing home	0.9/ 4 patient beds, dwelling units, or lodging units	0.9/ 4 patient beds, dwelling units, or lodging units
Commercial		
Commercial, clinics, administrative and all other uses	1/ 450 sq ft of floor area	1/ 400 sq ft of floor area
Restaurants and bars, and dance-nightclubs	0.9/ 300 sq ft of eating or drinking area + 0.9/ 25 sq ft of dance area + 1/ 450 sq ft of kitchen or accessory area	1/ 300 sq ft of eating or drinking area + 0.9/ 25 sq ft of dance area + 1/ 400 sq ft of kitchen or accessory area
Industrial, media production, printing and publishing and warehousing	One per nine hundred square feet of floor area	Not Applicable
Education and Assembly		
Group assembly/Auditorium	0.9 per three hundred square feet of assembly area or 0.9 per ten fixed seats, whichever is greater	0.9 per three hundred square feet

Land Use	Mauka	Makai
Religious facilities and theaters	0.9 / 5 fixed seats OR 50 sq ft of general assembly area (whichever is greater)	0.9 / 5 fixed seats OR 50 sq ft of general assembly area (whichever is greater)
Day-care facilities	0.9/ 10 enrolled capacity	1/ 10 enrolled capacity
Educational (elementary and intermediate level)	0.9/ 20 students of design capacity + 1 / 450 sq ft of office floor area	Not Applicable
Educational (high school, vocational, technical university, etc.	0.9/ 10 students of design capacity + one per 450 sq ft of office floor area	1/ 10 students of design capacity + one per 400 sq ft of office floor area
Waterfront Industrial	Not Applicable	1/1,000 sq ft of floor are or 1/ 2 employees, whichever is greater.

Source: KCDD Mauka and Makai Area Plans

Minimum parking requirements like these have emerged as one of the biggest obstacles to many cities' efforts to encourage new residential and commercial development in downtown areas, especially in cities like Honolulu where nearly all parking must be provided in multilevel above ground facilities. With the cost of providing multilevel parking spaces exceeding $50,000 per space, it no longer makes sense to provide more parking than is needed, since the value put into unused parking could be used for a higher quality of development or for additional amenities. Furthermore, the availability of plentiful and unused parking will ultimately undermine efforts to create a walkable transit-oriented community. More specifically, minimum parking requirements have been shown to:

- Create an "oversupply" of parking in most communities in all but the highest periods of parking demand
- Devalue the true "costs" of parking to drivers, thereby creating an incentive to drive, which results in more local congestion and vehicle emissions
- Require tremendous amounts of land, thereby degrading the physical environment and impacting a community's urban form, design, and aesthetics
- Limit the ability to do urban "infill" projects or adaptively reuse historic structures
- Make development projects more expensive and reduce overall profitability

It is very difficult to create a walkable, bikeable environment when more land is dedicated to parking than to buildings. The oversupply of parking resulting from minimum parking requirements can be particularly damaging to uses such as restaurants, which help create a sense of streetlife.

High levels of temporary residency and out-of-state ownership in Honolulu further exacerbate the disparity between supply required by minimum parking standards and actual levels of use at any given time. While KCDD developers report that the market for high-end condos demand some level of guaranteed parking sold with the unit, lower- to moderate-income units may not, particularly if other choices for mobility are available.

On-Street Parking

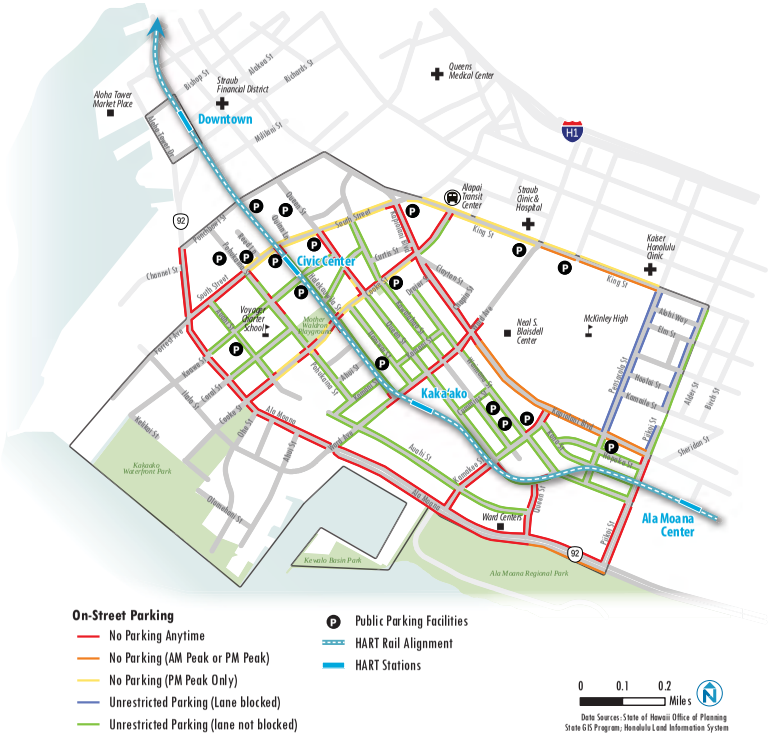
Figure 8-2 illustrates on-street parking in Kaka`ako. Curb parking is regulated as follows:

- On the major regional Boulevard, curb parking is not permitted at any time or at least not during peak travel hours.
- On portions of Cooke, South, and S. King Streets, Parking is not permitted during the PM peak period, while portions of Kapiolani and Ala Moana Boulevards restrict parking during both the AM and PM peak periods.

- On-street parking is free on many blocks in the district: relatively few streets east of Cooke have parking meters. To the west of Cooke, many streets are metered including Pohukaina, Halekauwila, Auahi, Kawaiahao, Cooke, and Queen Streets in the Civic Center neighborhood. Other streets in that same district remain unmetered.
- Where curb parking is permitted, there is a mix of completely unrestricted parking, and parking with 1- or 2-hour time limits.

On weekdays, unrestricted parking typically fills to capacity with long-term parkers early in the day, while time-restricted parking goes largely unused.

Figure 8-2 On-Street Parking Regulations



Source: Kaka`ako Mauka Specific Plan SEIS

Given high levels of employment and relatively few retail or residential uses in Central Kaka`ako, street or alley parking that is not time-limited fills quickly in the morning, while time-limited on street parking remains highly underutilized through much of the day.

Parking with no time limits is full in the early morning.
Image from Nelson\Nygaard

Poorly managed on-street parking can have other negative consequences for the transportation system and the quality of the public realm: When demand for curb parking exceeds supply, drivers end up circling the block searching for an available parking space. This behavior wastes time for drivers and generates unnecessary traffic and emissions: *some studies have shown that as much as 30% of traffic in the busiest downtown areas is the result of circling for parking.* Drivers searching for parking also tend to be more distracted and less attentive to the road, which can increase the collision risk for pedestrians, cyclists, and other drivers.

Time-restricted parking, particularly supply further from the Downtown/Civic Center area, is underutilized.
Image from Nelson\Nygaard

A Market-Based Approach to Parking

Parking is not an end in itself, but rather a means to achieve and support broader community goals and priorities. Rather than focusing on providing an arbitrarily chosen quantity of parking, successful transit-oriented communities actively manage parking to ensure on-street or easily accessible public parking availability for visitors, while right-sizing supply for new development; and allowing the market to determine parking's appropriate price and its value relative to other potential uses for land. Eliminating arbitrary parking minimums does not eliminate new parking supply; rather it allows development to build the precise amount of parking they need to keep their development viable.

Key principles for this approach are as follows:

- **One size does not fit all.** Parking regulations and management strategies should be tailored to the district, and careful measurement of real-world parking supply and demand.
- **Ensure that some parking is always available.** Parking facilities should be managed to achieve 85-90% occupancy, which represents the optimal balance between ease of finding a space and the efficient use of parking resources. This is particularly important for the most visible spaces on the street, and close to garage entrances. If occupancy rises above 90%, it should increase in price, a reduced time limit, or another measure to increase availability. A well managed parking system will almost always have one parking space available on each block face, so that no one is forced to "circle" to find parking near their destination.
- **Share information about parking availability.** Economic success depends not just on the availability of parking, but on the public's perception of availability. Wayfinding should be used to ensure that drivers know where to look for available parking.

- **Share Parking.** Whenever possible, parking should be managed as a shared resource, rather than reserved for customers of a particular business. A city's parking supply is also a public good that needs to be actively managed so that it can meet parking demand during different seasons, different days of the week, or even at different times throughout the day.
- **Manage the entire parking supply as part of a coherent system.** To the extent possible, different types of parking—on- and off-street, public and private—should be managed according to the same set of principles. Pricing, time limits, and payment mechanisms should be standardized as far as possible.
- **Use parking as a tool to manage roadway congestion.** In dense urban districts, traffic congestion can become a serious problem. Cities can mitigate this problem by matching the total parking supply to the capacity of the roadway system.
- **Maximize the contributions of parking to good urban design.** With good design, parking facilities can contribute to, rather than detract from, the quality of the public realm.

Parking Policies and Incentives

This section details a set of policies, rule changes, and implementation strategies designed to create a market-based approach to parking management in the Kaka`ako district. Implemented fully, they will remove unnecessary incentives for driving, reduce traffic congestion, and improve the sense of place in the district. The section that follows outlines a set of Transportation Demand Management (TDM) strategies that will reinforce the effectiveness of this approach to parking.

Manage On-Street Parking

- The primary management goal for on-street parking supply in KCDD is to optimize access for businesses that rely on short-term visitors. This can be done by making it as easy as possible to find a parking space near where customers want to go. By setting specific availability targets and adjusting prices, demand can be effectively managed so that when a motorist chooses to park, they can do so without circling in search of a space, generating unnecessary traffic and emissions.
- In an emerging rail station area, on-street supply must be carefully managed to ensure that all-day or commuter park-and-ride uses are not allowed and that local parking needs are not overwhelmed by demand for access to the rail system.
- A set of strategies for management on-street parking is presented below.

Strategy PT1 Price on-street parking to ensure availability

One of the best ways to balance parking supply and demand is to treat parking like any other scarce commodity, and require motorists to directly pay for use of a space. By setting a price for parking, a city can establish the "market value" for each parking space and adjust those prices depending on the level of demand. Just as hotel room rates increase or decrease based on availability, demand-based pricing for parking seeks to increase prices when and where demand is highest and reduce prices when and where demand is low.

An ideal occupancy rate for on-street, curb spaces is approximately 85% at even the busiest hour, a rate which leaves about one out of every seven spaces available. These rates provide enough vacancies that visitors can easily find a spot near their destination when they first arrive. For a given block or off-street facility, the "right price" is the price that will achieve this goal. This means that pricing should not be uniform: the most desirable spaces need higher prices, while less convenient lots are cheap or may even be free. Prices could also vary by season, day of week, or time of day. Demand-based pricing can result in the following benefits:

- Consistent availability and ease in finding a parking space
- Longer time limits, thereby eliminating the need to move a vehicle to avoid time restrictions
- Convenient payment methods (credit cards, pay-by-phone) that eliminate the need to "plug the meter" and make it easier to avoid parking tickets
- Reduced search time for parking, resulting in less local congestion and vehicle emissions
- Reduced illegal parking and improved safety and street operations
- A more equitable and efficient way to account for the real costs to a city for providing parking

New advances in parking meter technology, such as wireless "smart" meters, make demand-based pricing a feasible option and can dramatically increase motorist convenience.

Action PT1.1 Designate Zones and Monitor Parking Occupancies

HCDA will conduct an initial study of on-street parking supply, occupancy, and turnover. To aid in the understanding of these conditions, the district will be divided into functional parking zones as illustrated in Figure 8-3. Threshold parking occupancies should be established for each zone.

Once a baseline understanding of these conditions is established, HCDA will continue to monitor parking patterns on an ongoing basis, particularly as new development occurs and new residents and business move into the district. This information will be used to inform placement of parking meters, prices, and other regulations.

Figure 8-3 Potential On-Street Marking Evaluation Districts

SOUTH LAKE UNION DEMAND BASED PRICING IN A TRANSITIONAL DISTRICT

In 2005, Seattle's South Lake Union District was dominated by light-industrial land uses. However, the District was on the verge of a major transformation. A single developer owned large areas of the district and had an aggressive master plan to transform South Lake Union into a dense, mixed-use urban neighborhood. At that time, parking demands in the district were very similar to Kaka`ako today. All non-regulated parking was full at 7 AM, used by local workers and those parking and walking to downtown. Time limited parking was highly underutilized. Nelson\Nygaard developed an on-street parking study that balanced current demand with the needs of a growing district.

Curb parking in Seattle's South Lake Union District
Image from Nelson\Nygaard

The plan recommended metering the entire district with no time restrictions on parking, except in areas where there were existing retail businesses. Prices were set based on demand, so all day worker parking was allowable and comparable to market rates in off street facilities. City staff was allowed to adjust prices quarterly to ensure 10-15% of parking was available at all times. Time restrictions have been added as the district redeveloped and ground floor retail uses were established. The flexibility of this approach has allowed the city to collect valuable parking revenue and manage parking incrementally as various areas of the district developed.

Action PT1.2 Authorize Staff to Implement Parking Meters and Adjust Prices

HCDA will work with the County and City of Honolulu to establish an ordinance that authorizes managing the on-street parking supply to ensure availability. The ordinance will:

- Specify a target on-street parking occupancy of 85% on each block face.
- Implement paid parking using parking meters or pay stations where necessary to achieve the target occupancy rates.
- Specify the frequency for adjusting price schedules. Based on data collected through ongoing monitoring, staff will adjust meter prices as needed to achieve the target occupancies.

There are a variety of meter types and technologies, including single-space and multi-space models. At a minimum, the meters should incorporate credit card and pay-by-phone technology.

Action PT1.3 Implement a pilot test of metered pricing

Most of the district's on-street parking is either unregulated and fully occupied throughout the day, or subject to time limits, and very lightly used. This pattern of use suggests that there is significant demand for longer-term parking. Conversion of some time-limited space to metered parking may help to serve this demand while raising revenue. HCDA, in conjunction with the City and County of Honolulu, will implement a pilot program, converting some time-limited on-street parking to metered parking without time limits. Low prices should be set initially to gauge the strength of demand. The test could begin by adding meters to all on-street parking that is not yet metered in the area west of Cooke Street (labeled as Area 1 in Figure 8-3). The rest of the district could be monitored and considered for future implementation. If the pilot program successfully attracts parkers and raises revenue without negative impacts, it should be widened to include other areas.

Action PT1.4 Consider establishing Parking Benefit Districts (PBD)

While effectively managed on-street parking improves retail sales and economic vitality of business districts, business owners are often initially concerned about the effect that priced parking will have

on their competitiveness with malls and other locations that offer free parking. One way for parking reforms to win the support of business owners is to establish "parking benefit districts," a system that returns some or all parking meter proceeds to the immediate area in the form of improvements to the business district itself. Improvements may include street sweeping, pedestrian improvements, lighting, landscaping, or other improvements as selected by businesses located in the district. Besides establishing up-front buy in, Parking Benefit Districts give business owners a long-term stake in the success of parking management and reduce opposition to future price increases.

RECOMMENDED RULE CHANGES FOR KAKA`AKO

The following regulatory changes would govern regulation of on-street parking in the Mauka and Makai areas of Kaka`ako.

- **Regulation PT1.1:** Establish on-street parking occupancy target of 85% per block face.
- **Regulation PT1.2:** Implement parking meters where necessary to meet occupancy target (Specifies blocks where parking meters are permitted).
- **Regulation PT1.3:** Enable meters to adjust prices based on demand (Specifies maximum amount that prices can be moved within a specified time period).

SMART METERS IN HONOLULU

In June 2012, the City and County of Honolulu started a pilot test of new smart parking meter technology. Designed to be convenient for motorists, the meters are solar powered, and allow payment by phone or credit card. The test also includes vehicle detection sensors, which will be used to collected information about parking occupancy. Phase 1 of the pilot test included Honolulu Civic Center Garage, S. King St. and Punchbowl St. near the state capitol building, and Honolulu Police Department. In phase 2, the test was expanded to Chinatown and the Financial Districts. This or similar meter technology could be deployed elsewhere in Kaka'ako.

Locations for Honolulu's SmartMeter Pilot
Image from City of Honolulu

Single space Smart Meters used in Honolulu's pilot test
Image from City of Honolulu

Replace Off-Street Minimum Parking Requirements with a Market-Based Approach

Today, regulations specify the amount of dedicated off-street parking that must be provided by any land use in the Mauka or Makai districts. However, once on-street parking is effectively managed, off-street minimum parking requirements will no longer be needed to ensure availability. Instead, excessive off-street parking would only worsen traffic, and discourage developers, employers, residents and other property owners from implementing strategies that reduce traffic and parking demand. A new set of rules for off-street parking provision is presented below.

Strategy PT2 Remove minimum parking requirements

Under this strategy, minimum parking requirements would be removed for all development within Kaka`ako. Off-street parking could still be built, but developers would determine the quantity of parking based on their own analysis of what is economically feasible for their project and what they believe the true parking demand is to make their project viable.

This change would create a "free market" for parking that is more realistically determined by actual parking demand, as opposed to arbitrary parking standards. It would reduce development costs and provide additional flexibility to developers, especially on smaller lots or with historic structures. It would also help to ensure that existing parking supply is efficiently utilized before additional parking supply is built. Numerous cities around the world, including many in North America have eliminated minimum parking requirements in major districts, including Seattle, San Francisco, Portland, OR, and Vancouver, BC.

The following requirements would still apply to all parking built in the district:

- Any parking built would still be subject to the parking design standards outlined in the Mauka Area Rules.
- As described above, any amount of parking supplied above the existing minimum parking requirements would be subject to shared parking. In other words, HCDA could retain the current minimum parking requirements (as per the Mauka Area Rules) as maximum level of parking which can be built as private, single-use parking. Any parking above that level would be required to be managed as shared supply.
- As described above, the cost of all parking would be "unbundled" (paid for separately) from the cost of housing or commercial leases.

RECOMMENDED RULE CHANGES FOR KAKA`AKO

The following regulatory changes would remove minimum parking requirements throughout the Mauka and Makai areas of Kaka`ako.

- **Regulation PT2.1:** Minimum parking requirements in the Mauka rules (Section §15-217-63 (e)) are repealed.
- **Regulation PT2.2:** Minimum parking requirements in the Makai rules (Section §15-23-68) are repealed.

Strategy PT3 Include building area devoted to parking as part of the calculated Floor Area Ratio (FAR) for a proposed development project.

The land use guidelines outlined in Chapter 3 of this plan include permitted Floor Area Ratio for each development parcel. Space devoted to parking does not count toward the permitted FAR in the current Mauka/Makai rules. Under this strategy, parking would be counted towards FAR calculation. Developers would therefore have a choice between dedicating floor area to parking or to other active uses that enhance the development and generate revenue for the developer. Utilizing the market based approach, a developer would be free to determine the most profitable use of the available space. More detail on this recommendation is provided in the Urban Design section of this plan.

RECOMMENDED RULE CHANGES FOR KAKA`AKO

The following regulatory changes would remove minimum parking requirements throughout the Mauka and Makai areas of Kaka`ako.

- **Regulation PT3.1:** FAR allocations are inclusive of parking.

Shared Use Parking Regulations

Because many different land uses (a bank and a bar or restaurant, for example) have different periods of parking demand, they can easily share a common parking facility, thereby limiting the total number of spaces required to serve the demand for parking at any one time. Shared parking policies do not treat the parking supply as individual units specific to particular businesses or uses, but rather emphasize the efficient use of the parking supply by including as many spaces as possible in a common pool of shared, publicly available spaces.

Strategy PT4 Establish a "park once" district in Kaka`ako

The typical suburban pattern of isolated, single use buildings, each surrounded by parking lots, requires two vehicular movements and a parking space to be dedicated for each visit to a shop, office, or civic institution. By contrast, shared parking policies facilitate "park once" districts, in which motorists can park just once and complete multiple daily tasks on foot before returning to their vehicle. Overall, the benefits of fully implementing a "park once" strategy include:

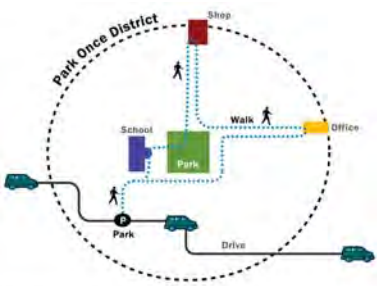


Image from Nelson\Nygaard
Based on illustration by Walter Kulash

- Reduced vehicle trips and required parking spaces because spaces can be efficiently shared between uses with differing peak hours, peak days, and peak seasons of parking demand.
- More welcoming environment for customers and visitors because they do not have to worry about getting towed for parking at one business while visiting another
- Allows for fewer, but more strategically placed lots and structures, resulting in better urban design and greater redevelopment opportunities
- By transforming drivers into pedestrians, who walk instead of drive to different destinations, shared parking can immediately activate public life on the streets and generate additional patrons of street-friendly retail businesses.

Outlined below are specific policy recommendations designed to facilitate shared parking and the creation of a "park once" district in Kaka`ako.

Action PT4.1 Work with property owners and businesses to ensure that existing private parking is made available to the public when not needed for its primary commercial use

There are a number of steps that HCDA can take in encouraging existing property owners to make their parking facilities available for public use during off hours. One of the primary obstacles to this practice for many property owners is concern about liability. To eliminate this concern, HCDA (or the City/County of Honolulu) can work with developers and land owners to eliminate liability for public use of private parking. The City of Sacramento has successfully adopted this practice. In some cases, the HCDA or the City may also wish to take over operating responsibility for privately owned parking during periods of public use.

Seattle's ePark system directs visitors to the most immediate parking and tells them how many stalls are available.
Image from Nelson\Nygaard

Action PT4.2 Maximize use of the existing parking supply by improving wayfinding and parking information

The HCDA should establish a wayfinding program specifically tailored to maximize utilization of the shared parking supply. Signs (including signs providing real time information, if necessary) can direct motorists to underutilized facilities, freeing up the most convenient "front-door" curbside spaces, and maximizing the efficiency of a parking system. Improved wayfinding in the form of new signs helps maximize the use of off-street parking facilities, representing another way to help eliminate traffic caused by cars circling for on-street parking. Wayfinding helps dispel perceived (but not actual) shortages in parking.

RECOMMENDED RULE CHANGES FOR KAKA`AKO

The following Code adjustments are recommended to promote shared use parking.

- **Regulation PT4.1:** Require that all newly constructed private parking provided in any Kaka`ako in commercial or residential developments in excess of *existing minimum parking requirements* be made available to the public.

  Discussion of regulation PT4.1: Under this regulation, developers would be permitted to build as much parking as the development requires. However, when parking is provided that exceeds the minimum requirements under today's regulations, the additional parking would have to be made available to the public. HCDA would work in partnership with developers to eliminate their liability for public parking on site. This arrangement would be particularly helpful, for example, in large residential developments with a significant number of non-resident owners. During periods of time when a small number of owners are on-site, the remaining number of parking spaces could be made publicly available. This reserve of parking could be used, for example, to provide park-and-ride access to the HART stations.
- **Regulation PT4.2:** Allow parking to be shared among different uses within a single mixed-use building by right.

Unbundled Parking

Parking costs are frequently subsumed into the sale or rental price of offices and housing. Although the cost of parking is often hidden in this way, parking is never free. Each space in a parking structure can cost $40,000 or substantially more. "Unbundling" these parking costs from the cost of other goods and services is a critical step for reducing parking demand and vehicle trips, because providing anything for free or at highly subsidized rate encourages use and means that more parking spaces have to be provided to achieve the same rate of availability. Further, by "daylighting" the cost of parking, new tenants may reconsider their need for multiple dedicated parking spaces.

Strategy PT5 Unbundle parking costs from housing costs

For both rental and for-sale housing in multifamily buildings, the full cost of parking should be unbundled from the cost of the housing itself by creating a separate charge. (The exception to this policy should be any new residence with individual garages, such as townhouses, rather than common, shared parking areas). Regulations should require that when residential parking is unbundled, it should be leased, rather sold, to homebuyers. While some homebuyers would shy away from purchasing a unit without parking included because of the fear that it could not be easily resold, a residential building with an available supply of leasable parking spaces allows the homeowner to acquire or forgo parking as their needs change.

This policy provides a financial reward to households that decide to dispense with one or more of their cars, and helps attract that niche market of householders who wish to live in a transit-oriented neighborhood where it is possible to live well with just one car or without a car.

Unbundling parking costs also changes parking from a required purchase to an optional amenity, so that households no longer have to pay for parking spaces that they do not need or cannot afford. This strategy also has significant potential rewards for the district as a whole: with lower rates of auto ownership, many households will shift trips to other modes of transportation, reducing total vehicle trips and total emissions.

RECOMMENDED RULE CHANGES FOR KAKA`AKO

The following Code adjustments are recommended to promote unbundled parking for housing.

- **Regulation PT5.1:** The cost of parking is required to be unbundled cost from the cost of rental housing.
- **Regulation PT5.2:** The cost of parking is required to be unbundled cost from the cost of ownership housing.

Strategy PT6 Unbundle parking costs from commercial leases

New commercial developments should be required to unbundle parking costs by leasing parking spaces separately from the commercial space, and should be required to allow employers to lease as few parking spaces as they wish. This policy also makes it easy for employers to implement a parking "cash-out" program. In a parking cash-out program, employees who choose not to drive to work are given a cash reimbursement instead of receiving subsidized parking from their employer. Employers can save money by leasing fewer parking spaces when fewer employees drive. The policy also makes it easier to institute shared parking arrangements, because building owners can more easily lease surplus parking spaces to other users.

RECOMMENDED RULE CHANGES FOR KAKA`AKO

The following Code adjustments are recommended to promote unbundled parking for commercial leases.

- **Regulation PT 6.1:** In commercial leases, parking must be included as a separate line item, with the quantity of parking to be leased determined by the lessee.

Tandem and Stacked Parking

Because of the difficulty of constructing underground parking in the district, a significant share of any parking constructed in Kaka`ako may be provided either as podiums at the base of buildings, or in surface lots, both of which can have significant negative impacts on the public realm. Tandem and stacked parking offer the opportunity to reduce these impacts by reducing the amount of surface area required to provide a given amount of parking. Given significant challenges to constructing underground parking in the KCDD, these spatial challenges associated with accommodating parking are particularly acute. High rise development will require up to five stories of parking to support development, if conventional parking design is used. Shrinking the footprint of parking using space-efficient parking strategies can conserve land for active public spaces and more productive land uses.

While the purpose of these strategies is similar, they are implemented differently:

- **Tandem parking.** Calls for an attendant to park two or more cars nose to tail, preventing all but the outermost car from leaving the parking facility independently; however, this allows more cars to fit into the lot by reducing the number of aisles required. In residential development, tandem parking is often unattended, with both parking stalls assigned to the same residence.
- **Stacked/robotic parking.** Stackers perform a similar function, but add vertical capacity; essentially, a hydraulic lifting apparatus raises the first car up, allowing a second car to be parked underneath. However the bottom car must be moved before the stacker can be lowered and the upper car released.

Generally applied in garages or parking lots, both techniques require an attendant to be on duty to move cars if a blocked-in car owner wishes to leave. These work well with valet systems and remote parking. It is important to recognize that these strategies do not reduce vehicle trips or traffic congestion because they do not reduce the total parking supply nor do they provide incentives to shift to other modes of transportation.

Figure 8-4 Robotic vs. Conventional Parking Structures

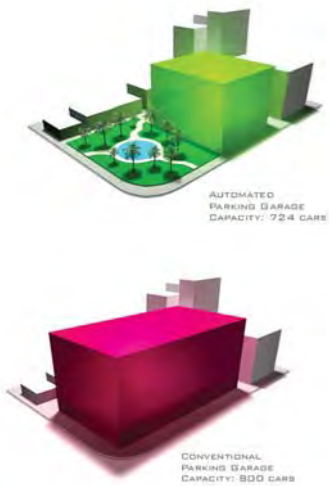


Image from Robotic Parking Systems

Strategy PT7 Tandem and stacked parking permitted by right

This strategy adjusts regulations in the Mauka and Makai Districts so that tandem and stacked parking are permitted by right. As discussed in Strategy PT3 and Regulation PT3.1, because space devoted to parking will be included as part of the permitted FAR for each development project, developers will have a strong incentive to minimize the amount of space dedicated to parking. Tandem and stacked parking offer a set of tools to help accomplish that objective.

RECOMMENDED RULE CHANGES FOR KAKA`AKO

The following Code adjustments are recommended to promote tandem and stacked parking.

- **Regulation PT7.1:** Regulation permitting tandem and stacked parking by right.

Transportation Demand Management Programs

Transportation Demand Management (TDM) refers to a collection of strategies to manage the demand for scarce parking and roadway capacity. They give people incentives to choose alternatives to driving alone by making those alternatives more attractive and convenient. TDM strategies are particularly appropriate for Kaka`ako because they are among the most cost-effective ways to accommodate higher density development without increasing traffic and parking demand. By investing in a strengthened package of parking and transportation demand management strategies, the HCDA can reduce growth in parking demand and decrease new vehicle trips associated with new development.

District Transportation Demand Management (TDM) Requirements

As urban living is making a strong comeback around the U.S., cities are looking to reduce traffic demand and to make streets friendly, livelier, and more social. To do so, many cities require mandatory transportation demand management actions from developers, employers, condominium associations, apartment buildings, and institutions, planned and instituted at the time of development. The TDM strategy for Kaka`ako will include the creation of a Transportation Management Association to promote, implement, and monitor TDM efforts; required TDM plans from all new development; and supporting infrastructure and programmatic investments by HCDA.

Strategy PT8 Establish a Transportation Management Association (TMA)

To encourage transportation Demand Management in Kaka`ako, HCDA should work to establish a Transportation Management Association (TMA). A TMA is a public/private partnership formed so that employers, developers, building owners, and government entities can work collectively to establish policies, programs, and services to address local transportation issues and foster economic development. TMAs are established within a limited geographic area to address the transportation management needs of their members. Their activities can be funded by member dues, transportation revenues from within the district (such as parking fees), or other sources. TMA's provide a variety of services that encourage more efficient use of transportation and parking resources. Such services can include:

- Access Management
- Advocacy
- Education and Outreach
- Flextime Support
- Guaranteed Ride Home Services
- Coordinated Incentive and Reward Programs
- Individualized Commute Trip Planning Services
- Marketing and Promotion
- Parking Management
- Pedestrian and Bicycle Planning
- Rideshare Matching and Vanpool Coordination
- Shared Parking Coordination
- Telework Support
- Transit Fare Products and/or incentives
- Transit Improvements
- Transportation Access Guides

In addition to developing and coordinating transportation management strategies, a TMA can bring a variety of stakeholders together to jointly address transportation challenges – and to give stakeholders a unified voice in advocating for enhanced transportation investments and coordination in their area.

Action PT8.1 Fund, market, and house a new TMA for the District

HCDA will provide initial start-up funding, marketing, and office space for a new TMA for the Kaka`ako district. As the TMA develops, ongoing funding may be obtained through membership dues, or rules could be established to fund the TMA through development fees and/or parking revenues. A

more detailed feasibility study and district outreach campaign would be needed to determine support and proper timing to develop and launch a TMA.

Strategy PT9 Require TDM for new residential developments

HCDA will require that each new multifamily residential development in the district join the TMA and develop a TDM Plan. A TDM Plan is a written document that outlines strategies, targets, and evaluation measures that will be taken to reduce single-occupancy vehicle (SOV) travel to and from the site. The plan should be created during the development process prior to project approval, and any programmatic elements should be carried out by the property manager (for rental properties) or homeowner's association (for condominium properties). These groups could either implement the elements of the plan themselves, or cede implementation activities to TMA staff. Residential developments will have the option of contracting with the TMA to create the TDM plan At a minimum, TDM Plans shall include the following:

- Project description; if this is provided in the land use application, the TDM Plan should reference the land use application
- The TDM strategies proposed for implementation (per Figure 8-5 below)
- Mode share performance targets
- A schedule for achieving mode share performance targets
- Copies of documentation to ensure deed notification of mandatory participation in the final TDM program to all subsequent purchasers and owners of the project.

TDM Plans shall identify strategies to achieve adopted mode split targets. The effectiveness of each TDM strategy varies based on land use, type of development (new or existing development), and geographic location. There is no single TDM measure that can effectively reduce a project's traffic impacts. As such, the HCDA can work with the applicant to develop a reasonable, relevant, and effective TDM Plan.

The TDM Program Strategies Menu in Figure 8-5 below provides a framework of options from which the TMA can help applicants identify appropriate actions to mitigate the traffic impacts of their project and sustain non-auto travel to the site for the lifetime of the building. TDM program strategies are organized by the type of program (i.e. incentive, programmatic, supportive facilities). In some circumstances, TDM strategies can be better implemented at the development phase (by a developer or property owner), while others will be implemented operationally for the lifetime of the project (by the property manager or homeowner's association). Depending on the type of project (location, new vs. existing construction, use), the TDM strategies selected will vary. This menu provides suggested strategies or guidance; it does not represent a comprehensive list of TDM strategies.

RECOMMENDED RULE CHANGES FOR KAKA`AKO

- **Regulation PT9.1:** New multifamily residential developments are required to create and implement a TDM plan that includes at least 5 elements from the checklist of TDM strategies, including at least one element from the 'Incentive' category.
- **Regulation PT9.2:** New multifamily residential developments are required to join the TMA.
- **Regulation PT 9.3:** Residential developments that are TMA members are required to monitor and report (every 5 years) on the status of any goals included in the TDM plan.

Figure 8-5 TDM Strategies Menu

	TDM Element	Program	Residential	Employer	Effectiveness	Strategy type
Incentive	Transit	Provide a subsidized or free transit pass	X	X	High	Operational
	Bike/pedestrian	Offer bicycle commuter benefit		X	Medium	Operational
	Carpool/ vanpool	Provide vanpool/carpool subsidy		X	High	Operational
	Parking	Charge market price for parking		X	High	Operational
	Parking	Offer parking cash-out program		X	High	Operational
Programmatic	Transit	Sell transit passes on-site	X	X	Medium	Operational
	Carpool/ vanpool/shuttle	Sponsor and community vanpool program through coordination, ridematching, and monetary sponsorship	X	X	Low-Medium	Operational
	Carpool/ vanpool/shuttle	Provide shuttle service between site and HART station	X	X	Low-Medium	Operational
	Carpool/ vanpool/shuttle	Provide carpool and vanpool matching services		X	Low-Medium	Operational
	Carpool/ vanpool/shuttle	Offer a guaranteed ride home program		X	Medium	Operational
	Peak hour trip reduction	Support telework or flexible work schedules		X	Medium	Operational
	Information access	Establish an on-site information kiosk with routes, schedules, and fares	X	X	Medium	Operational
	General	Develop "new employee" commute packet on transportation options		X	Medium	Operational
	General	Provide bike/car-share vehicles for worker errands		X	Medium	Operational
Supportive Facilities	Parking	Provide priority parking for carpools or vanpools		X	Medium	Development/ Operational
	Transit	Provide pedestrian-transit amenities such as shelters, sidewalks, footpaths, or signage on-site or close to the site	X	X	Medium	Development
	Parking	Limit on-site parking below existing minimum parking requirements	X	X	High	Development
	Bike/pedestrian	Provide on-site pedestrian circulation system connected to adjacent sidewalks or transit stops	X	X	Medium	Development
	Bike/pedestrian	Provide more bicycle parking than required in code	X	X	Medium	Development/ Operational
	Bike/pedestrian	Install end of trip facilities (lockers, showers, covered bicycle parking)		X	Medium	Development/ Operational
	General	Designate car-share spaces and bike share stations	X	X	Medium	Development/ Operational

Strategy PT10 Require TDM from large employers in new commercial development

HCDA should also require, as a condition of new development, that large employers (those with 50 or more employees) that are owners or tenants of new commercial developments in the district join the TMA and develop a TDM plan. Employers will have the option of contracting with the TMA to create the TDM plan. While commercial development will represent minority of new development permitted under the plan, these regulations can still have a significant effect, particularly on peak period vehicle traffic. Like residential TDM plans, the employer plans should include:

- Project description;
- The TDM strategies proposed for implementation (per Figure 8-5 above)
- Mode share performance targets
- A schedule for achieving mode share performance targets
- Copies of documentation to ensure deed notification of mandatory participation in the final TDM program to all subsequent purchasers and owners of the project.

Employers may select from the employer-specific TDM strategies listed in Figure 8-5 above. The TMA can help applicants identify appropriate actions to mitigate the traffic impacts of businesses and sustain non-auto travel for the lifetime of the building. TDM program strategies are organized by the type of program (i.e. incentive, programmatic, supportive facilities). In some circumstances, TDM strategies can be better implemented at the development phase (by a developer or property owner), while others will be implemented operationally for the lifetime of the project (by the property manager or homeowner's association).

RECOMMENDED RULE CHANGES FOR KAKA`AKO

- **Regulation PT10.1:** Large employers (50+ employees) are required to create, update (every 5 years) and implement a TDM plan.
- **Regulation PT10.2:** Large employers (50+ employees) who are tenants of new commercial developments required to join a TMA that would implement its TDM plan.
- **Regulation PT 10.3:** Employers that are TMA members are required to monitor and report (every 5 years) on the status of any goals included in the TDM plan

TDM Infrastructure and Public Investments

In addition to establishing the TMA and requiring TDM measures from new development, HCDA will pursue operational and infrastructure investments in TDM. These include measures to promote car-sharing and bike sharing, and establishing a multimodal wayfinding program. Bike share and multimodal wayfinding strategies and actions are described in greater detail in Chapter 5 and 6.

Strategy PT11 Promote car-sharing in Kaka`ako

Car-sharing is a "hassle-free" way to rent cars by the hour. Rather than being concentrated at a central location like a rental car company, car-sharing cars are dispersed throughout an urban area at convenient centralized locations, such as residential or commercial developments, civic buildings, or central parking facilities. Car-share operators use telephone and Internet-based reservation systems that are totally self-service. Members are charged hourly and sometimes mileage-based fees for their use and receive a single bill at the end of the month for all their usage.

In 2012, the University of Hawai`i at Manoa started a small car-share operation on campus. Here a car-share vehicle receives a traditional blessing on opening day.
Image from University of Hawai`i at Manoa

Special membership plans for businesses and organizations enable easy access for all employees, which can augment or replace fleet cars or use of personal vehicles for work trips. Car-sharing operators generally have a diverse fleet so that members have access to anything from a compact sedan to a pick-up truck. Car-sharing companies operate throughout the United States and around the world. Currently, two car-sharing companies operate in Hawai`i, each in a small number of select locations: WeCar (a subsidiary of Enterprise), and Greencar (an independent car-sharing company specializing in low-emissions vehicles. Neither company currently operates in Kaka`ako.

Car2Go's fleet is comprised exclusively of branded Mercedes Smart cars, making them easy to identify. San Diego is the first U.S. city to launch an all electric Car2Go fleet.
Image from Car2Go

POINT-TO-POINT CAR-SHARING

Car2Go is one of the fastest growing car-share companies in the United States. Opening in several new major cities each year, the services unique one-way rental feature is proving very popular. Unlike services where a car is checked out and returned to the same location, Car2Go vehicles can be checked out using a magnetic access card, driven anywhere in the service area, and left in any publicly available on-street parking stall. Customers are charged only for the time in use, making short trips very affordable.

Car-sharing can have environmental, economic, and social benefits for both the individual user and for the transportation system and community as a whole. For individuals it can provide cost savings, greater mobility, and convenience. For the community, car-sharing can reduce car ownership and vehicle travel, thereby reducing parking demand, supporting more compact development, and reducing emissions. Car-sharing fleets also tend to be low-emission and fuel-efficient which augments the environmental benefits of reduced driving. Car-sharing offers particular promise for the tourism sector: for visitors who arrive on the island without their own vehicle, car-sharing offers the visitor the opportunity to have access to a car when needed without having to rent one for their entire stay. A hotel or resort could conceivably reduce its guest parking needs substantially by providing moderate size fleet of shared cars. Similarly, government entities could reduce their auto fleet and create a broader public benefit by transitioning some or all of their fleet to a publicly available car-share service.

In order to help establish a car-sharing service in Kaka`ako, HCDA will pursue the following actions:

Action PT11.1 Recruit and provide incentives for car-sharing companies to operate in the district

Recruit an existing car-sharing service provider to expand into the Kaka`ako market. HCDA may consider partially or fully subsidize operation costs for a specified term to help these services begin operating. In the past, localities have encouraged car-sharing by providing minimum revenue guarantees for operators. This provides certainty for the operator, and costs the locality little or nothing if a market develops. HCDA may also wish to consider direct subsidies from sources such as revenues from parking fees or public facilities dedication fees.

Action PT11.2 Reserve some on-street parking spaces for car-sharing vehicles

HCDA will collaborate with the City to reserve a number of on-street parking spaces in strategic locations for car-sharing vehicles.

RECOMMENDED RULE CHANGES FOR KAKA`AKO

- **Regulation PT11.1:** Require that new residential developments with parking provide spaces for car-sharing vehicles.
- **Regulation PT11.2:** Require that visitor accommodations such as hotels and resorts provide developments with parking provide spaces for car-sharing vehicles [the ratio should be higher than for ordinary residential].
- **Regulation PT11.3:** Require that new commercial developments meeting certain requirements provide parking spaces for car-sharing vehicles.

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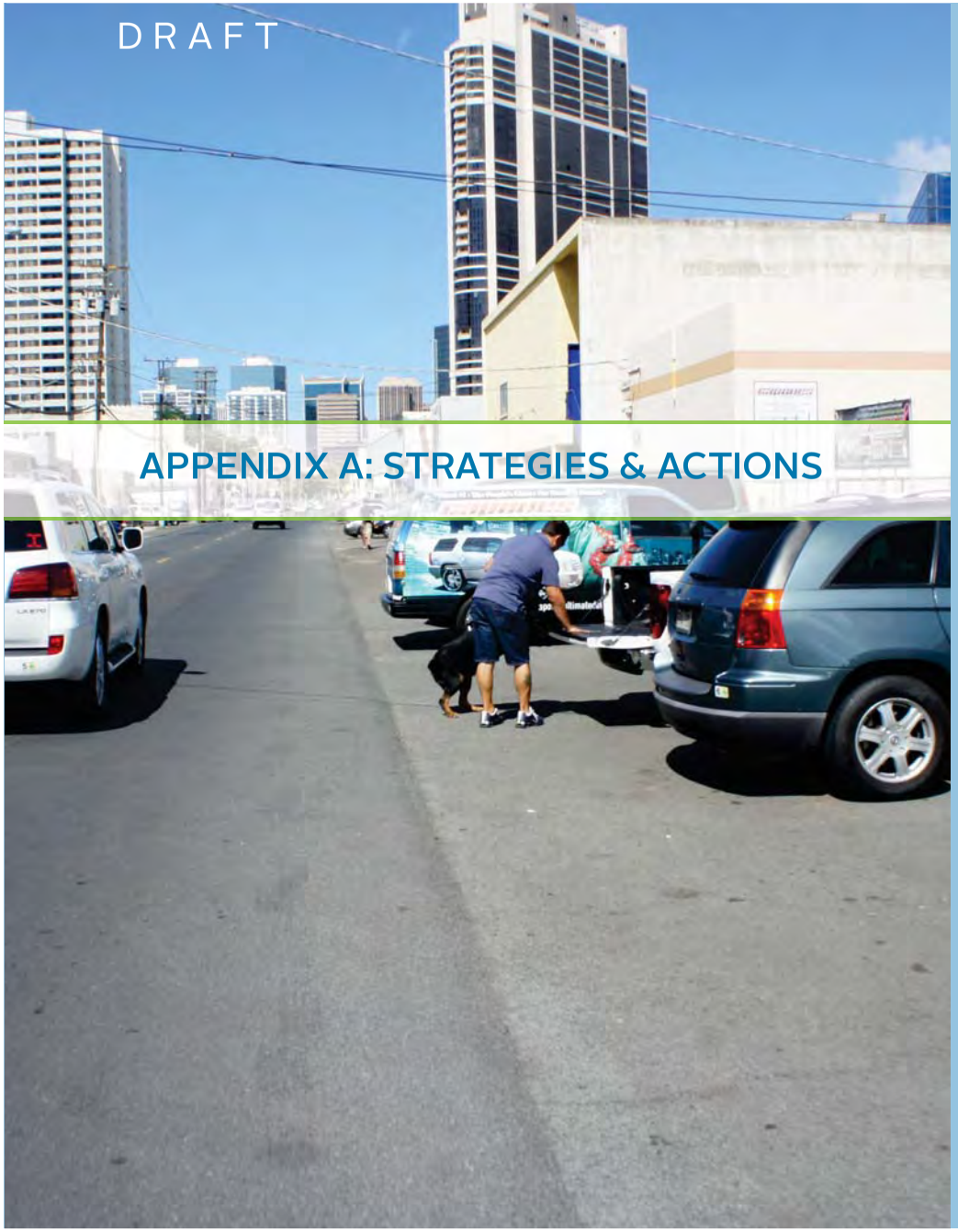

APPENDIX A: STRATEGIES & ACTIONS

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APPENDIX A: STRATEGIES & ACTIONS

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APPENDIX B: RECOMMENDED RULE CHANGES

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APPENDIX B: RECOMMENDED RULE CHANGES

Chapter Five: Mobility & Access

Connectivity

RULE CHANGES FOR KAKA`AKO

Create a Fine-Grained Street Network

- **Regulation MA1.1:** Related to internal connections for large developments, require pedestrian connections or service street between buildings where block lengths exceed 300 ft.
- **Regulation MA1.2:** Related to internal connections for large developments, require through-block pedestrian connections when a substantial portion of a block is developed with commercial projects or when the ground floor uses are largely commercial. In cases where adequate lot size exists to develop two commercial projects on a block, a through block pedestrian connection is required. Connections are required at mid-block and have a minimum clear dimension of 20 feet both horizontally and vertically.
- **Regulation MA1.3:** Require master plans and large developments to achieve an intersection density of 300 intersections per square mile or better, including shared streets, pedestrian ways of 20' or greater, and service alleys designed with adequate space for pedestrian movement.

Plan for Coordinated, Multimodal Transportation Networks

- **See Chapter 6**

Manage Delivery and Parking Access to Reduce Conflicts with Pedestrians and Optimize the Efficiency of the Street Network

- **Regulation MA3.1(a):** Apply Section 15-217-63-B (Parking Access) requiring parking access from an alley or service/parking access street to all parts of the KCDD. Require parking access from alley or service/parking access street for all development sites where 300' minimum street spacing requirements apply.
- **Regulation MA3.1(b):** Expand Section 15-217-63-L (Loading Access) of the Mauka Area Rules requiring on loading zones on thoroughfares and promenade streets to include avenues, particularly those designated for bicycle or high frequency transit uses; Include an exception process if the development site is not sufficient in size to allow an internal alley.
- **Regulation MA3.2:** Restrict curb cuts for drive-through on Commercial Boulevards and Avenues where reasonable alternative access is available; For drive-through uses, prohibit curb cuts and driveways used to approach and exit drive-through facilities, stacking areas for waiting vehicles, and the facility itself, such as a drive-up window or gas pump island.

Make Walking and Cycling Access to Frequent Transit as Direct as Possible

- **See Chapter 7**

Implement a Coordinated Multimodal Wayfinding Program

- **Regulation MA5.1:** Ensure wayfinding placement provisions in Figures PZ1-7 and FT1-12.
- **Regulation MA5.2:** Establish an additional general figure after Figure 1.16 in the Mauka Rules that identifies prospective wayfinding sign locations by type of sign.

Pedestrian

RULE CHANGES FOR KAKA`AKO

The following additions or modifications to the rules for pedestrian quality will govern new development:

- **Regulation MA6.1:** On commercial or mixed-use corridors, buildings are required to have entry points every 60 feet so that pedestrians have numerous opportunities to interact with semi-public spaces.
- **Regulation MA6.2:** Amend §15-217-63-B to encourage street life and to make sure shared parking is viable, parking garages are required to have pedestrian entrances and exits to the street.
- **Regulation MA7.1:** Per §15-217-63-B-1 and 2, parking garage access points must be oriented toward side streets or alleys (Local Streets) to reduce conflict between cars and pedestrians on busy streets.
- **Regulation MA7.2:** In commercial and mixed-use corridors, buildings are required to have at least 70% transparency for ground level frontages to create visual interest for people walking along commercial or mixed-use corridors per §15-217-55-M-6.
- **Regulation MA7.3:** Per §15-217-55-M-6, buildings are required to locate primary entrances along front façades, and locate loading docks or service entries off of street-facing façades.
- **Regulation MA8.1:** Amend §15-217-63-C to define maximum driveway density. Curb cuts and parking garages portals should be restricted to one every tenth of a mile (rounding down). This means some block will not include driveways. Parking garage entrances must be located at the rear or side of buildings accessible by Local Streets (per Chapter 6).
- **Regulation MA8.2:** §15-217-63-C-2 should be revised so that residential curb cuts may be no more than 10 feet wide per lane (two lane maximum at 20 feet) and 12 feet wide per lane (two lane maximum at 24 feet) for commercial curb cuts. This is intended to minimize the impacts to the pedestrian realm and to create more consistent walking paths.
- **Regulation MA8.3:** Amend §15-217-63-I to state that surface parking lots must be screened along the street with landscaping or architectural elements to reduce their visual impact.
- **Regulation MA9.1:** Amend §15-217-39-D-1-7 to include placements standards for bike parking in Figures PZ.1 though PZ.7
- **Regulation MA9.2:** In §15-217-39-D-1-7, change Figures 1.14 (pedestrian zone treatment) and 1.15 (pedestrian zone fixtures) to include acceptable applications, dimensions of bike share stations in the furniture zone and in the frontage zone where property owners integrate bike share stations into the design of setbacks.
- **Regulation MA9.3:** Amend §15-217-63-I to state that multi-story parking in active retail or commercial areas must be wrapped in active uses such as retail to screen parking from the street and to increase street-level activity.

Transit

RULE CHANGES FOR KAKA`AKO

HCDA does not have a direct role in delivering transit services or designing street rights-of-way to accommodate transit operations and passenger loading. However, as the KCDD redevelops, HCDA and its local developer partners will work closely with TheBus (City/County) and HART to ensure transit access and operational considerations are addressed early and throughout the development review process.

- **Regulation MA12.1:** Require developers to construct transit passenger facilities on public right of way where designated/or where there is an existing stop that will require replacement as new public facilities are constructed.

Bike

RULE CHANGES FOR KAKA`AKO

HCDA does not have a direct role in delivering transit services or designing street rights-of-way to accommodate transit operations and passenger loading. However, as the KCDD redevelops, HCDA and its local developer partners will work closely with TheBus (City/County) and HART to ensure transit access and operational considerations are addressed early and throughout the development review process.

- **Regulation MA12.1:** Require developers to construct transit passenger facilities on public right of way where designated/or where there is an existing stop that will require replacement as new public facilities are constructed.

Auto

RULE CHANGE FOR KAKA`AKO

HCDA does not currently regulate the design of traffic facilities in the public right-of-way. Regulatory changes are focused on encouraging developers to provide infrastructure that would help private consumers transition to more sustainable vehicle types.

- **Regulation MA17.1:** Related to the inclusion of EV stations, HCDA will develop rules to support HRS 291 requirements to include at least one EV charging station in publicly accessible parking garages over 100 stalls.

Chapter Six: Complete Streets in Kaka`ako

RECOMMENDED RULE CHANGES FOR KAKA`AKO

The following rules changes are recommended for various roadway and pedestrian design elements of the Mauka/Makai Rules. Additional rule changes will be proposed upon completion of HCDA's forthcoming Complete Streets Design Standards.

- **Regulation CS5.1:** Incorporate the Complete Street types as part of §15-217-38 through 39: The Thoroughfare Plan rules currently focus heavily on the pedestrian realm, so the rules should reflect street types design options, modal trade-offs, and general design guidelines.
- **Regulation CS5.2:** §15-217-39-D-1-7 updated to include allowances and design guidance for the "shared street" designs as part of the Local Streets street type (completed following completion of future HCDA Complete Streets design guide).
- **Regulation CS5.3:** To ensure predictable traffic movement and limit conflicts with pedestrians, parking access lanes, alley or any other Local Street types should be permitted to operate as one-way connection. Additional language should be added to §15-217-63 to clarify this provision.
- **Regulation CS7.1:** In a new section of the Rules, HCDA and DTS should jointly adopt and implement transportation quality and level of service metrics and data collection processes to track the benefits and impacts of implementing the Complete Streets strategy (completed following development of HCDA Complete Streets design guide)..
- **Regulation CS8.1:** Amend §15-217-39-D-1-7 to include the enhancement/buffer zone as part of the sidewalk zone nomenclature and include design elements and programming such as parklets, bike share docking stations, and in-street bike parking corrals.
- **Regulation CS10.3:** Include a new section in the Rules that specifies universal design guidelines based on the recently completed Public Rights-of-way Accessibility Guidelines (PROWAG).

Chapter 8: Parking & Transportation Demand Management

RECOMMENDED RULE CHANGES FOR KAKA`AKO

The following regulatory changes would govern regulation of on-street parking in the Mauka and Makai areas of Kaka`ako.

- **Regulation PT1.1:** Establish on-street parking occupancy target of 85% per block face.
- **Regulation PT1.2:** Implement parking meters where necessary to meet occupancy target (Specifies blocks where parking meters are permitted).
- **Regulation PT1.3:** Enable meters to adjust prices based on demand (Specifies maximum amount that prices can be moved within a specified time period).

The following regulatory changes would remove minimum parking requirements throughout the Mauka and Makai areas of Kaka`ako.

- **Regulation PT2.1:** Minimum parking requirements in the Mauka rules (Section §15-217-63 (e)) are repealed.
- **Regulation PT2.2:** Minimum parking requirements in the Makai rules (Section §15-23-68) are repealed.

The following regulatory changes would remove minimum parking requirements throughout the Mauka and Makai areas of Kaka`ako.

- **Regulation PT3.1:** FAR allocations are inclusive of parking.

The following Code adjustments are recommended to promote shared use parking.

- **Regulation PT4.1:** Require that all newly constructed private parking provided in any Kaka`ako in commercial or residential developments in excess of *existing minimum parking requirements* be made available to the public.

  Discussion of regulation PT4.1: Under this regulation, developers would be permitted to build as much parking as the development requires. However, when parking is provided that exceeds the minimum requirements under today's regulations, the additional parking would have to be made available to the public. HCDA would work in partnership with developers to eliminate their liability for public parking on site. This arrangement would be particularly helpful, for example, in large residential developments with a significant number of non-resident owners. During periods of time when a small number of owners are on-site, the remaining number of parking spaces could be made publicly available. This reserve of parking could be used, for example, to provide park-and-ride access to the HART stations.
- **Regulation PT4.2:** Allow parking to be shared among different uses within a single mixed-use building by right.

The following Code adjustments are recommended to promote unbundled parking for housing.

- **Regulation PT5.1:** The cost of parking is required to be unbundled cost from the cost of rental housing.
- **Regulation PT5.2:** The cost of parking is required to be unbundled cost from the cost of ownership housing.

The following Code adjustments are recommended to promote unbundled parking for commercial leases.

- **Regulation PT 6.1:** In commercial leases, parking must be included as a separate line item, with the quantity of parking to be leased determined by the lessee.

The following Code adjustments are recommended to promote tandem and stacked parking.

- **Regulation PT7.1:** Regulation permitting tandem and stacked parking by right.

Chapter 8: Parking & Transportation Demand Management (Continued)

RECOMMENDED RULE CHANGES FOR KAKA`AKO

- **Regulation PT9.1:** New multifamily residential developments are required to create and implement a TDM plan that includes at least 5 elements from the checklist of TDM strategies, including at least one element from the 'Incentive' category.
- **Regulation PT9.2:** New multifamily residential developments are required to join the TMA.
- **Regulation PT 9.3:** Residential developments that are TMA members are required to monitor and report (every 5 years) on the status of any goals included in the TDM plan.
- **Regulation PT10.1:** Large employers (50+ employees) are required to create, update (every 5 years) and implement a TDM plan.
- **Regulation PT10.2:** Large employers (50+ employees) who are tenants of new commercial developments required to join a TMA that would implement its TDM plan.
- **Regulation PT 10.3:** Employers that are TMA members are required to monitor and report (every 5 years) on the status of any goals included in the TDM plan.
- **Regulation PT11.1:** Require that new residential developments with parking provide spaces for car-sharing vehicles.
- **Regulation PT11.2:** Require that visitor accommodations such as hotels and resorts provide developments with parking provide spaces for car-sharing vehicles [the ratio should be higher than for ordinary residential].
- **Regulation PT11.3:** Require that new commercial developments meeting certain requirements provide parking spaces for car-sharing vehicles.

Appendix B:
Sea-Level Rise Considerations

Kakaako Community Development District
TOD Overlay Plan: EIS
Sea Level Rise Considerations

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Executive Summary

The Kaka`ako Community Development District (KCDD) sits within a relatively low-lying coastal area of Honolulu. Existing work from University of Hawaii's Coastal Geology Group, the National Oceanic and Atmospheric Administration's Sea Level Rise and Coastal Flooding Impacts Viewer and Coastal Storms Sea Level Rise Study provide strong evidence that much of the KCDD will experience persistent flooding with a 1-meter sea level rise. This will be exacerbated with storm activity.

The development and redevelopment of the KCDD poses an interesting planning question because it is a highly used urban area that is proposed to undergo significant redevelopment. This study provides a review of issues and emerging "best practices" in adaptation to sea level rise in urban areas and how they might translate to the KCDD. It reviews Hawaii's climate change adaptation planning efforts and provides a detailed case study of New York City. New York City provides a comprehensive example of citywide adaptation planning, from vulnerability assessment to extensive plan-making. In addition, the region has been a focal point of the Federal government in response to recent disaster events. Key findings are as follows:

1) There is a need for a comprehensive vulnerability assessment and sea level rise mitigation plan for the KCDD. This should build on current estimates of *exposure*, as well as include *sensitivity* and, *adaptive capacity*. This will help to build understanding of "critical thresholds" in the impact of sea level rise to critical infrastructure and population, as well as inform risk and vulnerability in regards to new development.

2) The vulnerability assessment for the KCDD should be made public and widely available to developers, prospective home buyers/renters, and businesses. This would allow private developers and residents to more optimally respond to market signals in regards to risk. At a minimum, current studies about sea level rise in the greater Honolulu area should be shared widely.

3) There should be community engagement in building understanding of risk and resiliency. It is important to build understanding of community needs and willingness to accept risk as it relates to sea level rise, as well as have strong mechanisms to educate people on the expected impacts of climate change.

4) There should be a study estimating the potential costs of sea level rise to the KCDD (and benefits of a variety of adaptive measures). Key considerations are the use of appropriate flood-resilient building materials and design, upgrading of wastewater and drainage systems, as well as road maintenance. These costs, and their distribution, must be understood to aid long-term decision-making.

1. Introduction

Accelerated sea level rise is one of the most certain affects of global climate change (Nicholls et al., 2007). Sea levels are expected to rise by at minimum of 0.6m by 2100 (Nicholls et al., 2007) and an emerging planning norm is to prepare for 1m of rise by 2100 (Parkinson and McCue, 2011). Coastal areas will be exposed to increasing vulnerabilities from erosion and storm surges. This impact will be exacerbated in heavily populated and urban areas (Nicholls et al., 2007). Without appropriate adaptive measures, valuable coastal infrastructure will be damaged by sudden onset events like storms as well as from everyday issues like increased flooding.

There are a plethora of studies suggesting that adaption to sea level rise is important (see for example Johnson, 2007; Deyle et al., 2007, California State Lands Commission, 2009; EPA, 2009, Codiga and Wager, 2011). Many local governments are considering how to incorporate sea level rise in local planning processes. Challenges in implementation, however, exist due to perceptions of scientific uncertainty (Parkinson and McCue, 2011) as well as substantial differences in regional implications of global climate models (Whetton et al., 2012). This means that it is difficult for planners and policy-makers to understand the exact magnitude and timing of sea level rise in any specific locale. Another barrier to action for local government is that adaptation programs require considerable financing (Parkinson and McCue, 2011).

The Kaka`ako Community Development District (KCDD) sits within a relatively low-lying coastal area of Honolulu. The development and redevelopment of the KCDD poses an interesting planning question because it is a highly utilized urban area that is proposed to undergo significant redevelopment. It will be home to three future Honolulu Rail Transit stations. The Transit Oriented Development (TOD) Plan suggests an increase in mixed-use zoning, meaning there will be additional commercial as well as residential activity. Moreover, proposed new infrastructure encompasses high and mid-rise buildings, as well as smaller infrastructure like bicycle sharing stations and increasing public spaces (Sichter, 2013).

The TOD Overlay Plan for the KCDD adopts a planning horizon to the year 2035. While this is a common planning time frame, adapting to sea level rise requires taking a longer-term approach. The typical replacement time for urban infrastructure is about 70 years (Walsh et al., 2004) – well into the decades experiencing impacts from accelerated sea level rise.

This study provides a review of issues and emerging "best practices" in adaptation to sea level rise in urban areas and how they might translate to the KCDD. Section 2 reviews global and Hawaii-specific projections for future sea level. Section 3 identifies best practices in adaptation to sea level rise. Section 4 discusses climate

change adaptation planning efforts, with a case study of New York City. Hawaii's climate change adaptation plans are documented. Section 5 discusses the use and prevalence of sea level rise considerations within environmental review. Section 6 discusses the range of possible impacts to the KCDD. Section 7 provides concluding remarks on potential planning responses to sea level rise in the redevelopment of the KCDD.

2. Global and Local Sea Level Rise

There are two types of sea level rise. The first is global, or eustatic, mean sea level and the second is local relative sea level. Global mean sea level rise is systematically used for sea level rise projections because it most accurately reflects the elevation of sea level due to climate change (Williams, 2013). Local relative sea level includes a combination of phenomenon relating to regional and local geophysical and oceanographic factors (Williams, 2013).

Global Mean Sea Level Rise Projections

Global mean sea levels have been fairly stable for the past 3,000 years until mid-19th century. Global mean sea level in the 20th century began rising at an average rate of 1.7 mm per year and the current average rate is nearly double, at 3.1 mm per year (Williams, 2013). Scientists have shown that acceleration in global mean sea level rise is primarily due to the phenomenon of global warming, or human-induced climate change (Nicholls et al., 2007).

Projections of increases in global mean sea level vary. IPCC 2007 predicted a range of 0.18 to 0.59 meter increase (relative to 1980-1999) by the year 2100 (IPCC, 2007). However, this model excludes "dynamical changes in ice flow," or rapid glacial melting. As more information becomes available, particularly about the impact of glacial melting, it seems that actual increases are on the more extreme end of the spectrum. A more recent synthesis of the science suggests that planning for a range between 0.5 to 2 meters by the year 2100 is advisable (Williams, 2013). Though a range of 4 to 8 meters is possible by 2100, it is not likely until after the 2100 time frame (Williams, 2013).

Hawaii's Sea Level

Local factors affecting sea level are tremendously complex, including issues of land subsidence, isostatic adjustment of the earth's crust, tectonic forces, gravitational changes, ocean circulation and wind patterns (Williams, 2013). While understanding all of the components of local relative sea level would be ideal for planning purposes, it can be challenging to "down-scale" global climate models for regional predictions. This is a growing area of scientific inquiry. In addition, however, there has been global positioning system (GPS) monitoring of tide gauges

in Honolulu as well as data that goes back to the turn of the 20th century. Based on GPS monitoring, there was an increase of approximately 0.5 meters of mean sea level in Honolulu between 1905 and 2006, which amounts to a mean sea level rise trend of approximately 1.5 mm per year (NOAA, 2013). This is slightly lower than the global mean sea level rise of the 20th century. Whereas global mean sea level rose approximately 6 to 8 inches over the past century, Hawaii's sea levels rose approximately 6 inches (though it differs by island) (Codiga and Wager, 2011). That Hawaii's rate of sea level rise is lower than the global average is due to a variety of factors (Codiga and Wager, 2011) and is not necessarily evidence that it will remain so in the future.

In 2011, the University of Hawaii Sea Grant College Program Center for Island Climate Adaptation and Policy released the report *Sea-Level Rise and Coastal Land use in Hawaii: A Policy Tool Kit for State and Local Governments* (Codiga and Wager, 2011). Through consultation with local experts, and considering both global and local factors, Codiga and Wager suggest planning for sea level rise of approximately 1-foot by 2050 and 1-meter by 2100. This is much in line with the planning occurring in other places (see for example Parkinson and McCue, 2011).

Expected Impacts

Accelerated sea level rise will have a range of impacts on coastal areas depending on the topography. Most relevant to urban areas, sea level rise will exacerbate flooding due to poor drainage (Codiga and Wager, 2011). The level of the water table is largely determined by sea level. When the water table rises, existing gravity-driven drainage systems are expected to lose capacity and perform poorly. When coupled with events such as high tides, heavy rain and high surf, this may "lead to large-scale inundation of low-lying areas including coastal roads and Hawaii communities" (Codiga and Wager, 2011, p. 5). An increase in flooding is expected to increase costs for road maintenance (Parkinson and McCue, 2011), as well as for more resilient building design and materials. An example of an area in Honolulu in which this is already occurring during extreme high tides (coupled with heavy rain) is in Mapunapuna (Codiga and Wager, 2011). Continued sea level rise will aggravate coastal erosion and make existing sea walls and other protective measures inadequate (Romine et al., 2013). These effects together make nearby infrastructure and population more vulnerable in general and particularly so during storms.

3. Best Practices in Adaptation to Sea Level Rise

3.1. Typical Planning Responses

Planning responses to sea level rise are generally to *accommodate*, *retreat*, *avoid*, and *protect* (Walsh et al., 2004). These are all considered forms of climate change adaptation.

Accommodate means to continue occupation of the coastal area, but with adjustments to infrastructure and lifestyle. A common example is to alter building codes such that dwellings are raised enough to allow stormwater to travel beneath without substantive damage. Another example is the use of "green infrastructure" such as park areas that are designed to accommodate flooding.

Retreat is the antithesis of accommodate. It implies abandonment of the coastal area by moving infrastructure and peoples. This can mean both the moving of existing infrastructure as well as abandoning and rebuilding in less vulnerable areas. This can occur quickly or slowly, as well as dramatically change location or just mildly. A more mild form of retreat is simply to increase setback laws for new development. Other mechanisms include policies such as rolling easements and government purchase of vulnerable properties (California State Lands Commission, 2009).

Avoidance is a form of "slow retreat," where new development is not allowed in vulnerable coastal areas. Over time, as the old infrastructure reaches the end of its useful life, this effectively results in the relocating of infrastructure and peoples to less vulnerable areas.

Protection entails defending vulnerable areas with engineering-based solutions. This includes "soft" measures such as beach and dune restoration as well as more "hard" measures such as building seawalls, levees, and revetments. Enhancing drainage systems, for example through pumping, also offers a form of protection.

The decision to accommodate, retreat/avoid or protect really depends on the value of the threatened land (both natural ecosystems and built), the cost of protection, and the existence of other inhabitable areas (Parkinson and McCue, 2011).

Existing Urban Areas

There is a general notion that existing urban areas are best served by protection (Walsh et al., 2004). As an example, Wang et al. (2012) study the interaction of sea level rise, land subsidence and storm surges in the low-lying city of Shanghai, China. They find that under a moderate scenario of 0.4 meters of sea level rise by 2100 (i.e. not fully incorporating projections for accelerated sea level rise), half of Shanghai will be flooded and 46% of the existing seawalls and levees will be overtopped. Their recommendations include: improving municipal drainage systems, reinforcing sea embankments, and increasing the height of coastal seawalls and flood control levees (which are currently more than 6 meters high). In addition, in Shanghai, the rate of land subsidence can be reduced by limiting groundwater extraction and thus water management is a key component of mitigation.

However, a number of other place-specific studies bring into question the conclusion that urban areas necessarily benefit from protective measures. Parkinson and McCue (2011) provide an interesting example of the complexity in weighing the planning responses to sea level rise. In a vulnerability assessment for the City of Satellite Beach, Florida, the authors: 1) develop a three-dimensional model of the area, 2) compile and map critical infrastructure, and 3) quantify the extent to which the area and its critical assets would be submerged by rising sea level through the end of the century with a range of sea level scenarios (up to 1.8 meters). They find that Satellite Beach will lose 5% of its landscape as a result of 0.6 meters of sea level rise. An additional 20% of coastal land is lost with another 0.6 meters of sea level rise. This shows the non-linearity of the problem and demonstrates the "tipping point" between relatively benign and tremendously costly impacts. Seasonal flooding to an elevation of 0.6 meters is expected to begin in 2050 and thus the authors suggest the city has 40 years to develop and implement a successful adaptation plan. They conclude that, because the city is built on a segment of barrier island consisting of porous and permeable sand, increasing hydrostatic pressure from sea level rise will induce the flow of water through the sands. This will render the structures built to prevent flooding ineffective and thus the "engineered solutions employed or proposed to protect other Atlantic Coast cities from rising water will simply not work" (Parkinson and McCue, 2011, p. 221). However, the authors also state that retreat is also not a particularly viable local planning response because the limited availability of land at higher elevations. They suggest that pursuit of a retreat strategy would lead to development leaving the city limits.

Similarly, in a review of planning activities for sea level rise in Australia and New Zealand, Walsh et al. (2004) say that, "for urban areas, accommodation or abandonment is generally not a viable option, as the cost of the infrastructure to be abandoned is often too high" (p. 592). However, the authors go on to say that managed retreat may need to be considered in the long-term as other strategies become cost prohibitive. Protective measures can be thought of as short- to medium-term solutions.

Moreover, there is debate as to the merit of technologically-based solutions in relationship to flood management. There is a view that over-reliance on structural solutions can lead to even larger losses in the case of large storm events (outside of the intended design capacity) as well as encourage risky behavior when people feel more "secure" (Jeffers, 2013). These factors should be considered in any cost-benefit analysis determining the merits of protective measures.

New Development

There is also general agreement that new urban development is best in less-vulnerable areas. This can occur by increasing coastal setback laws and meeting of other development requirements based on vulnerability. However, accommodation

through improved building materials and design can help protect development from flooding and storm activity (California State Lands Commission, 2009). For new development in high-risk areas, the California State Lands Commission (2009) recommends development of expendable or moveable structures.

3.2. Assessing Vulnerability

There are a variety of ways to think about the vulnerability of infrastructure and peoples to natural surroundings. The Intergovernmental Panel on Climate Change (IPCC) defines vulnerability as, "the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity" (Parry et al., 2007). By this definition, the main components are *exposure*, *sensitivity*, and *adaptive capacity* (Sahin and Mohamed, 2013). *Exposure* refers to incidence of physical impacts (such as sea level rise and storm activity) while *sensitivity* accounts for the interaction with human and natural systems (such is impacts to critical infrastructure or wetlands). *Adaptive capacity* refers to the ability of the system to respond.

A technocratic approach to assessing vulnerability focuses on measuring *exposure* and *sensitivity* to physical hazards and suggesting technologically-based solutions (Jeffers, 2013). This is the approach taken by Parkinson and McCue (2011) and Wang et al. (2012) in their studies of Satellite Beach, Florida and Shanghai, China, respectively. Due to the relatively straight-forward nature of the analysis, this is a common approach to assessing locational vulnerability to sea level rise and flooding.

Social scientists, however, continue to make the point that vulnerability is really the combination of the biophysical risk and the ability of peoples to react to it (Jeffers, 2013; Thatcher et al., 2013). Thus socio-economic factors are equally important (i.e. *adaptive capacity*). Though studies suggest a variety of ways to incorporate socio-economic factors of vulnerability, the lack of standardized methodology limits its widespread application (Jeffers, 2013). Understanding the social dimension is crucial, however, particularly in the case where the study area covers a widely heterogeneous population.

Several studies bring in economic considerations as a social dimension to understanding vulnerability. They find that it is the coupling of physical vulnerability with centers of economic development and critical infrastructure that lead to high levels of vulnerability. Thatcher et al. (2013) construct a Coastal Economic Vulnerability Index in a study of the Northern U.S. Gulf Coast. The index is based on 1-kilometer segments where socio-economic variables include population, urban land cover, and the economic value of key infrastructure (including residential and commercial buildings). This study builds on earlier work of Pendleton et al. (2010) that develop a Coastal Vulnerability Index, which focuses

solely on physical variables related to rising sea levels. For both studies, a 1-meter elevation threshold is chosen. The authors find that the most vulnerable areas result from a combination of physical vulnerability and a concentration of economically valuable infrastructure. They find that Lafourche Parish, Louisiana has the highest "index score" because of its energy infrastructure (deepwater oil platforms and refineries), high local shoreline erosion rates and high relative sea level rise. The authors find less vulnerable areas are characterized by low population density, urban development, and physical risk. The authors find that incorporating economic values into the vulnerability index substantially changes the results of the earlier study and would lead to different responses in terms of resource allocation for regional adaptation.

In an analysis of Norway, Aunan and Romstad (2008) find that the "extensive and well-developed infrastructure of roads, bridges, and ferries linking cities, towns and villages is likely to be negatively affected by sea level rise, particularly if this is concurrent with an increased risk and height of storm surges" (pp. 403). Densely populated areas, particularly with economic activities such as fishing, power production, and agriculture may experience considerable economic and material damage. Though the socio-economic impacts could be substantial in certain parts of Norway, particularly on the western coasts, they conclude generally that Norway as a whole "will *not* be seriously affected by accelerated sea level rise" primarily due to steep slopes and high elevation (pp. 403).

Economic vulnerability is, however, only one component of *adaptive capacity*. To develop a more holistic understanding requires knowledge of social networks and regional institutions (see discussion in Glaas et al., 2010). In a study on the vulnerability of Indian coasts to accelerated sea level rise, Kumar and Tholkappian (2006) use literacy and "spread of institutional set-up" as the social dimensions of *adaptive capacity*. These kinds of indices vary within the literature and are highly contextual.

3.3. Decision-Making Frameworks

The difficulty of decision-makers to proactively respond to accelerated sea level rise is often due to the complexity of environmental systems and conflicting viewpoints of stakeholders (Sahin and Mohamed, 2013). Because it is imperative that coastal communities respond to accelerated sea level rise, new decision-making models are warranted. Methods are emerging to help decision-making in the case of uncertainty.

Sahin and Mohamed (2013) suggest a Spatial Temporal Decision framework to assess coastal vulnerability and local adaptation alternatives. The decision-making framework combines a dynamic spatial model (physical and temporal) with a multiple-criteria-decision-aid approach. A multiple criteria decision model is a tool used to prioritize policy or planning actions, mainly through the eliciting of

information from stakeholders in a systematic and quantifiable way. The criteria used within this analysis are based on the *applicability*, *effectiveness*, *sustainability*, *flexibility*, and *cost* of a range of adaptation options; namely, *retreat*, *improve building design*, *improve public awareness*, *build protective structures*, and *take no action*. The Spatial Temporal Decision framework process consists of: 1) problem identification, 2) vulnerability assessment using the dynamic spatial model (which is a GIS analysis with a temporal dimension), 3) assessing adaptation strategies using the multiple criteria decision-making aid, 4) testing the preferred adaptation strategies chosen by the stakeholders to see if it provides an effective adaptation solution, and 5) refining the model and/or eliminating solutions that are shown to ineffective. It is an iterative decision-making framework working between physical and stakeholder-based information. In an application to the Gold Coat in Southeast Queensland, Australia, the authors find that residents are more likely to prioritize *improving building design* and to *build protective structures*. The least preferred option amongst residents is to *take no action* or *retreat*. Those deemed experts in the field, however, gave the highest priority to *improve public awareness*, then to *improve building design* and *retreat*. Politicians were found to prioritize *improving building design* and *retreat*. *Improving building design* was overall the adaptation strategy with most support. Interestingly, *effectiveness* and *sustainability* were found to be the two most important criteria among all stakeholder groups, while *cost* was the least. In addition, *improving building design*, which includes flood proofing, elevated building designs, and minimum flood levels, was found to provide more physical protection to vulnerable populations than *protective structures* such as sea walls within simulation analysis. However, this finding diminished greatly after a 1.5 meters rise in sea level.

In an ideal world, planners would like a projection for a particular rate of sea level rise associated with a certain probability (Walsh et al., 2004). Several studies have done a risk assessment, and estimated the probability distribution for a single outcome (Walsh et al., 2004). These are difficult, however, to use "off the shelf" for regional planning purposes. Generally, the range of sea level rise scenarios is not so cleanly linked to a probability distribution. In addition, the level of expert, policy-maker and stakeholder engagement required by Sahin and Mohamed's (2013) iterative decision-making approach may prove to be prohibitive from a cost and time perspective.

Alternatively, scenario planning is a way of building understanding of a range of outcomes (Moore et al., 2013). This also allows identification of "critical thresholds," where interactions with other regional factors make that level of sea level rise particularly damaging. A study by Zhang et al. (2011) on the impacts of sea level rise in the Florida Keys provides a good example. The authors find that 0.6 meters of sea level rise by 2100 would inundate about 70% of total land surface, 17% of population and 12% of real property. A 1.5 meters rise, however, would inundate 91% of the land surface, 71% of the population and 68% of real property. Although much of the land surface is affected in both scenarios, it is in the second scenario that residential and commercial areas are extremely impacted.

4. Climate Adaptation Planning in Hawaii and the U.S.

Climate Adaptation Planning includes risk and vulnerability assessments, identification of policies, prioritization of projects, funding and allocation of human and financial resources as well as the deployment of information sharing and decision-support tools (Cruce, 2009). The field of climate adaptation planning is relatively nascent and constantly evolving. The development of state and local climate adaptation plans varies widely, as the impacts that specific locations expect often drive the content, as well as any regional opportunities to mitigate impacts. This means that greenhouse gas emissions reduction strategies are sometimes included within adaptation plans. Fifteen U.S. states have completed Climate Adaptation Plans and four are in progress (C2ES, 2013). By this count, Hawaii is considered a State "in progress."

Whether states have officially completed an adaptation plan, coastal areas in the U.S. and around the world have been tremendously active in developing strategies to adapt to accelerated sea level rise. In fact, there are far too many to document and comprehensively review. Moreover, they vary widely in their reflection of regional needs and capacity. Common themes address issues of freshwater supply, flooding, wastewater management, transportation and building impacts (see Bloetscher et al., 2011; Deyle et al., 2007; and Johnson, 2000 for illustrative examples in Florida and Maryland). General responses range from outreach and education, improved building design and proactive zoning, realigning insurance and market incentives, to disaster recovery efforts.

This section highlights the activities of Hawaii and New York City (NYC) in climate change adaptation planning. NYC is perhaps the most illustrative example of comprehensive citywide adaptation planning, from vulnerability assessment to extensive plan-making. In addition, the region has been a focal point of the Federal government in response to recent disaster events. The Hurricane Sandy Rebuilding Task Force released their strategy report in August 2013.

For a more comprehensive list of climate change adaptation plans internationally, see the New York City Panel on Climate Change (2010), Appendix C.

4.1. Hawaii's Climate Adaptation Planning Processes

State Policies

In a publication by the Center for Island Climate Adaptation and Policy at the University of Hawaii Sea Grant College Program, it aptly says that, "adaptation is 'on

the radar' for state and local decision-makers…" (ICAP, 2012) – implying that both much has been and needs to be done.

In 2009, Act 20 created a Climate Change Task Force that was to identify adaptation actions for Hawaii. The Task Force was never funded or convened. It ceased to exist in 2011. Nevertheless, a series of stakeholder-driven workshops were held in conjunction with the *Ocean Resource Management Plan*, with funding support from the Army Corps of Engineers and the National Oceanic Atmospheric Administration, which resulted in *A Framework for Climate Change Adaptation in Hawaii* (ORMP, 2009). The framework suggests to:

1) Build a Climate Change Adaptation Team;

2) Develop and Adopt a Long-Term Vision;

3) Identify Planning Areas and Opportunities Relevant to Climate Change;

4) Scope Climate Change Impacts to Major Sectors;

5) Conduct a Vulnerability Assessment;

6) Conduct a Risk Assessment;

7) Prioritize Areas for Adaptation Planning;

8) Set Preparedness Goals;

9) Develop, Select, and Prioritize Preparedness Actions;

10) Implement Preparedness Plan; and

11) Monitor Progress and Update Plan as Appropriate (ORMP, 2009).

This provides the groundwork in determining key components of Hawaii's future climate change adaptation plan.

As a next step in creating overarching guidelines for adaptation in Hawaii, Act 286 was passed in the 2012 legislative session (Office of Planning, 2013). Act 286 aims to prioritize guidelines to prepare the State to address impacts of climate change. The priorities are to:

1) Ensure that Hawaii's people are educated, informed, and aware of the impacts climate change may have on their communities;

2) Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies;

3) Invest in continued monitoring and research of Hawaii's climate and the impacts of climate change on the State;

4) Consider native Hawaiian traditional knowledge and practices in planning for the impacts of climate change;

5) Encourage the preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, forests, streams, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change;

6) Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;

7) Promote sector resilience in areas such as water, roads, airports, and public health, by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;

8) Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other non-governmental entities, including nonprofit entities;

9) Use management and implementation approaches that encourage the continual collection, evaluation, and integration of new information and strategies into new and existing practices, policies, and plans; and

10) Encourage planning and management of the natural and built environments that effectively integrate climate change policy (HRS 226-109).

These priority guidelines are now "part of the statewide planning system, which coordinate and guides all major state and county activities and implements Chapter 226. As a priority guideline, climate change must now be considered in state and county budgetary, land use and other decision-making processes" (ICAP, 2012). However, actions may differ from the adaptation guidelines, in some circumstances, without penalty (ICAP, 2012). In addition, because the guidelines are at a relatively high-level, there is broad space for interpretation of what constitutes, for example, "encourag[ing] planning and management of the natural and built environments that effectively integrate climate change policy." The word "encourage" is non-binding while reference to effectively integrating climate change policy is vague, given there is currently little actual policy other than the guidelines themselves. These guidelines nonetheless serve as a foundational framework for prioritizing adaptation planning activities in Hawaii as well as for incorporating future climate change policies. The Office of Planning is "currently working with various

stakeholders, primarily through the *Ocean Resource Management Plan* program, to implement this policy" (Office of Planning, 2013).

County Setback Policies

Under Hawaii Revised Statutes (HRS) Chapter 205A, the Coastal Zone Management (CZM) law, the State governs activities that occur in coastal areas. The state shoreline setback is not less than 20 feet and not more than 40 feet inland from the shore (HRS 205A-42(a)). The authority to implement rules is given to the counties, including supplemental shoreline setback rules. Counties additionally govern coastal development by the issuance of Special Management Area (SMA) Permits and Shoreline Setback Variances (SSV).

Maui and Kauai counties in 2007 and 2008, respectively, implemented erosion-based setback laws. This is a form of *retreat* and *avoidance* for new development. Maui County's previous setbacks ranged between 25 and 150 feet depending on lot depth. For properties with an average depth of less than 100 feet, for example, the setback for development was 25 feet. Maui County's newer setback law takes the rate of erosion for the specified lot multiplied by 50 (years) with an additional 20-foot buffer. If this newly calculated setback is less than the previous one, the former is accepted.

Kauai County's shoreline setback line is the sum of 40 feet plus 70 (years) multiplied by the average annual erosion rate for the parcel (Codiga and Wager, 2011). The selection of seventy years reflects a finding that this is the average life-span of wood-framed coastal structures (Codiga and Wager, 2011). Kauai's rules provide for a 10% adjustment in the average annual erosion rate for future sea-level as well as a minimum buildable footprint allowance of 1,500 square feet. This is intended to avoid potential regulatory takings claims (Codiga and Wager, 2011).

For both the City and County of Honolulu and Hawaii County, the shoreline setback is generally a minimum of 40 feet. On Oahu, an exception is made in the case of small lots, in which the setback can be 20 feet. For new subdivisions, it is 60 feet (Hwang and Burkett, 2009). For a more detailed account of county shoreline setback plans and policies, see Hwang and Burkett (2009) and Codiga and Wager (2011).

Regional Plans

Several regional plans have begun to address issues of sea level rise. For example, the 2010 Hilo Community Development 5-Year Action Plan Update includes a strategy for including "sea level rise data in long-term implementation strategies" (Gagorik et al., 2010). In the 2012 Koolau Loa Sustainability Communities Plan update on Oahu, a new shoreline areas guideline is to, "evaluate emerging policies relating to climate change and sea level rise" (City and County of Honolulu, 2012).

More comprehensively, the 2012 Maui Island Plan acknowledges that sea level rise will affect Maui's coastal areas and that "prudent land use planning will consider possible sea level rise as a variable in the future." It includes a policy to develop plans that "encourage rebuilding inland as an alternative to shoreline hardening," "streamline the reconstruction of structures that are moved substantially inland," "encourage the relocation of existing structures so they are away from shoreline areas," and "encourage the relocation of vulnerable coastal roads." In addition, the plan says that coastal planning requirements must be updated to account for rising sea levels. These all fall under the objective of achieving "greater protection of life and property" (County of Maui, 2012).

ICAP Recommendations

In the Center for Island Climate Adaptation and Policy's study on *Sea-Level Rise and Coastal Land Use in Hawaii*, Codiga and Wager (2011) identify three main recommendations:

1) The governor or state legislature should direct state agencies to incorporate a sea-level rise benchmark of 1-foot-by-2050 and 3-feet-by-2100 in planning and permitting processes and decision-making, similar to the approach taken by the U.S. Army Corps of Engineers and to an executive order issued in California.

2) Scientific research must be expanded. Policy tools addressing sea-level rise derive legitimacy from the strength of the supporting science. Funding and support for continued scientific research, ultimately to establish site-specific estimates of sea-level rise impacts, is imperative.

3) A lead agency or task force, charged with initiating statewide adaptation planning to facilitate coordination and collaboration among various agencies and stakeholders, should be established. This entity will increase access to information, promote consistency among adaptation planning efforts, and create the statewide vision that is crucial to successful sea-level rise adaptation.

The first recommendation of setting a planning benchmark for expected sea level rise serves to empower existing processes, such as SMA and SSV permitting, to more keenly consider accelerated sea level rise in the granting/denial or mitigation/conditions of such permits. In addition, it might also support the systematic consideration of sea level rise within environmental review for projects within coastal areas.

The second recommendation is more general, but implies increasing capacity of researchers who conduct regional sea level rise and erosion analyses, such as the UH Coastal Geology Group and Sea Grant College. The third recommendation speaks to the larger need for the creation of a comprehensive adaptation plan.

In addition, Codiga and Wager (2011) identify planning, regulatory, spending, and market-based land use policy tools that state and local government in Hawaii should consider amending to address sea level rise. They are:

1) Planning tools include the Hawaii Coastal Zone Management Act, comprehensive plans, and pre-disaster mitigation plans.

2) Regulatory tools include zoning and overlay zones, floodplain regulations, shoreline construction setbacks, coastal construction control lines, hard armoring, rebuilding restrictions, building codes and resilient design, subdivision approvals, cluster development, land development conditions, **environmental review**, rolling easement statutes, non-structural armoring, and buffer zones [emphasis added].

3) Spending tools include capital improvement programs, land acquisitions, conservation easements, and rolling conservation easements.

4) Market-based tools include mandatory real estate disclosures, tax incentives, and transfer of development rights programs.

The identified tools can be implemented at both state and county government levels and requires policy change to fully utilize their mechanisms.

4.2. New York City: An Exemplary Case

NYC is emerging as a national and international leader in responding to climate change. Their climate change adaptation planning process to date is the most comprehensive of any U.S. municipality.

Projections suggest that NYC may face a 4-7.5°F increase in its mean annual temperature, a 5-10% increase in its baseline rainfall and 12-23 inches of sea level rise by 2100 (NPCC, 2010). This means that NYC's *exposure* to (slow and rapid) hazards is increasing as a result of climate change. As one of the world's densest cities, home to some of the world's most famous high-rise buildings, and with critical infrastructure like airports and subways within the current flood plain, NYC is highly *sensitive* to climate change impacts. NYC's general affluence means that at a citywide level it has a relatively high *adaptive capacity.* The ability of any individual person, household or business to adapt to sudden change, however, will vary widely and is difficult to capture on a citywide level. NYC's overall high level of adaptive capacity, however, means that much planning has already occurred on strategies to respond to accelerated sea level rise.

In 2004, the NYC Department of Environment launched a climate change adaptation initiative. A Task Force was created to ensure that departmental planning 1) take(s)

into account the potential risks of climate change on the city's water supply, drainage and wastewater management systems, and 2) integrate(s) greenhouse gas emissions management (NPCC, 2010, pp. 19). The Task Force consists of over 40 public-and private-sector stakeholders. In 2008, the NYC Panel on Climate Change (NPCC) was created to assist the Task Force. It prepared a set of climate change projections for the NYC region as well as examined impacts to critical infrastructure (NPCC, 2010, p. 7). The NPCC was convened by Mayor Bloomberg and funded by the Rockefeller Foundation. The NPCC has produced a variety of reports, from technical risk and vulnerability analyses to a more comprehensive adaptation planning response. NPCC (2010) documents the series of vulnerability assessments completed in order to reach its' final recommendations. One of the particularly interesting analyses includes assessment of flooded areas in a 1-in-100 year flood zone with a variety of sea level rise scenarios (ranging from 9 to 53 inches). A major emphasis of impacts throughout the NPCC's documents is on the confluence of sea level, increased flooding and the incidence of extreme storm events. Expected impacts from accelerated sea level rise in NYC are:

Higher Average Sea Levels – *Highly Likely* (based on IPCC definition)

1) Encroachment of saltwater on freshwater sources and ecosystems, increasing damage to infrastructure not manufactured to withstand saltwater exposure.

2) Increase in pollution released from brownfields and other unprotected waste sites.

3) Inundation of low-lying areas and wetlands, and higher rates of beach and salt marsh erosion.

4) Increase of inflow of seawater to sewers and Wastewater Pollution Control Plants (WPCP) and reduced ability of discharging CSO and WPCP effluent by gravity.

5) Increase of salt front up the Hudson and Delaware Rivers, leading to reduced supply of drinking water.

More Frequent and Intense Coastal Flooding &
Shortened 100-Year Flood Recurrence Period – *Very Likely* (based on IPCC definition)

6) Increase in street, basement and sewer flooding.

7) Increase in flood risk to low-elevation infrastructure and wastewater treatment plants

8) Increase in delays on public transportation and low-lying highways.

9) Increase in structural damage to infrastructure due to flooding and wave action.

10) Increase in need for use of emergency management procedures.

The adaptation planning report, published in 2010, is particularly useful for understanding planning responses and policies to address sea level rise in a highly urbanized area. The major findings are:

1) New York City should begin to adapt to climate change today.

This speaks to the need to move forward even in the face of uncertainty. *Ad hoc* reactions to extreme climate events are found to not ensure long-term sustainability of the city.

2) New York City already faces a number of climate risks even without climate change as a factor.

The city is already quite vulnerable to disaster events, such as heat waves, storm surge, and floods, and this will just be further exacerbated by climate change impacts.

3) There is a potential for "tipping points" in the climate system, such as a rapid melt of polar ice sheets, which would have a great magnitude of consequence on the city.

This means that further monitoring is necessary to ensure that impacts can be properly assessed and with appropriate planning responses.

4) To effectively respond to climate change, the City should develop Flexible Adaptation Pathways.

This is a set of strategies that can evolve through updated climate risk assessments, evaluation of adaptation strategies and with additional monitoring. These pathways should be implemented by relevant agencies and organizations that manage the city's critical infrastructure.

The NPCC (2010) identifies eight recommendations for action. They are to:

1) Adopt a risk-based approach to develop Flexible Adaptation Pathways.

2) Create a mandate for an ongoing body of experts that provides advice and prepares tools related to climate change adaptation for NYC.

3) Establish a climate change monitoring program to track and analyze key climate change factors, impacts and adaptation indicators in NYC.

4) Include multiple layers of government and a wide range of public and private stakeholder experts to build buy-in and crucial partnerships for coordinated adaptation strategies.

5) Conduct a review of standards and codes to evaluate their revision to meet climate challenges.

6) Work with the insurance industry to facilitate the use of risk-sharing mechanisms to address climate change impacts.

7) Focus on strategies for responding to near- and mid-term incremental changes (e.g. temperature and precipitation change) as well as long-term low-probability, high-impact events (e.g. catastrophic storm surges exacerbated by sea level rise).

8) Pay particular attention to early win-win adaptation strategies (NPCC, 2010).

The issue of insurance is particularly interesting and an arena in which a large city, such as NYC, may have sway to change common practices. For example, the National Flood Insurance Program, while certainly successful at provided households in the U.S. flood insurance, is considered generally ineffective at (and perhaps even encouraging of) discouraging building and re-building in high-risk areas (Aerts and Botzen, 2011). The Biggert-Waters Reform Act of 2012 is an example of policy that aims to raise insurance rates for properties in high-risk areas.

Response to 2012 Hurricane Sandy

While no specific storm event can be attributed to climate change, the coupling of storms with sea level rise make coastal areas more vulnerable. Two recent events, Hurricane Irene in 2011 and Hurricane Sandy in 2012 underscore the importance of NYC's climate change adaptation plans and planning efforts.

Hurricane Sandy, that hit the U.S. East Coast on October 29, 2012, is responsible for the deaths of 159 people (Hurricane Sandy Rebuilding Task Force, 2013). It is estimated to have wrought $30 billion in total damages on the U.S. East Coast (Aerts et al, 2013, Appendix J) and another $30 to $50 billion in lost economic activity (Hurricane Sandy Rebuilding Task Force, 2013). There is an estimated two million working days lost. Hurricane Sandy is additionally considered the "worst disaster for public transit systems in the nation's history" (Hurricane Sandy Rebuilding Task Force, 2013). NYC's below ground subway system was shut down (in advance of the storm) and seawater breached into eight subway tunnels. Other major tunnels were breached. Floodwaters, storm runoff, wind damage and power outages contributed to the failure of wastewater treatment plants. Billions of gallons of raw and partially

treated sewage were sent into nearby waterways. Power losses led to the inability of drinking water utilities to provide potable water. In general, much of the economic loss is due to power outages and subsequent effects. Over 650,000 homes were damaged or destroyed (Hurricane Sandy Rebuilding Task Force, 2013).

In response, President Obama signed an Executive Order that established the Hurricane Sandy Rebuilding Task Force. The Task Force released its final report in August 2013. Within its' "rebuilding strategy" it identifies a number of ways in which government can better help communities respond to large disaster events. While the report is focuses on disaster mitigation, it acknowledges that "even a moderate amount of sea level rise will increase the flooding that coastal storm events cause" and thus the interaction between sea level and disasters is paramount (Hurricane Sandy Rebuilding Task Force, 2013, pp. 39). Nine recommendations have implications for areas coping with issues of sea level rise:

1) Giving governments and residents the best available data and information on current and future risks to facilitate good decision making for recovery and planning – for example, by creating and making widely available a Sea Level Rise projection tool.

This recommendation reflects the need for decision-makers to be able to properly assess risk and risk management in regards to coastal planning. A complementary recommendation is to develop a minimum flood risk reduction standard for major Federal investment, which has been adopted in application to projects funded by the "Sandy Supplemental."

2) Leveraging the Rebuild by Design competition to deliver innovative, resilient rebuilding ideas to the Sandy-impacted region.

This recommendation led to a regional design contest that aims to: "promote innovation by developing regionally-scalable but locally contextual solutions that increase resilience to the region, and to implement selected proposals with both public and private funding" (HUD, 2013).

3) Establishing guidelines to ensure those projects are situated and built to withstand impacts of existing risks and future climate change, in the region, and across the country.

4) Making housing units—both individual and multi-family—more sustainable and resilient through smart recovery steps including elevating above flood risk and increased energy efficiency.

These two recommendations are a move to performance standards for building and project resiliency. An example of such standards are, "how strong of a storm system [it] should be able to withstand," or "how long different types of customers can be without power" (Hurricane Sandy Rebuilding Strategy, 2013, pp. 49). While the

focus on the Task Force is on the New York/New Jersey region, the suggestion is to consider such standards nationally. While energy and energy efficiency are an important component of disaster resilience, it is not necessarily directly connected to issues of sea level rise.

5) Assisting States and localities to optimize Sandy recovery infrastructure funding and leverage non-federal resources to help build critical infrastructure assets that are resilient to current and future risks.

This recommendation, while broad, encompasses rebuilding energy infrastructure to be more resilient to disaster events. Other critical infrastructure includes water, transportation and buildings.

6) Encouraging homeowners and other policy-holders to take steps to mitigate future risks, such as elevating their homes and businesses above flood levels, which will not only protect against the next storm but also make their flood insurance premiums more affordable.

This recommendation encompasses issues like raising mechanical devices above expected flood level, wet floodproofing in a basement, and using water resistant paints/materials. The issue of insurance premiums is important in creating proper incentives for building and rebuilding, where a complementary recommendation is to continually assess decreasing premiums for mitigation activities (other than elevation, which is assumed to be effective).

7) Prioritizing the engagement of vulnerable populations on issues of risk and resilience.

8) Helping communities work together to be better prepared at a lower cost for the risks associated with a changing climate.

9) Supporting regional planning underway in New York and New Jersey to create and implement locally-created and federally funded strategies for rebuilding and strengthening their communities against future extreme weather.

These recommendations speak to the need to identify communities most at risk and to provide assistance in understanding vulnerability and appropriate responses. This can be done through planning. There are a number of regional programs, such as the New York Rising Community Reconstruction Program, which helps facilitate a collaborative community planning process. It identifies community needs and gathers data on technical assistance requirements. This kind of group can help to better understand community-level *adaptive capacity*. There are also regional economic development and planning efforts, such as the New Jersey Local Resilience Partnerships.

An interesting strategy identified by the Hurricane Sandy Rebuilding Task Force is land acquisition. In the case of repeated flooding, the report says that government and/or non-profit land acquisition can assist retreat from high-risk areas, and provide land for flood mitigation measures and/or natural areas. The Task Force recommends the Federal Government to consider coordinating the various Federal land acquisition mechanisms for this purpose. Many states also have land acquisition mechanisms.

Infrastructure Cost Implications

In response to the recent catastrophic storm events, Aerts et al. (2013) study the cost of a variety of flood management strategies in anticipation of the long-term sea level rise challenges of NYC. They are categorized into two main strategies: 1) the Resilient Open City and 2) Storm Surge Barriers. The Resilient Open City consists of measures that lower NYC's vulnerability by enhancing building codes and tailoring local-scale flood protection measures. The Storm Surge Barriers consists of building protective infrastructure. A summary of strategies and their related costs is provided in Table 1. Aerts et al. (2013) acknowledge that this provides preliminary cost estimates and that key adaptation categories are missing. Moreover, issues such as permitting are overlooked.

Table 1. Summary of Aerts et al. (2013) Strategies and Costs for NYC

	Description (for NYC and NJ)	Capital Cost	Maint. Cost
		$2012 Billion	$2012 Million
Resilient Open City			
Strategy 1a	Enhancing building code measures in the 1/100 and 1/500 flood zones (elevation of the base floor of houses above base flood elevation; dry- and wet floodproofing for different heights; and applied to existing and new buildings).	$0.7-6.4B	$1M/year
Strategy 1b	Same as 1a, with additional protection of critical infrastructure. Includes local-scale adaptation measures including protection of power plants, water treatment plants, transportation infrastructure and medical facilities.	$10.9-15.1B	$2M/year
Strategy 1c	*Hybrid solution* anticipates uncertainty of future developments and combine elements of the Resilient Open City strategies with local scale protection measures. This includes no-regret measures that strengthen beaches through sand nourishment, protecting low-lying areas with levees (for example, in Red Hook, Hoboken and Manhattan); and measures that minimize environmental impacts such as maintaining salt marshes and wetlands.	$10.4-11.6B	$13.5M/ year
Storm Surge Barriers			
Strategy 2a	E*nvironmental dynamics* strategy aims at maintaining the ecosystem functions of Jamaica Bay and its salt marshes through beach nourishment. The surrounding urban areas, including JFK airport will be protected by levees.	$18.9-23.1B	$98.5M/ year
Strategy 2b	In this scenario, sea levels have surpassed 1 meter +, meaning that it is no longer viable to maintain the Jamaica Bay wetlands. Instead, storm surge barriers will be installed across the Jamaica Bay Inlet. Similar to 2a, low areas will be protected by reinforcing bulkheads, levees or by landfill.	$17.9-23.8B	$126M/ year
Strategy 2c	Aims to reduce the length of coastline of the NYC area as much as possible. Rather than pursuing multiple barriers described in 2b, there is one barrier that connects Sandy Hook, NJ, and the tip of the Rockaways in Queens, NY. As in strategy 1c, lower sports on the inside of the protection system will be elevated.	$11.0-14.7B	$117.5M/ year

The costs for Strategy 1a are lowest because it includes only that of lowering vulnerability to buildings and not critical infrastructure. Additional protection leads to additional costs and, particularly, protective measures have tremendously high maintenance costs in comparison to flood-proofing. This constitutes solely a cost-analysis and not a more comprehensive cost-benefit analysis.

NYC is in many ways leading the way for climate change adaptation planning in the U.S. This is particularly so from a disaster management perspective. It is important to note, however, that their efforts frame disaster impacts related to more general

effects of climate change such as accelerated sea level rise. Due to geographical differences, the needs of different locations to develop local planning responses to climate change impacts will vary as well as the ability to adapt.

5. Considerations for Sea Level Rise in Environmental Review

Codiga and Wager (2011) suggest that environmental review is an appropriate regulatory tool in which to consider the impacts of accelerated sea level rise (a suggested 1-foot-by-2050 and 3-feet-by-2100 benchmark) in Hawaii. It suggests an update of Hawaii's Chapter 343 such that climate change impacts are considered. Similarly, NPCC (2010) suggests that New York State's Environmental Quality Review Act (SEQRA) and the City Environmental Quality Review (CEQR) are also well-poised to be amended to consider climate change impacts (NPCC, 2010, p. 95-97). Incorporating climate change (both adaptation and greenhouse gas emissions) within environmental review is becoming more widely considered and examples in practice are emerging. For example, the U.S. Army Corps of Engineers requires consideration of sea-level rise impacts to coastal and estuarine zones in all phases of its civil works programs (Codiga and Wager, 2011) and therefore leads to disclosure of such impacts in environmental review. Other agencies, such as the U.S. Department of Transportation, are undergoing comprehensive climate change adaptation planning (U.S. DOT, 2013).

The Center for Climate Change Law at Columbia Law School compiled a database of (NEPA-driven) Environmental Impact Statements (EIS) that address climate change. They collected 195 examples (up to the year 2011). Of them, five specifically consider sea level rise. Three of them are for the U.S. Army Corp of Engineers, one is for National Highway Traffic Safety Administration, and one is for the Bureau of Reclamation. As an example, a 2010 EIA for the U.S. Army Corp of Engineers assessed re-vegetation and restoration in Louisiana wetlands. While it is difficult to know whether this is an exhaustive sample, and determining that is outside the scope of this study, it nonetheless gives the impression that environmental review can be an appropriate tool in which to consider impacts of climate change – though its application is currently limited.

This is further evidenced by the lack of academic publication on the issue of climate change and environmental review. In one of the few peer-reviewed documents found as part of this study, Slotterback (2011) discusses emerging state-level environmental review practices for considering greenhouse gas emissions as a result of project implementation. Several states and agencies now systematically require consideration of greenhouse gases – though state environmental review laws are varied (see Slotterback, 2011, for a full discussion). No study on the systematic inclusion of climate change impacts to project outcomes is found. This is a fruitful area of future inquiry – particularly as agencies such as the U.S. Army Corp

of Engineers and a variety of municipalities continue to incorporate sea level rise into their planning practices.

It should be noted that the recently released Final Supplemental Environmental Impact Statement for the Turtle Bay Resort Expansion project on the North Shore of O`ahu addresses climate change impacts and suggests expanding coastal setbacks for development (Sichter, 2013).

6. Expected Impacts to the Kakaako Community Development District

The KCDD is bisected by Ala Moana Boulevard and its *mauka* (toward the mountain) area is bound by Piikoi Street, Punchbowl Street and King Street. On the *makai* (toward the ocean) side of Ala Moana Boulevard, the District is bound by the Ala Moana Regional Park and the property line between Pier's 2 and 4 at Honolulu Harbor. While no comprehensive vulnerability assessment exists for the KCDD, there are three existing studies and sources that suggest much of the KCDD will experience persistent flooding with a 1-meter sea level rise. The Coastal Geology Group at the School of Ocean and Earth Science and Technology at the University of Hawaii at Manoa has mapped a meter of sea level rise contour line (during high tide) in the broader Honolulu area (CGG, 2009). Much of the KCDD is within this zone; the entire *makai* area and much of the *mauka* area. The National Oceanic and Atmospheric Administration (NOAA) recently released their Sea Level Rise and Coastal Flooding Impacts Viewer (NOAA, 2013a). This maps between 1 and 6-feet of sea level rise throughout the U.S. Within Honolulu, while the map is at a relatively high level, it is possible to see the inundation of the KCDD. This is particularly evident through the region at an estimated 4-feet of sea level rise (relative to high tide). The map additionally shows that NOAA classifies the KCDD as medium-to-high in social *vulnerability.* Providing more context, a report released by the NOAA Coastal Storms Program (2013) looks at the impacts of a of 1-meter sea level rise coupled with additional flooding due to hurricane, tsunami and riverine overflow. The study covers the greater Honolulu area, from Pearl Harbor to Diamond Head. The 1-meter sea level rise is considered a baseline for analysis of storm events and thus it is not possible to isolate the mapping of 1-meter of sea level rise. However, given this has been done in previous studies, the added value is in building understanding the relationship between sea level rise and storm events. In the a rather hurricane storm surge and tsunami run-up "worst-case" scenarios, the KCDD is entirely inundated. Parts of the region would experience up to 10-feet of flooding. Within the greater Honolulu area, the study estimate that 87% of the tourism sector, 79% of construction and manufacturing activity, 75% of the health sector, and 81% of retail and wholesale activity are affected by the aggregate flooding. It is not estimated what proportion of the loss of economic activity occurs in the KCDD.

The KCDD's waterfront is generally a combination of sea walls and harbors. The two largest impacts to the KCDD as a result of accelerated sea level rise will likely

be: 1) more common and persistent flooding, and 2) coastal erosion and damage to protective structures and harbors. Flooding will likely be associated more with groundwater and seawater intrusion into the drainage system, resulting in upwelling from manhole covers, and localized flooding of certain streets (Rotzoll and Fletcher, 2012). However, in the long-term, storm surge overtopping existing seawalls may occur. Storm events will exacerbate flooding.

Persistent flooding within the KCDD will have the effect of 1) further challenging wastewater and drainage systems, and eventually rendering current systems inadequate and 2) causing damage to roads, buildings and other infrastructure (potentially subterranean utilities) not designed for flooding (with both rain and saltwater). The issue of wastewater will tax existing wastewater systems regardless of measures taken at the coast due to the interaction between the water table and storm activities. Damages to infrastructure like roads will require on-going maintenance. While the planned rail transit stations in the KCDD will be elevated, there may be impacts to connectivity with other modes of transportation.

Accelerated sea level rise will also impact existing sea walls, harbors/piers and other coastal infrastructure within the KCDD. The appropriateness of response is difficult to comment on without further analysis of existing infrastructure (like undertaken by the NPCC in NYC).

7. Recommendations and Conclusions

This study provides a review of best practices in regards to planning responses to accelerated sea level rise. The literature finds that the most vulnerable areas to accelerated sea level rise have high exposure coupled with a concentration of population and urban development. From the literature reviewed, best planning responses to accelerated sea level rise include: 1) prohibitive zoning in areas deemed vulnerable, constituting *retreat* and *avoidance*, 2) further pursuing protective measures such as improving drainage capabilities (including pumping) and hardened structures like heightening sea walls, and 3) accommodating flooding through improved building design (such as elevation). From the NYC case estimates, it seems that more "open strategies" like changes to building code have less upfront cost as well as ongoing maintenance costs, though there was little consideration to risk mitigation. The broader literature suggests that protective measures are good short to medium-term strategies, though may prove cost prohibitive in comparison to retreat in the long-run. In addition, the literature suggests it is best practice to *avoid* additional development in highly vulnerable areas. If development is allowed within the region, the development must follow best practices for resiliency to impacts such as flooding. California guidance has gone as far as to say that the buildings should be "expendable" or "moveable."

Kakaako is in a low-lying area of Honolulu, shown to be largely within the 1-meter contour line during projected high tide in the year 2100. According to the NOAA Sea Level Rise Viewer (2013), and at a relatively high level, flooding is most pervasive within the KCDD at 4-feet of sea level rise. The KCDD is an existing urban center that is being planned for urban redevelopment and densification. In terms of implications of sea level rise, planners and relevant agencies should consider several factors.

1) There is a need for a comprehensive vulnerability assessment and mitigation plan for the KCDD. This should build on current estimates of *exposure*, as well as include *sensitivity* and, *adaptive capacity*. This includes robust scenarios of future sea level rise and impacts to the KCDD. This will help to build understanding of "critical thresholds" in the impact of sea level rise to critical infrastructure and population, as well as inform risk and vulnerability in regards to new development.

2) At a minimum, information on sea level rise and vulnerability for the KCDD should be made public and widely available to developers, prospective home buyers/renters, and businesses. This would allow private developers and residents to more optimally respond to market signals in regards to risk (for example, to enhance building design). Education and outreach for the expected impacts to the KCDD are needed – particularly because no broader state level adaptation plan current exists.

3) There should be community engagement in building understanding of risk and resiliency. This is because the concept of vulnerability is somewhat relative – where it is important to understand community needs and willingness to accept risk, as well as have strong mechanisms to educate the community on expected climate change impacts. The iterative decision-making framework described by Sahin and Mohamed (2013) provides a comprehensive approach, though a more traditional scenario planning strategy can be employed.

5) There should be a study estimating the potential costs of sea level rise to the KCDD and detailed planning responses. Key considerations are the use of appropriate flood-resilient building materials and design, the upgrading of wastewater and drainage systems within the KCDD as well as road maintenance. Because Kaka`ako is an existing urban area, some of these costs would be born with or without redevelopment or densification. Costs associated with sea level rise will be distributed between state and county government, developers, residents, and taxpayers. These costs, and their distribution, must be understood to aid long-term decision-making. This study should be undertaken by an interdisciplinary team, including engineers, planners, architects and economists.

There is sound reason to adopt the sea level rise planning benchmark of 1-foot-by-2050 and 1-meter-by-2100 for Hawaii, based on the previous work of ICAP (Codiga and Wager, 2011). Moreover, there is strong evidence that much of the KCDD will experience persistent flooding by the year 2100 (CGG, 2009). Within the context of the KCDD, however, understanding the longevity of existing and new infrastructure is crucial to decision-making. Thus a study building understanding of the interaction between sea level, critical infrastructure and population is an important next step.

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Appendix C: Supplemental Cultural Impact Assessment

Pacific Legacy

Historic Preservation

SUPPLEMENTAL CULTURAL IMPACT ASSESSMENT FOR THE KAKA'AKO COMMUNITY DEVELOPMENT DISTRICT TRANSIT-ORIENTED DEVELOPMENT OVERLAY HONOLULU AND WAIKĪKĪ AHUPUA'A, KONA DISTRICT, O'AHU

TMK: Aloha Tower Special District: 2-1-014:006;
Kaka'ako: 2-1 (various parcels); 2-3 (various parcels)

Pacific Legacy: Exploring the past, informing the present, enriching the future.

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ABSTRACT

Pacific Legacy, Inc., under contract to Lee Sichter LLC, performed a Supplemental Cultural Impact Assessment (SCIA) for areas within the Kakaʻako Transit-Oriented Development (TOD) Overlay project area as described by the Proposed Action found in the project's Environmental Impact Statement Preparation Notice (EISPN) (Sichter 2012:1). The project area encompasses the Kakaʻako Community Development District (KCDD) as well as Aloha Tower Special District in the *ahupuaʻa* of Honolulu, Kona District, Island of Oʻahu, Hawaiʻi. The purpose of this SCIA is to identify cultural groups, resources, and areas of interest not addressed or not sufficiently covered by the existing record of cultural resources, which is based upon five Cultural Impact Assessments (CIA), two Ethno-Historical Inventory studies, and a Traditional Cultural Property (TCP) study that have been performed in the Kakaʻako area (UH 1978; Wilson Okamoto and Associates, Inc. 2002; McElroy et al. 2008; Spearing et al. 2008; Vogeler et al. 2010; Genz & Hammatt 2010; Elison and McElroy 2011; Maly et al. 2013). This SCIA builds upon these cultural investigations.

In general, cultural groups identified in previous cultural investigations included Native Hawaiians as well as *kamaʻāina* and cultural practitioners belonging to various ethnic groups and groups with mixed ethnicities. Practices identified consisted of a number of traditional Hawaiian activities and other activities that bind other ethnic and cultural groups together. Largely, traditional Hawaiian activities were not reported as being practiced in a traditional context. However, the reviewed CIAs demonstrate that in the distant past there was an abundance of tangible cultural resources, such as an array of fish, plants, salt, and ceremonial sites in the project area. Some of those resources are still available in a handful of locations, but far less in quantity. Further, intangible resources are still felt by Native Hawaiians who identify with the *inoa ʻāina* (Hawaiian place names) and *wahi pana* (storied places), due to the belief that *moʻolelo* (stories) and ceremonial practices have imbued the cultural landscape with the *mana* of their gods and ancestors. It is also well documented that *iwi kūpuna* (ancestral remains) and archaeological sites buried in this area are ubiquitous.

This SCIA has found that the vast area we now refer to as Kakaʻako has many cultures and sub-cultures. Kakaʻako also contains unique cultural resources, such as museums and art workshops, that attract people from all areas. While Kakaʻako has a rich and colorful past, people who live and work in Kakaʻako as well as those who travel from afar, have come to identify the area as having an evolving and multi-faceted culture. This culture features, among many, a progressive side and a side interested in preserving cultural traditions. Striking a balance between these two polar factions would support an affable cultural landscape.

A number of Kakaʻako's cultural practices and resources that were either overlooked or outside of the scope of previous CIA were identified in the course of this SCIA that occur in or adjacent to the Kakaʻako TOD Overlay project area. Cultural resources have been grouped as: Historic Places and Landmarks, Cultural Learning Facilities, Public Parks and Grounds, Memorials and Commemorations, Religious and Spiritual Gathering Places, and Public Art Installation and

Entertainment Centers. These locations function as cultural resources in a sense that community members frequent them tap into the institutional knowledge held by members of the same cultural group or sub-group who also frequent the location in addition to the resource (i.e. memorials, art, music, and food) that they identify with. Further, regular and intermittent gatherings by those united by a common tradition, practice, ideal, identity, belief, and/or memory generates an institutional knowledge within the group and serves to perpetuate their cultural practices and values. In some cases, cultural resources are not necessarily tangible in nature, but are locations that serve as repositories for various shared traditions, practices, ideals, identities, beliefs, and memories. The cultural resources identified in this study are important facets of Kakaʻako's cultural landscape, as they make Kakaʻako the contemporary cultural hub that it is today.

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Frontispiece: Kaka'ako TOD Overlay project area highlighted on Google Earth areal image.

1.0 INTRODUCTION

A Supplemental Cultural Impact Assessment (SCIA) was performed by Pacific Legacy, Inc., under contract to Lee Sichter LLC, for the Kakaʻako Transit-Oriented Development (TOD) Overlay project area as described by the Proposed Action found in the project's Environmental Impact Statement Preparation Notice (EISPN) (Sichter 2012:1). The project area encompasses the Kakaʻako Community Development District (KCDD) as well as Aloha Tower Special District in the *ahupuaʻa* of Honolulu, Kona District, Island of Oʻahu, Hawaiʻi [TMK: Aloha Tower Special District: 2-1-014:006; Kaka'ako: 2-1-015:009, 051, 052, 061-063; 2-1-029:001, 002, 010; 2-1-030:001, 003, 006-015, 017, 043; 2-1-031:001-005, 008, 010, 012, 015, 018-021, 024, 029-033; 2-1-032:001, 002, 007-012, 015, 017, 020, 022-024; 2-1-044:001-005, 022, 023, 032-034, 038-044, 046-048; 2-1-046:001-003, 005, 007-010; 2-1-047:001-006, 008, 010; 2-1-048:001, 002, 005-008, 022; 2-1-049:001, 003-005, 008-033, 037, 038, 040-043, 045-050, 054-061, 063-066, 068-076, 078-080; 2-1-050:001-004, 007, 009-025, 027, 028, 030-043, 045-050, 052-065, 067, 068; 2-1-051: 001-007, 010-014, 018, 019, 031, 033, 038, 040-044; 2-1-052:001-005, 007-013, 016, 017, 020, 022, 024, 027, 028, 031-036, 038-040, 042, 043, 045, 046, 051-054; 2-1-053:001, 030-032; 2-1-054:001, 021, 022, 025, 027, 028, 032, 033; 2-1-055:001-004, 006, 009, 017, 018, 021, 026, 032-035, 038; 2-1-056:001-004, 007, 008; 2-1-058:002, 006, 021, 035, 043, 048, 061, 069, 073, 088, 089, 094, 095, 099, 100, 101, 103, 105, 109, 124-128; 2-1-059:001, 003-006, 011, 013, 020, 021, 023-029; 2-1-060:001-009, 013, 015, 017; 2-3-001:001, 004; 2-3-002:001, 002, 057-059, 066, 067, 069, 086, 087, 104; 2-3-003:004-008, 011-015, 018-024, 026, 028, 030-034, 037, 038, 040, 043, 046-050, 052, 059, 061-069, 071, 073-075, 078, 080, 081, 083, 085-087, 089-095, 097-099, 103, 105; 2-3-004:002, 003, 007-010, 012, 025, 029, 031, 033-037, 039, 048, 051, 061, 065, 069, 071, 076, 079, 080; 2-3-005:001, 004-006, 012-017, 019, 022; 2-3-006: 001, 003, 004, 014-017; 2-3-007:023, 026-029, 033, 036, 039, 044, 045, 049, 054, 056, 057, 061-064, 066, 067, 069, 078, 091-093, 098-101, 104, 105, 107; 2-3-008:001-003; 2-3-009:001; 2-3-010:001-009, 011-028, 083, 092-094, 096-107, 111; 2-3-011:002-025, 029-051, 053, 054]. Specifically, the Kaka'`ako TOD Overlay project area consists of KCDD lands, which are comprised of 601.6 acres bounded by King Street to the north, Piʻikoi Street to the east, Ala Moana to the southeast, Māmala Bay to the south, Pier 1 to the southwest, and Punchbowl Street to the west, as well as the HECO Downtown Power Plant block comprised of 3.4 acres bounded by South Nimitz Highway to the north, Richard Street to the east, Aloha Tower Drive to the south, and Bishop Street to the west (Figure 1). This SCIA proposes to identify cultural groups, resources, and areas of interest not addressed or not sufficiently covered by existing reports.

The Proposed Action in the Kakaʻako TOD Overlay EISPN is as follows:

> The Proposed Action is the implementation of a Conceptual Plan for Transit-Oriented Development ("TOD") within the Kakaʻako Community Development District (KCDD). The proposed TOD Plan will serve as an overlay on the existing rules governing development in the district, meaning that the existing rules remain in force and any proposed TOD development will be required to comply with the proposed TOD Plan. The implementation of Transit-Oriented Development is intended to maximize development in the district by promoting the use of smart growth principles, multi-modal transportation, and walkability (Sichter 2012:1).

Figure 1. Kakaʻako TOD Overlay Project Location (Courtesy of Lee Sichter LLC).

1.1 PURPOSE

Over the last 150 years, the word "culture" has had many different meanings. For example, some people define culture as an appreciation of good literature, music, art, and food. A biologist, however, will use the term to refer to a colony of bacteria being studied. Anthropologists define culture in many ways as well, with a central definition of culture as the behavioral patterns of any group of humans that stem from learned behaviors. English Anthropologist, Edward B. Tylor, was the first to use the term in such a way in his book, *Primitive Culture* (1871). According to Tylor (1871:1), culture is "that complex whole which includes knowledge, belief, art, law, morals, custom, and any other capabilities and habits acquired by man as a member of society." Since Tylor's era, anthropology as a discipline has evolved and grown in complexity. Modern anthropologists understand that culture is constantly changing and that there can be many cultural groups within a society. Manifestations of these cultures can be seen in an array of material and non-material forms that are unique to a specific culture or sub-culture.

The term, "cultural resources" is also ambiguous in nature. Thomas F. King (2003), leader in historic preservation and federal cultural resource laws, vacillates on the definition of Cultural Resource Management (CRM) and holds that there is no agreement on the definition of CRM, but offers several stances on the definition for cultural resources by stating, "Some of us use the term broadly to refer to all elements of the physical and social environment that are thought by anybody – a community, a tribe, an interest group – to have cultural value" (King 2003:11). He later provides a counter perspective on cultural resources, which he holds is narrow and unfortunate. King states:

> Others define *cultural resources* much more narrowly – though the definition is often only implicit and not uncommonly denied. *Cultural resource* is taken by such people to mean a place that's eligible for the National Register of Historic Places or even just an archaeological site. This is unfortunate, because it makes it easy for government to ignore cultural resources that *aren't* archaeological sites or don't appeal to the keeper of the National Register and her staff and hence to allow their damage or loss without considering the feelings of those who value them (King 2003:12).

The purpose of this SCIA is to identify cultural resources and practices, in the broader sense, for areas in and around the Kakaʻako TOD Overlay project area that have not been identified by previously conducted CIAs. Due to its vast area, complex history, population density, as well as rapid land-use changes and urban sprawl, Kakaʻako currently has many cultures and sub-cultures that co-exist. There have been a series of demographic changes as well as land use changes in Kakaʻako since its initial pre-Contact settlement that have ushered in new groups and forced out others. In the last fifty years, cultural diversity in Kakaʻako has increased dramatically and is comprised of an array of ethnic groups as well as cultural groups bound by a common custom, belief, or "any other capabilities and habits," as Tylor (1871:1) states.

Native Hawaiians were the first to settle the area and, therefore, have the longest cultural history in the area. The primary focus of all previous cultural studies for Kakaʻako has been on Native Hawaiians. These assessments have provided us with a wealth of knowledge about past and present Native Hawaiian land-use of Kakaʻako, however, little attention was paid to other ethnic groups or other cultural groups. Further, no non-ethnic based cultural groups have been represented in previous studies. Many of the cultural resources identified in this study are of significant only to these "other" cultural groups and are contemporary in nature. It is important to note that cultural resources are no less important for cultural groups that exist today than those utilized by cultural groups in previous eras. Thus, efforts were made in this SCIA to include contemporary cultural resources and practices to be inclusive of all cultural groups in Kakaʻako and those that come from other areas to access these unique resources.

According to ACT 50, SLH 2000, an Environmental Impact Statement (EIS) "…should identify and address effects on Hawaiʻi's culture, and traditional and customary rights (ACT 50, SLH 2000: Section 1)." Essentially, a CIA, as a supporting document of the EIS, has the goal of promoting and protecting cultural beliefs, practices, and resources of "Native Hawaiians, other ethnic groups, and groups" (OEQC 1997:1). To date, the term "groups" has been left undefined by the 1997 Office of Environmental Quality Control (OEQC) Guidelines and Act 50, SLH 2000.

However, ACT 50, SLH 2000 goes to some length to stress the importance of this act in promoting and preserving cultural practices and resources of Native Hawaiians and other ethnic groups, stating:

> The legislature also finds that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the "aloha spirit" in Hawaii. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups (ACT 50, SLH 2000: Section 1).

Yet, as declared in Act 50, SLH 2000, the legislation has the stated purpose to:

> 1) require that environmental impact statements include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and
>
> 2) amend the definition of "significant effect" to include adverse effects on cultural practices.

The law remains unclear what defines "community and State" in terms of demographics and cultural groups or its sub-sets. "Hawaiʻi's culture"(ACT 50, SLH 2000: Section 1) and the community of Kakaʻako consists of many cultural groups, centered on common cultural values, beliefs, and interests, including (but not limited to) Native Hawaiian and other ethnic groups. Other cultural groups in the area (e.g. religious, arts, sports, political, commercial, etc.) are united as cultural groups by the special interest that they share, but rarely represent or consist of a single ethnic group. Additionally, these groups regularly commune and organize ceremonial and secular events; exhibiting various hallmarks of a distinct culture. Thus, a CIA should make every effort to include these groups and transcend the constraints of ethnicity. This document will assume "groups" include those bound by a common cultural interest, concentrating on those that are recognized as a distinct cultural group by the community.

1.2 METHODS

According to the 1997 OEQC *Guidelines for Assessing Cultural Impacts*, cultural practices and beliefs may include those relating to subsistence, commercial, residential, agricultural, access-related, recreational, as well as religion and spirituality. Further, the CIA is designed to promote and protect cultural beliefs, practices, and resources of native Hawaiians, other ethnic groups, and other groups (OEQC 1997: 3-4). To determine the effects of the proposed development on cultural practices and resources, the following tasks are undertaken:

> 1) identify and consult with individuals and organizations knowledgeable about cultural practices that may have taken place in the area;
>
> 2) conduct archival research about traditional practices that may have been conducted in the area;

3) describe the cultural practices that took place within the potentially affected area;

4) assess the impact of the proposed development on the cultural practices that may have taken place within the potentially affected area; and;

5) prepare a report on the findings resulting from the above investigations.

A copy of 1997 OEQC *Guidelines for Assessing Cultural Impacts* is provided in Appendix A.

To perform the Supplemental Cultural Impact Assessment (SCIA) a document search was conducted to identify any existing CIA performed in or around the Kakaʻako TOD Overlay project area. To do so, the Office of Environmental Quality Control (OEQC) and State Historic Preservation Division (SHPD) Library were researched to find any CIA conducted for the project area. All archaeological reports, Environmental Impact Statements (EIS), and Environmental Assessments (EA) pertaining to the general area of Kakaʻako were reviewed to determine if any CIA were conducted concordantly. A total of 5 CIAs previously conducted for the project area were identified and are as follows:

- Wilson Okamoto and Associates, Inc.
  2002 Cultural Impact Assessment in the Final Environmental Assessment University of Hawaii Health and Wellness Center. Prepared for the University of Hawaii, John A. Burns School of Medicine. Prepared by Wilson Okamoto and Associates, Inc., Honolulu.

- Spearing, Mishalla, Constance O'Hare, and Hallett H. Hammatt
  2008 Cultural Impact Assessment for the Kakaʻako Community Development District Mauka Area Plan, Waikīkī Ahupuaʻa, Honolulu (Kona) District, Oʻahu Island. TMK: [1] 2-1-29-32, 44, 46-56 and 2-3-01-11. Prepared by Cultural Surveys Hawaiʻi, Inc., Kailua

- Vogeler, Kuhio, Lehua Kauhane, and Hallet H. Hammatt
  2010 Cultural Impact Assessment for the Proposed McKinley High School Athletic Complex Master Plan Project, Honolulu (Kewalo) Ahupuaʻa, Honolulu District (Kona Moku), Island of Oʻahu. TMK: [1] 2-3-009:001 por. Prepared by Cultural Surveys Hawaiʻi, Inc., Kailua.

- Genz, Joseph H. and Hallett H. Hammatt
  2010 Cultural Impact Assessment for the Kewalo Basin Repairs Project, Kakaʻako Ahupuaʻa, Honolulu (Kona District), Oʻahu. TMK: [1] 2-1-058. Prepared by Cultural Surveys Hawaiʻi, Inc., Kailua.

- Elison, Mina and Windy K. McElroy
  2011 Final – Cultural Impact Assessment for Kakaʻako, Ahupuaʻa of Waikīkī, Kona District, Island of Oʻahu, Hawaiʻi. TMK: [1] 2-3-006:017. Prepared by Keala Pono Archaeological Consulting, LLC, Hauʻula.

In addition, two ethno-historical investigations and one Traditional Cultural Property (TCP) Study (with its Oral History – Consultation Interview Program component report) performed for areas that occur within or partially within the Kakaʻako TOD Overlay project area were reviewed, including:

- University of Hawaiʻi (UH)
  1978 *Remembering Kakaʻako: 1910-1950*. Ethnic Studies Oral History Project, Ethnic Studies Program, University of Hawaiʻi at Mānoa, Honolulu.

- McElroy, W.K., A. Sims, and M. Desilets
  2008 *Ethno-Historical Inventory Study of Kakaʻako*. Performed for Kamehameha Schools. Garcia and Associates, Kailua.

- Maly, Kepā, Onaona Pomroy Maly and Kawena Maly.
  2013 Draft He Moʻolelo ʻĀina - Traditions and Storied Places in the District Of Kona – Honolulu Region (Lands of Kalihi to Waikīkī), Island of Oʻahu. A Traditional Cultural Properties Study – Technical Report. Prepared for SRI Foundation, New Mexico.

- Elison, Mina
  2013 Oral History – Consultation Interview Program – Ahupuaʻa of Kalihi to Waikīkī, District of Kona, Island of Oʻahu. Component to Maly et al. 2013, Appendix D. A Traditional Cultural Properties Study Technical Report. Prepared by Kahiwa Cultural Heritage Consulting with Kumu Pono Associates LLC, Lanai City.

After reviewing and compiling all findings from previously conducted CIAs, ethno-historical investigations, and the Traditional Cultural Property (TCP) study (with its Oral History – Consultation Interview Program component report), protocols from the *Guidelines for Assessing Cultural Impacts* (OEQC 1997) were followed to identify cultural resources and practices not yet identified. Appendix A provides a copy of the OEQC (2013) Guidelines. The findings of these efforts are provided in this Supplemental CIA.

2.0 PROJECT AREA DESCRIPTIONS

The project area for the proposed Kakaʻako TOD Overlay encompasses the Kakaʻako Community Development District (KCDD) as well as Aloha Tower Special District in the *ahupuaʻa* of Honolulu, Kona District, Island of Oʻahu, Hawaiʻi (Figure 2). Specifically, the Kakaʻako TOD project area consists of KCDD lands, which consist of 601.6 acres bounded by King Street to the north, Piʻikoi Street to the east, Ala Moana to the southeast, Māmala Bay to the south, Pier 1 to the southwest, and Punchbowl Street to the west, as well as the HECO Downtown Power Plant block comprised of 3.4 acres bounded by South Nimitz Highway to the north, Richard Street to the east, Aloha Tower Drive to the south, and Bishop Street to the west (Figure 1).

2.1 ENVIRONMENTAL BACKGROUND

Thorough environmental descriptions of the Kakaʻako TOD Overlay project area can be found in previous CIAs performed for projects located within its boundaries (Spearing et al. 2008; Vogeler et al. 2010; Genz & Hammatt 2010; Elison and McElroy 2011).

The Kakaʻako TOD Overlay project area is located on the leeward side of the Koʻolau Range on the south coast of Oʻahu between Waikīkī and Honolulu. In general, environmental conditions of Kakaʻako are relatively mild. The general geological provenience on which most of Kakaʻako is situated is referred to as the Honolulu Plain, excluding the *makai* portions built up with fill in the Historic era. Prior to development, much of Kakaʻako had a low marshy topography.

The area's geomorphology is a result of volcanism attributed to the now extinct Koʻolau Volcano, which built the island mass, followed by coastal erosion and deposition related to the Pleistocene Epoch's glacial and inter-glacial sea level fluctuations. The coastal of Kakaʻako consists of an elevated coralline reef that was formed during an interglacial period approximately from 120,000 to 38,000 years ago, when sea levels in Hawaiʻi were some 6-8m above the present sea level, which has been termed the Waimānalo Sea Stand. During this period, coral reefs developed upwards with the gradually rising sea levels. During the next period of glaciation, sea levels dropped leaving exposed coral reefs that were then eroded by marine level fluctuation, wave/sediment abrasion, as well as weathering by rain, run-off, and wind after sea levels dropped to their present level. Further, rain water naturally absorbs carbon dioxide in the air to form a weak carbonic acid, which dissolves portions of the limestone with prolonged exposure, subsequently forming karst topography. Hallmark features of karst topography are caverns and sinkholes, which are formed as acids build up and dissolve soluble portions and natural voids in the limestone (Foote et al. 1972; MacDonald & Abbott 1970; Geolabs 2004).

Typical subsurface conditions in Kakaʻako are a composite of Pleistocene coral and algal reef deposits mixed with terrigenous sediments or *mauka* soils (Geolabs, Inc. 2004). According to the Natural Resources Conservation Service (NCRS) Custom Soil Resource Report for the contiguous, Kakaʻako Makai and Mauka portions of the project area are 66% mixed fill land (FL), 23.5% Makiki clay loam (MkA) with 0-2% slopes, and 4.1% Ewa silty clay loam (EmA), moderately shallow, with 0-2% slopes (NCRS 2013a). The HECO Downtown Power Plant block

is 100% mixed fill land (FL) (NCRS 2013b). Appendix B provides copies of the 2013 NCRS Custom Soil Resource Reports for the Kakaʻako TOD Overlay contiguous and non-contiguous project areas. Fill lands consist mainly of sediment dredged from the ocean and/or hauled in from other areas of the island (Foote et al. 1972). However, Kakaʻako Waterfront Park fill is primarily non-combustible Historic refuse (Wilson Okamoto and Associates, Inc. 2002).

The area receives less than 76 cm of precipitation annually, falling mainly between November and March. The mean air temperatures of Kakaʻako range from lows of 15°-21°C (51°-91.4°F) to highs of 27°-28°C (80.6°-82.4F), with the coolest months being January through March and hottest from July to October (Armstrong 1983:62).

The state of the project area is fully developed and currently functions as an urban and industrial cityscape (Figure 2).

Figure 2. Current state of the Kakaʻako TOD Overlay project area (courtesy of Google Earth).

3.0 CULTURAL LANDSCAPE SUMMARY

The land to which we now refer to as Kakaʻako has a long and rich cultural history. From Traditional Hawaiian accounts, *moʻolelo*, Historical documents, and the archaeological record it is evident that this locale has been the backdrop to many significant acts in the long drama of Oʻahu's pre- and post-Contact history. Thorough archival research was performed by Spearing et al. (2008), Vogeler et al. (2010), Hammatt and Shideler (2010), Elison and McElroy (2011), and Maly et al. (2013) to describe the cultural landscape of pre-Contact to present day Kakaʻako.

3.1 PRE-EUROPEAN CONTACT CULTURAL LANDSCAPE

Kakaʻako's current boundaries, in the Kakaʻako TOD Overlay project's configuration, appear to be a modern construct with no evidence of distinct Traditional or Historic boundaries to affirm them (Spearing et al. 2008; Vogeler et al. 2010; Elison and McElroy 2011). Rather, Kakaʻako is composed of component *inoa ʻāina* (Traditional Hawaiian localities), including Kakaʻako, Honokaʻupu, Kaʻākaukukui, Kukuluāeʻo, Kālia, Kewalo, Kou, Kuloloia, Māmala, and Pākākā, that were situated between the two major population centers, Kou (now Honolulu) and Waikīkī.

3.1.1 The Natural World

The mundane, or lifeways and land use, of pre-European contact Hawaiians are integral components of the cultural landscape and are interpreted through archaeological research in conjunction with oral histories and recorded traditional accounts. Handy and Handy (1991) provide some commentary on general land use patterns of ancient Hawaiians that are applicable to the general Kakaʻako area. As marine resources represent the main source of protein in the traditional Hawaiian diet, Handy and Handy (ibid.) suggest that upland agriculture was typically preceded by or correlated with the productiveness of an area's coastal fishing grounds. *Mauka* lands were intensively developed in areas where coastal fishing grounds were easily accessed. On Oʻahu, sweet potatoes were cultivated to supplement taro, the main starch of the Hawaiian diet, when soils were too sandy or dry to grow taro. Further, sweet potato cultivation, typically grown inland, appeared to correlate with high population densities in general.

Traditionally in Hawaiʻi, environmental zones were perceived and determined by various natural features and resource criteria (Handy and Handy 1991:54-56). The following describes the general terrestrial environmental zones:

1. *Ko Kaha Kai*: Land by the sea, or coastal region providing marine resources (fish and other marine animals, seaweed and salt). "Kaha was a special term applied to areas facing the shore but not favorable for planting."
2. *Kula*: The plains or sloping lands (without trees) above the coastal region.
   a) *Kula kai*: Seaward plains.
   b) *Kula uka*: Inland or upland slopes (towards the mountains).
3. *Kahawai*: The place (having) water. The area beyond or intersecting the *kula* lands. This upland zone provided suitable agricultural sites and abundant naturally occurring resources which were used for religious, domestic, and economic purposes.
4. *Wao*: Wilderness
   a) *Wao kanaka*: Region of man. Lower forest, providing hard wood (*koa*) for spears, utensils, and logs for canoes; *lau hala* (pandanus leaves) for thatch and mats; *māmaki* for bark cloth (tapa); *kukui* (candlenut) for oil; wild yams, roots, and sandalwood.
   b) *Wao akua*: Region of deities. …remote, awesome, seldom penetrated, source of supernatural influences, both evil and beneficent.
   c) *Wao maʻukele*: Rain forest. Here grew giant trees and tree ferns (*ʻamaʻu*) under almost perpetual cloud and rain.

The lands now known as Kakaʻako are located in the environmental zones of *Ko Kaha Kai* and *Kula Kai*.

Traditionally in ancient Hawaiian culture, marine zones were also distinguished by various natural features and resource criteria. The following describes the marine environmental zones (Handy and Handy 1991:56-57):

1. Neritic zone: Near-shore waters, extending from the upper reaches of the tidal edge to about 200m in depth. Contains the most resources for human use. (Midden remains from Hawaiian sites show a preponderance of species from neritic habitats [Clark 1986:34]). Corresponding to the Hawaiian marine habitats of:
   a) *Kai puʻe one*: (heaps [of] sand) the sandy edge of the sea, inshore dunes, or outer sand bar;
   b) *Kai poʻi*: (sea-breaking) out to where the wave breaks;
   c) *Kai kohola*: the lagoon, the shallow sea inside the reef;
   d) *Kai pualena*: the yellowish sea, where the streams flow in and roil the waters;
   e) *Kai ʻele*: the dark sea; and
   f) *Kai uli*: the deep blue-sea.

2. Pelagic zone: the open ocean, waters lying beyond or exceeding the depth of 200 meters.
   a) *Kai-pōpolohua-mea-a-Kāne*: the far reaches of the open sea

Marine environments were subject to the traditional resource management system as well, supported by the *kapu* (religious law) system in ancient Hawaiʻi, which preserved *lōkahi* (balance) on many levels between humans and these resources. Various marine resources were key to pre-Contact era Hawaiian life. *Iʻa* (fish), *he iʻa mea iwi mawaho* (shellfish), *heʻe* (octopus), *limu* (seaweed), *paʻakai* (salt), *ʻākoʻakoʻa* (coral), *pōhaku* (stones), *manu* (bird), and *honu* (turtle). These resources were used for sustenance, tool making, medicine, trade, architecture, and ceremony. *Paʻakai* was one of the most important marine resource for its many applications, including food preservation, seasoning, medicine, and ceremonial use (Brigham 1908; Westervelt 1915; Malo 1951:132).

3.1.2 Traditional Hawaiian Land Divisions

The pre-Contact economy of the Hawaiian Islands was based upon agricultural production that worked within a tiered system of land divisions (Lyons 1875; Malo 1951; Handy and Handy 1991; Kirch 1985; AKAC 2010). In 1875, Curtis J. Lyons, the distinguished surveyor published an article in *The Islander* on land issues, which identified the *ahupuaʻa* as the principal subdivision in a *moku*. In this article, he states:

> ...Its name is derived from the *Ahu* or altar; (literally, pile, *kuahu* being the specific term for altar) which was erected at the point where the boundary of the land was intersected by the main road, *alaloa,* which circumferenced each of the islands. Upon this altar at the annual progress of the *akua makahiki* (year god) was deposited the tax paid by the land whose boundary it marked, and also an image of a hog, *puaa,* carved out of kukui wood and stained with red ochre. How long this was left on the altar, I do not know, but from this came the name, *ahupuaʻa,* of the pile of stones, which title was also given to the division of land marked thereby… (Lyons 1875:103-104).

The islands are divided into several sections called *moku* (districts), in which are particular subdivisions referred to as *ʻokana* (a portion) or *kalana* (a division) (Lyons 1868:67-68; Malo 1951:16-17). According to Curtis J. Lyons (1868) in *Nūpepa Kuakoa*, these units are further divided into *ahupuaʻa*, which are the main units of traditional Hawaiian land division. Within *ahupuaʻa* are *ʻili*, followed by *ʻili paʻa, ʻili kūpono, ʻili lele, lele, moʻo, moʻo ʻāina, paukū, kīhāpai, kōʻele,* and *kuleana* (Pukui and Elbert 1986). However, in some cases, the *ʻili kūpono* or *kū* were a type of sovereign *ʻili* within an *ahupuaʻa* that were not made to pay tribute to the chief (Thrum 1890:106). Within the *paukū* are dry land patches, referred to as *kōʻele*, *hakuone*, and *kuakua* (cultivated specifically for the chief; listed from smallest to largest). In general, high elevations or mountains are called *mauna,* but mountains or mountain summits located centrally on the island are termed *kuahiwi*, while the peaks or ridges on top of the *kuahiwi* are called *kualono*. In 1868, Lyons continues to describe the geography of the typical *ahupuaʻa* as well as the Hawaiian names for these geological features, stating:

> The place where trees are small below the fern belt is termed kuahea (hillock section); below it is the wao (wild place), also called waonahele (wilderness) and wao eiwa (ninth wilderness). The place where trees grew taller below the wao eiwa is the wao maukele, and a little below it again is the waoakua (spirit region); next below that is where voices increase and, hence, called wao kanaka (people's sphere), because there the people cultivate food. Below that is apaa, and next is ilima (where this plant of the Sida genus is found), and below it is pahu (stake or land mark). Below pahu is kula (open country) adjoining habitations, and seaward of the village is the shore, where it joins the sea. Such was the island divisions by the ancient people of Hawaii.
>
> …Places that stand high up in this and that locality are called puu (mounds or peaks) ; if they stand in a row they are a lalani puu, or pae puu (a line or range of peaks or hills)…High places of the earth lying narrow is a lapa (ridge), or kua lapa (shoulder ridge). If the ridges are many they are called olapalapa (rough protuberances). Deep places lying lengthwise are called kahawai, awawa, or owawa (streams, valleys or ditches). Lengthy, solitary places are called alanui (roads), and kuamoo (paths), and if it continues circuiting the island it is a highway. In places where the path is steep it is called piina or hoopiina (ascending path), kooku (hill slope), and auku (up hill road). Descending paths are termed ihona, alu, kalua, and hooihona, and the place where men would rest is oioina (a resting place). Places where water flows continually are streams (kahawai). Inland places are kumu (source) and seaward places are called nuku (point or outlet). Where water is led to places of cultivation, that is called an auwai (watercourse) ; where the water joins the sea is a muliwai (river) ; waters borne within the land are lokos (lakes or ponds) (C.J. Lyons 1868 as cited in Thrum 1921:67-68).

Perhaps the ancient Hawaiians created names for an array of topographical features and slight variations within the *ahupuaʻa* as a way to help keep the dynamic *mauka-makai* economic structure organized.

With great variations of geological features, each *ahupuaʻa* had its own dynamic resource management system that was based on traditional customs upheld by the *kapu* system, or ancient religious law. The *ahupuaʻa* typically extended form the coast to the nearest mountain top or ridge and resources from the land and sea were equally distributed within the *ahupuaʻa*. Lyons (1875) describes the geographic nature of the *ahupuaʻa* as well as the movement of resources from mountain to sea and vice versa, stating:

> The Ahupuaa ran from the sea to the mountain, theoretically. That is to say the central idea of the Hawaiian division of land was emphatically central, or rather radial. Hawaiian life vibrated from *uka,* mountain, whence came wood, kapa, for clothing, olona, for fish line, ti-leaf for wrapping paper, *ie* for rattan lashing, wild birds for food, to the *kai,* sea, whence came *ia*, fish, and all connected therewith. Mauka and makai therefore fundamental ideas to the native of an island (Lyons 1875: 104).

The *ahupuaʻa* was also an important socio-political unit in the pre-Contact era, each unit with its own hierarchy. Kirch (1985) holds that *moku* were independent chiefdoms, divided into a number of radial land divisions, referred to as *ahupuaʻa,* with subdivisions of *ʻili* and *moʻo* within. According to Kirch (1985),

> Each ahupuaʻa was controlled by a lesser chief, who in turn appointed one or more stewards to oversee production, organize work parties, collect tribute, and in other ways represent the chief. Ahupuaʻa were economically self-sufficient to some degree, although differences in the local resource base (agricultural land, water resources, stone for tools, and so on) resulted in differences in the production patterns of individual land sections. Within the ahupuaʻa, there were yet smaller sections and divisions, especially the ʻili and moʻo, which were held and worked by extended households or groups of commoners (Kirch 1985:2).

According to Handy and Handy (1991), for the purpose of taxation, the chief political subdivision of the pre-Contact era was the *ahupuaʻa,* which was generally under the management of the *konohiki* (steward or caretaker). The term *ahupuaʻa* itself is derived from the fact that each coastal *ahupuaʻa* boundary was marked with an altar (*ahu*) which held a carved

wooden effigy of a pig (*pua'a*) head during the Makahiki festival, when harvest tributes (taxes) were offered to the god of rain. Handy and Handy (1991) refer to the lower chief who represented the *ahupua'a as ali'i 'ai ahupua'a,* which translates to English as "chief who eats the ahupua'a" (1991:48). Yet, according to Malo (1951:142) the *konohiki* was tasked with collecting levies from the *maka'āinana* (commoners; literally "people that attend the land") of the *ahupua'a* for the king and of the *ali'i 'ai ahupua'a*. The word *konohiki* is defined by Pukui and Elbert as the, "Headman of an ahupua'a land division under the chief; land or fishing rights under control of the konohiki; such rights are sometimes called konohiki rights" (Pukui and Elbert 1986:166). Thrum wrote that the *konohiki* was a local representative or steward of the landlord owner whose privileges and duties were, "…practically those which go with that position in any land and in common with his brethren today in Russia or Ireland he had his failings and was not always popular among his fellows…" (Thrum 1924:60).

Handy and Handy liken the *ahupua'a* tenure system to western share cropping, where "sharing between the chief and tenant was comprehensive and reciprocal in benefits" (Thrum 1991:48). Kirch and Sahlins (1992:17) delve further into the social dynamics of the *ahupua'a* in their historical ethnography, *Anahulu: The Anthropology of History in the Kingdom of Hawaii, Volume One*. Kirch and Sahlins state the following about variations in land use in the ancient *ahupua'a*:

> Economically more highly valued, the coastal areas were also generally preferred for chiefly residence. Here were the most extensive wet taro lands, offshore and onshore fish ponds, as well as access to the sea and the fishing and surfing that in Hawaii were sports of kings. Still, the uplands were also necessary for the Hawaiian existence. In addition, to things mentioned by Lyons, people were specifically dependent on the uplands for the timber and thatching of their houses; the materials for their canoes, bowls, weapons, images, agricultural tools, and other objects using hardwoods; rope, line, fishnetting; lighting (form candlenuts); pasture for domestic animals (in the nineteenth century); various fruit trees; and more (Kirch and Sahlins 1992:19).

Thus, resources needed for daily life were best grown in or collected from the habitats that they were best suited for and likely distributed, through trade, gifting, or taxes, from *mauka* to *makai* or vice versa within the *ahupua'a*.

The original configuration of Kaka'ako's traditional boundaries is unclear, though the area that is widely held as Kaka'ako appears to have grown and morphed significantly since the early European Contact period. Spearing et al. (2008:12) cite the ethnographer and long-time resident of O'ahu, Henry Kekahuna (1958:4), who placed the boundary for Kaka'ako "on the Ewa side of Kuloloia Stream where the Honolulu Iron Works and Fort Armstrong are now," an area now covered by One Waterfront Plaza (between South and Punchbowl Streets). Further, Historic maps (Bishop 1884; Monsarrat 1897; Lyons 1872) show Kaka'ako in a variety of configurations if they show the locality at all. Mid 19th century documents and maps describe Kaka'ako as a small *'ili* located in the *ahupua'a* of Honolulu (Spearing et al 2008:12).

3.1.3 *Inoa 'āina* (Hawaiian Names for Localities) & *Wahi Pana* (Storied Places)

The area now referred to as Kaka'ako has a long and colorful past. Many *inoa 'āina* within Kaka'ako were derived from legendary people and events. Some locations have been the back

drop of *mo'olelo* and are, thus, *wahi pana*. In the modern era, these *inoa 'āina* and *wahi pana* are not always used as place names for the areas that they once described. Westervelt (1915) offers very comprehensive explanations for these ancient place names in *Legendary Places in Honolulu* as does Spearing et al. (2008) and Maly et al. (2013). Figure 3 is a map of the approximate locations of *inoa 'āina* and *wahi pana* in Kaka'ako, which is based upon written descriptions and maps created by The SRI Foundation (2013:Appendix E-1 through E-4).

'Āina Hou
The land stretching from Pākākā to Kaka'ako (lower Fort Street to Kewalo Basin) on the east side of the harbor was referred to as 'Āina Hou, according to Kamakau (1961:419).

'Āpua
The place name translates as "woven fish basket," which is shared with its namesake who was a fisherman from the area between Richards, Queen, and Punchbowl Streets (Maly et al. 2013). This location is mentioned in Thrum's (1900) version of the legend of Kū'ula as an area that his son, Aiai stayed while on his journey in O'ahu and was the home of his companion Apua, who shares the name.

'Auwaiolimu
The name 'Auwaiolimu translates as "water channel of algae or mossy stream" and was the name of the area between the coastal lands of Waikahalulu and Honuakaha, which is now near Hale Kauwila and Queen streets (Maly et al. 2013).

Awalua
Ancient surf break, also called Kaawalua located in the Māmala Channel (Ī'ī 1959:82).

Hale Kauwila
Hale Kauwila, which means "house made of *kauwila* wood," is a Historic era name of the area that connects Pākākā and the old Fort. The name actually referred to one of the large thatched structures near the shore of Kuloloia, which was built for the *ali'i* Maly et al. (2013). Hale Kauwila is the location where the King and his officials met and made decisions for the Hawaiian Government.

Hale o Lono
According to Ī'ī (1959), Hale o Lono was a *heiau* that at one point had been the residence of Liholiho (Kamehameha II). Maly et al. (2013:30) states that Hale o Lono once stood near the corner of Fort and Queen Streets.

Honoka'upu
The ancient locality of Honoka'upu, which means "Albatross Bay," is named after Chief Honoka'upu. It is mentioned in Ī'ī (1959:91), where he describes it as a bathing pool or spring located "…above Queen Street, north of a pier at the corner where Queen and Alakea Streets now meet..." and states that this property, belonging to Kaiwikokoole, was located near to King Kamehameha's son, Kekuaiwa. To the east of Kou was a bond surrounded by a grove of coconut trees that was named after Chief Honoka'upu (Westervelt 1915). Ī'ī (1991:161) later writes that Honoka'upu is Kekauluohi's coral stone house located at Pohukaina, which is said

by Pukui et al. (1974:187) to have been located behind the Hawai'i State Library. The *Saturday Press Dictionary of Hawaiian Localities* (September 22, 1883:5), stating "Honokaupu Land in Honolulu on Queen Street, and between Fort and Alakea Street" (as cited by Maly et al. 2013:51). Westervelt (1915:4) holds that Honoka'upu was noted as a court for playing *ulu maika.* Further, the *mele* for Chiefess Mamala, who was the wife of Chief Honoka'upu, mentions Honoka'upu as being the location of a small *kōnane* board (Westervelt 1915:52-54). Maly et al. (2013:108) describes Honoka'upu as a being a trail junction as well.

Honolulu

Honolulu, which means "calm/peaceful cove" is the location once referred to as Kou (Maly et al. 2013) is the name of the *ahupua'a* that contains much of Kaka'ako. Westervelt (1915) offers a description of the original location of Honolulu:

> "Honolulu" was probably a name given to a very rich district of farm land near what is now known as the junction of Liliha and School Streets, because its chief was Honolulu one of the high chiefs of the time of Kakuhihewa according to the legends. Kamakau, the Hawaiian historian, describes this farm district thus "Honolulu was a small district, a pleasant land looking toward the west, - a fat land, with flowing streams and springs of water, abundant water for taro patches. Mists resting inland breathed softly on the flowers of the hala tree."
>
> Kakuhihewa was a king of Oahu in the long, long ago, and was so noted that for centuries the island Oahu has been named after him "The Oahu of Kakuhihewa." He divided the island among his favorite chiefs and officers, who gave their names to the places received by them from the king. Thus what is now known as Honolulu was until the time of Kamehameha I., about the year 1800, almost always mentioned as "Kou," after the chief Kou who was an "Ilamuku," or "Marshal," under the king Kakuhihewa. "Kou" appears to have been a small district, or, rather, a chief's group of houses and grounds, loosely defined as lying between Hotel Street and the sea and between Nuuanu Avenue and Alakea Street (Westervelt 1915:1-2).

Kamakau (1961) mentions the place name of "Honolulu" as being used during the time of Alapa'i:

> Then Alapa'i determined to sail to Oahu and take possession of that island; for he had heard that it was without a ruling chief, Pele-io-holani being at that time ruling chief of Kauai. Alapa'i therefore sailed to Oahu with his chiefs and fighting men, accompanied by the chiefs of Molokai. Inquiring about the harbors on Oahu, he was told by those skilled in such things that, "Waikiki has a harbor, Wai'alae has a harbor; these are both good harbors; at Waikiki and Honolulu live most of the chiefs" (Kamakau 1961:71).

This statement of Alapa'i also mentions that most of O'ahu's chiefs dwelt in Honolulu. Further, Kamakau (1961:82) refers to the war between Kahekili and Kahahana in 1782 as the "battle of Honolulu." He later writes of Kou as being a harbor of Honolulu in the early Contact period, stating: "But during the early days of the war a couple of foreign ships entered the harbor of Kou at Honolulu, the first to enter that harbor" (Kamakau 1961:168).

Honuakaha

Honuakaha, which means "marked earth or coastal land," is an area bound by Queen and Punchbowl Streets (Maly et al. 2013). Although, Thrum (1922:633) translates it as "flat land." This area was the location of a royal coconut grove and the former residence of Chief Kinau, father of Miriam Kekauonohi. Spearing et al. (2008) cites a legal suit over a *lele* of the Ili of Kaalaa at Honuakaha that consisted of 1.6 acres that were formerly fishpond and dry land (Hawaii Reports 1903:321, 324 as cited by Spearing et al. 2008:40).

Ho'okūkū

The area referred to as Ho'okūkū, which was between Honuakaha and Honoka'upu, is where a healing heiau and home of Liholiho once stood. Queen Street now runs through the area (Maly et al. (2013).

Hu'ehu'e

The name translates as "overflowing" and represents an area that is bounded by Queen Street and Honoka'upu (Maly et al. 2013).

Ka'ākaukukui

Ka'ākaukukui was once a reef that has been covered with fill. The name translates as "the right (or north) light," referring to a navigation landmark for seafarers (Spearing et al. 2008). Kekahuna (1958:4) states that Ka'ākaukukui was "a beautiful sand beach and reef that formerly extended a quarter mile along Ala Moana Park to Kewalo Basin. Other translations of Ka'ākaukukui consist of "radiating place for lamp" (Thrum 1922:635) and "to the right of the lighthouse" (Gessler 1937:187), as the 1869 Honolulu Lighthouse, no longer standing, was east of this location. Ka'ākaukukui was a "jump land" or *lele*, which is a non-contiguous portion of land belonging to an *'ili*. One lot of the *lele* was located on the coast and the other two were inland (Spearing et al. 2008:15-16).

Maly et al. (2013:32) translates Ka'ākaukukui as "The north/right light," and describes it as a coastal land "east of Waikahahulu, and adjoining Kukulu'āe'o." Further, Maly et al. (2013:32) holds that the area, once fronted by fishponds and salt works, was cited in historical accounts, Māhele Claims 6236, 7712, 7713 and 10605, and Register Map numbers 241, 395, 611, 861, 900, 1090, and 1471.

Spearing et al. (2008) found that Ka'ākaukukui was briefly mentioned in the Hi'iaka legends, where Hi'iaka and her companions decided to travel from Pu'uloa (Pearl Harbor) to Waikīkī by canoe after traveling around O'ahu by trail. While in Pu'uloa, Hi'iaka met a party who were en route to visit the chiefess Pele'ula in Waikīkī by land trail. Hi'iaka informed people that she would travel by sea and meet them in Kou. The chant Hi'iaka recited is as follows:

And what of me, O Honoka'upu, my love	*A pehea lāau, e Honoka'upu, ku'u aloha*
Upon the crest of the surf at Uhi and 'Oā	*I ka welelau nalu kai o Uhi, o 'Ōa*
Eyes in the living realm (night) of oblivion	*'O nā makai ke ao (pō) o poina*
Where am I, O my love	*Ma hea lā wau, e ke aloha lā*
Kou is the coral flat	*'O Kou ka papa*

Kaʻākaukukui is the pool	*ʻO Kaʻākaukukui ka loko*
Some ʻalamihi indeed	*ʻO ka ʻalamihi aʻe nō*
Wait all day until night	*ʻO ka lā pō iho*
Friends shall meet in Kou.	*Hui aku i Kou nā maka.*

(Hoʻoulumāhiehie 2006a:277; Hoʻoulumāhiehie 2006b:297)

Kaheiki

Kaheki, which means "little flow," is described as a *heiau* of *poʻokanaka* (human sacrifice) class, according to Maly et al. (2013:33) as well as the name of a land area and stream, however, the location is only noted as Honolulu. In "The Career of Boki," Kamakau (1961) describes a large boulder in Kaheiki Stream named Hōʻeu, which was the guardian of Keheiki:

> Boki started to work at the makai road leading to Kaʻalaʻa and when he reached the stream of Kaheiki there stood a great rock over the stream blocking the way. Boki was trying to remove it when a man came forward and said, "Hear, O chief! leave that rock alone. The god made this rock a guardian for this place and his house is yonder (pointing upward to Kaheiki). It is a guardian for the house of the god and its name is Hoʻeu. The nature of this rock is that if you move it aside it will make you move to a foreign land and you will no longer live in Hawaii. Lucky for you if a year passes before you depart." Boki's pipe lighters, Hohopa and Hukiki, reproved the man, to whom he answered, "Take care lest you be thrown onto a bed of thistles!" While working on the Luakaha road Boki found a long, pointed rock in his way and was starting to remove it when a divining kahuna named Luʻau who was skilled in pointing out locations came forward and said to him, "Do not disturb this rock; it is named Ku-of-exceeding-great-mana (Ku-manamana) and Rock-of-exceeding-great-mana (Pohaku-manamana). Not even a high chief should disturb that rock, for it covers the waters of Ka-papa-i-kawa-luna which lie below it and supply the waters of Kunawai, Kahoa-kane, Koʻula, and Kewalo." Boki instantly ordered the men to remove the rock, but it extended into the soil so far that when they had dug some ten fathoms down and about the same distance either way, he gave up in despair. Luʻau also showed him Kukui-puka and other kupua objects mauka of this place (Kamakau 1961:292).

In addition, Kamakau (1961:136) tells of a battle between Kahekili and Kahahana in 1783 that was fought at Kaheiki, where the "waters of the stream of Kahe-iki ran red with blood from the heaps of broken corpses that fell into the water; the stream was dammed back with the corpses of those who died in battle."

Kaholoakeāhole

The translation of Kaholoakeāhole is "the running/schooling of the āhole fish," according to Maly et al. (2013:33) and is the "point along the shoreline below Kākāʻako, near where fishermen resided in the time of Kamehameha I."

Kahuananaula

According to Maly et al. (2013:33), Kahuananaula is the traditional place name of the area "situated between King and Merchant Streets, and bounded between Fort and Alakea Streets."

Kaimukanaka or Umukanaka

Kaimukanaka translates as "the human oven" and is the name of an area and pond in Kaʻākaukukui (Spearing et al. 2008; Maly et al. 2013). The pond is said to be referred to as Kaimukanaka, Umukanaka, or Ka-imu-hai kanaka, all of which appear to be associated with human sacrifice.

Kakaʻako

Kakaʻako, which means "to strike and gather," is described as a land area situated between Honuakaha and Kaholoakeāhole that contained a fishing village in the pre-Contact era (Maly et al. 2013). There is no meaning given for the place name Kakaʻako in *Place Names of Hawaiʻi* (Pukui et al. 1974). However, Pukui and Elbert (1986:110) provide a translation for the word *kākāʻāko* as "dull, slow." Alternatively, Thrum (1922:639) suggests *kākāʻāko* means to "prepare the thatching," based on the meaning of the name's first half, *kākā*, "to chop, beat, or thresh" and its last half, *ako,* which means "thatch." Spearing et al. (2008) speculate that the name could tie into the fact that tall *pili* grass, used to thatch traditional structures, thrived in salt marshes, such as those in Kakaʻako - provided that Thrum's translation is correct.

In Thrum's (1900:123-128) version of the legend of Kūʻula, Kakaʻako is mentioned as the location that Aiai, son of Kūʻula, stayed for several days and was befriended by a local named Apua.

Kālia

The name Kālia translates as "waited for," and is a coastal *ʻili* of Waikīkī Ahupuaʻa, once famous for its salt production and fishponds (Maly et al. 2013). This location was also mentioned in Thrum's (1900) version of the legend of Kūʻula as the location where Aiai first came to on the island of Oʻahu from Molokaʻi.

Several proverbs were found regarding Kālia:

> *He kai hului ko Kālia.*
> A sea for fishing with a drawnet is the sea of Kālia.
> (Pukui 1983:71)

This proverb suggests, according to Pukui (1983:71) that the water at Kālia is very shallow.

> *Ke kai wawalo leo leʻa o Kālia.*
> The pleasing, echoing sea of Kālia.

Pukui (1083) places the sea of Kālia as the current location of Ala Moana (Pukui 1983:186).

Kaʻoaʻopa

According to Maly et al. (2013:36), Kaʻoaʻopa is a section of coastal land situated between Mokuʻaikaua and Honuakaha. The trail from Kou to Waikīkī ran through this location. Kaʻoaʻopa is also the location where the attendants of Kamehameha II (Liholiho) lived during the reign of Kamehameha I (Maly et al. 2013).

Kauanonoʻula
Roughly located at the intersection of Merchant and Alakea Streets, Kauanonoʻula is said to have been a regular haunt for ghosts. Westervelt (1915:4) holds that Kauanonoʻula, or "rain with the red rainbow," was a place where *wailua* (ghosts) were known to gather "for nightly games and sports." . Kamakau (1961) holds that Kauanonoʻula is named for an ancient chiefess, and wife of Honokaʻupu. Kauanonoʻula, translated by Maly et al. (2013:128) as "the red glowing rain" and provides a background story for the name from an article in the *Nūpepa Kuokoa*, "*Kuu Kamaaina i ka ua Kukala Hale*" (January 24, 1919:3). The story is as follows:

> It is because of a beautiful chiefess that this place is named Kauanonoʻula. It was there that she and her family resided. This is the chiefess who took Honokaʻupu as her chiefly husband, and it was at this place that they played their favorite game of kōnane. This is why the famous saying came about, "Huhuhui aku nā maka i Kou" (The eyes will meet at Kou) and "Hāhā pōele ka pāpaʻi o Honolulu" (The crabs of Honolulu grope about in the dark).
>
> Here is the tradition: It is said that the kōnane playing area of the chiefs was there by Fort Street, close to Queen Street, where the bank of Spreckles is; and at this place many people, attractive men and women, gathered for these pleasurable kōnane games of the chiefs.
>
> The kōnane board of this story was made from a large kou tree that was taken from a place nearby what is now Kapiolani Park in Waikīkī. And on the board, were marked lines and four corners in which the various pieces were set.
>
> It was in those days that the name, Kou was given to that place, because of the pastime of the chiefs, and the murmuring voices of the sweethearts could be heard about, "Huhuhui aku na makai Kou," that is the saying was spoken there [sic], inviting the desire of those who were entwined in the embrace of love to meet. Auwe!
>
> As night set out its cover, the men and women would begin to ask and seek out their companions and the saying was uttered "Hāhā pōele ka pāpaʻi o Honolulu," [sic] Thus the night was not without the groping hands - So that which was seen is finished (translated by Maly et al. 2013:128).

This story describes the general tone of this location during *kōnane* games as being a party-like atmosphere.

Kawaiahaʻo
The area in which Kawaiahaʻo Church is located was once the location of a fresh water spring that belonged to a chief named Hao, hence the name Kawaiahaʻo, which translates to English as "The water belonging to Hao," according to Westervelt (1915:3). Pukui et al. (1974) describes Kawaiahaʻo as an *ili* land once noted for its spring and healing waters. Haʻo is mentioned as both a chief and chiefess in accounts for the area (Maly et al. 2013). Kawaiahaʻo is cited in traditional and historical accounts; Māhele Claim 10605, and Register Map No.'s 111 and 900, and 1912 map by Baldwin & Alexander (SRI Foundation 2013:B-8).

Pukui (1988) recaps a *mo olelo* of the Waters of Haʻo, which describes two springs in Kewalo. In this story, two of chief Haʻo's children ran away from their malicious stepmother and hid for a time at Kewalo Spring. This spring is thought to have been near the trail that connected Waikīkī and Kou. When the children heard that the chiefess had sent men to look for them, the children took the trail across the plain to Kou that night, but succumbed to exhaustion and dehydration. At the western end of the trail, near Kawaiahaʻo Church in Kakaʻako is where the children stopped to rest. One of the children had a dream while he slept, where the boy's mother told him to pull up a plant near his feet. After pulling up the plant, a spring was found. This spring came to be known as the Water of Haʻo, or Kawaiahaʻo, after the children's father (Pukui 1988:87-89).

Ke-kai-o-Mamala
Ke-kai-o-Mamala was the name of a surf break at the outer entrance of the harbor of Kou, which was named after the chiefess Mamala. Westervelt (1915:2) describes the chiefess as a remarkable woman "who loved to play konane Hawaiian checkers drink awa and ride the surf."

Kekaukukui
Several Historic maps exhibit a location referred to as Kekaukukui, which is said to have been close to Ulakua (Westervelt 1915:4). Kekaukukui was reportedly a hub for *kōnane* (a type of pebble board game). Westervelt (1915:4) states:

> Kekaukukui was the place where small konane (checker) boards were laid. These were flat stones with rows of little holes in which a game was played with black and white stones. Here Mamala and Ouha drank awa and played konane (Westervelt 1915:4).

Westervelt (1915:4) also holds that Kamehameha V's father, Kekuanaoa, built his home at Kekaukukui.

Kewalo
Kewalo, which is translated as "the calling," represented a vast *kula* and coastal region, but is now a name that refers to a manmade basin on the coastline of Kakaʻako. Westervelt (1915) provides a glimpse of ancient Hawaiian practices that took place in this area, stating:

> Kewalo was the place where the Kauwa, a very low class of servants, were drowned by holding their heads under water, according to the law known as "Ke-kai-he-hee." "Kai" means "sea" and "hee" means "surf-riding" or "sliding along." The law meant the sliding of the servants under the waves of the sea (Westervelt 1915:3).

He also holds that Kewalo is the nesting place of the owl responsible for initiating the great battle between the legendary owls who gathered from Hawaiʻi to Kauaʻi and chief Kakuhihewa's army. In this story, the protagonist, Kapoʻi, came across pueo eggs as he was gathering pili grass on the slopes of Punchbowl. Kapoʻi collected the eggs for his dinner, but the owl pleaded for Kapoʻi to return the eggs. After the pueo shamed the protagonist and correctly answered the correct number of eggs he found, Kapoʻi gave in to the pueo and returned the eggs. His acquiescence and return of the eggs reflects his acceptance of the owl as

his *'aumākua*." As Kapoʻi was beholden to the owl, he was commanded to erect a *heiau*, make it *kapu* (sacred), and perform rites there. These actions were strictly prohibited by the ruling chief of Oʻahu, Kekuhihewa. Upon hearing the actions that Kapoʻi took, Kekuhihewa ordered the lawbreaker to be captured and killed upon Kūpalaha Heiau. However, the pueo then amassed an army of owls who successfully freed Kapoʻi from his gruesome fate at Kūpalaha Heiau (Westervelt 1915: 135-137). Kukaeunahiokapueo, which means "the confused noise of owls rising in masses," is the traditional place name of the great battle of the owls (Spearing et al. 2008).

In the legend of Pumaia, Kewalo was the location of a battle in which Pumaia killed all of Kualii's warriors and officers (Fornander 1917:492).

Hua-nui-ka-lā-laʻilaʻi, one of Oʻahu's distinguished chiefs, was born at Kewalo. The following *mele* recorded by Kamakau (1991) describes this event:

ʻO Hua-a-Kamapau ke ʻliʻi	Hua-a-Kamapau the chief
O Honolulu o Waikīkī	O Honolulu, of Waikīkī
I hanau no la i kahua la i Kewalo,	Was born at Kewalo,
ʻO Kālia la kahua	Kālia was the place [the site]
O Makiki la ke ēwe,	At Makiki the placenta,
I Kānelāʻau i Kahehuna ke piko,	At Kānelāʻau at Kahehuna the navel cord,
I Kalo i Pauoa ka ʻaʻa;	At Kalo at Pauoa the caul;
I uka i Kahoʻiwai i	Upland at Kahoʻiwai, at
Kanaloahoʻokau . . .	Kanaloahoʻokau. . .
(Kamakau 1991:24)	

Kolowalu

Kolowalu, which encompassed a large fishpond, is located within Kukuluāeʻo and abutted the lands of Kālia and Kewalo. Kolowalu is an ancient benevolent law that existed during the reign of Kualii, which is explained by Fornander (1917) as:

> It was strict, unvarying and always just. It was for the care and presentation of life; it was for the aged men and women to lie down in the road with safety; it was to help the husbandmen and the fishermen; to entertain (morally) strangers, and feed the hungry with food. If a man says, "I am hungry for food," feed [him] with food, lest he hungers and claims his rights by swearing the kolowalu law by his mouth, whereby that food becomes free, so that the owner thereof cannot withhold it; it is forfeited by law. It is better to compensate. He who swears must observe the law faithfully, lest he be accountable to the law of the king which he has sworn to observe, and the punishment be upon him. If it is simple robbery of others' food, or of others' property, then severe punishment shall be meted out to the person who violated the law. A transgressor, or one who is about to die, is, under the application of this law exonerated of his death or other penalty. Through the uprightness of his [Kualii's] law, and the honesty with which he administered the government, God preserved him, so that he lived a long life, and his is that notable life spoken of in the annals of the ancient people, of the king of Oahu, who lived four times forty and fifteen years. In the last stage of life he was bent with age and withered, with the eyes reddened and bedimmed; and

> was carried about in a netting. He died at Kailua, in Koolaupoko, in A.D. 1730, in the one hundred and seventy-fifth year of his life (Fornander 1917:432).

Kou

The area now referred to as Honolulu (lit. Sheltered or Protected Cove) was traditionally referred to as Kou, due to the fact that *kou* tree groves were prominent features in its landscape. According to Kamakau (1976), Honolulu as the name of a locality originally referred to a *loʻi kalo* (taro patch) located at what is now the intersection of Liliha and School Streets, which bore the name of its caretaker, Honolulu. Because Honolulu was so well loved, Kamakau states that "his descendents gave this name to the whole ahupuaʻa" (1976:7). Westervelt (1915:1) holds that there are various translations for the place name of Honolulu, including "Sheltered Hollow" and "abundance of peace." He further states:

> "Honolulu" was probably a name given to a very rich district of farm land near what is now known as the junction of Liliha and School Streets, because its chief was Honolulu, one of the high chiefs of the time of Kakuhihewa, according to the legends. Kamakau, the Hawaiian historian, describes this farm district thus: "Honolulu was a small district, a pleasant land looking toward the west, — a fat land, with flowing streams and springs of water, abundant water for taro patches. Mists resting inland breathed softly on the flowers of the hala- tree."
>
> Kakuhihewa was a king of Oahu in the long, long ago, and was so noted that for centuries the island Oahu has been named after him "The Oahu of Kakuhihewa." He divided the island among his favorite chiefs and officers, who gave their names to the places received by them from the king. Thus what is now known as Honolulu was until the time of Kamehameha I., about the year 1800, almost always mentioned as "Kou," after the chief Kou, who was an "Ilamuku," or "Marshal," under the king Kakuhihewa. "Kou" appears to have been a small district, or, rather, a chief's group of houses and grounds, loosely denned as lying between Hotel Street and the sea and between Nuuanu Avenue and Alakea Street (Westervelt 1915:1-2).

Westervelt (1915:8) also states that Kou was likely the most prominent place on Oʻahu to play *kōnane*, which is an ancient board game played with pebbles. He describes the *kōnane* hub as being located near to the temple; likely Pākākā Heiau. This is upheld in a proverb from Pukui's *ʻŌlelo Noʻeau*:

> *Hāhā pōʻele ka pāpaʻi o Kou.*
> The crabs of Kou are groped for in the dark.
> (Pukui 1983:50-51)

This proverb refers to one who "goes groping in the dark," but alludes to the days in which the chiefs of Kou held *kōnane* games at the shoreline of Kou, which often lasted into the night, causing the spectators to "grope for their companions" (Pukui 1983:51). The *kōnane* games also drew spectators from all over the island, as is suggested in the next proverb:

Hui aku na maka i Kou.
The faces will meet in Kou.
(Pukui 1983:120)

She explains, "We will all meet there, Kou (now central Honolulu) was the place where the chiefs played games and people came from everywhere to watch" (Pukui 1983:120).

Kukuluāeʻo

Kukuluāeʻo means "to walk on stilts" and shares the name with the Hawaiian Stilt (*Himantopus himantopus*), which would have frequented the marsh area. Pukui et al. (1974) holds that Kukuluāeʻo once fronted Kewalo Basin and described it as being marsh lands with salt ponds and fishponds. Kamakau (1865) states that Kukuluāeʻo was a well-known area in the pre-Contact era with a *heiau* called Puʻukea. Maly et al. (2013) describes the area as near shore.

Kulaokahuʻa

Kulaokahuʻa translates "the plain of the boundary" in Pukui et al. (1974:123). Alternatively, it may be translated as "plain of Kahuʻa," Kahuʻa being the name of a star; or if the *okina* is left out, *kahua* is generally a site for habitation or sports, such as *ʻulu maika* (Pukui and Ebert 1986:113,178). This area consists of the plain that abuts the northern boundary of the project area, defined in the story of Peapea, famed warrior during the time of Kahahana, in Fornander (1819:458) as "the level section between Waikīkī and Punchbowl." Kulaokahuʻa has been described as barren and dry in several accounts (Gilman 1909:9-91; Fornander 1819:458; Pukui 1983:84-85).

Emerson mentions Kulaokahuʻa in the legend of Hiʻiaka, the goddess Pele's sister as she passed through the area:

> ... Their route lay eastward across the dusty, wind-swept plain of Kula-o-kahu'a - destined in the coming years to be the field of many a daring feat of arms; - then through the wild regions of Ka-imu-ki, thickset with bowlders [sic] - a region at one time chosen by the dwarf Menehune as a sort of stronghold where they could safely plant their famous ti ovens and be unmolested by the nocturnal depredations of the swinish Kama-pua'a. Hi'iaka saw nothing or took no notice of these little rock-dwellers. Her gaze was fixed upon the ocean beyond, whose waves and tides they must stem before they reached and passed Moloka'i and Maui, shadowy forms that loomed in the horizon between her and her goal (Emerson 1915:185-186).

The area has been the backdrop of several pre-Contact *moʻolelo*, such as the stories of Pikoi, the rat hunter, Hanaaumoe, the trickster hero, and the story of the famed runner, Kaohele. Kulaokahuʻa was also the setting of several pre- and early Contact battles (Fornander 1819:474; 496; O'Hare and Hammatt 2004:8-9). Kulaokahuʻa has also been referred to as a sports and game playing field. In *The Islander* (Thrum 1875), Kulaokahuʻa is described as a fair ground in which games are played as well as celebratory events in proposing an exposition for the discovery of Hawaiʻi by Captain Cook in 1778:

> Probably the most practical way for to celebrate the occasion, will be to hold a national fair at Kulaokahua grounds in Honolulu, which exhibit all possible Hawaiian resources; which exhibition may be supplemented with sports, match games of ball, boat and canoe racing, &c., &c., [sic] military and other parades, and exercises of a more literary and artistic character, -addresses and music. There is little doubt but that the whole population, natives and foreigners, would enter into such celebration with enthusiasm… (Thrum 1875: Vol. 1; No. 25, p.1).

Thus, the vast plain of Kulaokahuʻa has been well documented in accounts from the pre-Contact era to well into the Historic era.

Kuloloia

The shore of Kuloloia is mentioned by Thrum in the story of *Aiʻai, Son of Ku-Ulla* (Thrum 1900:123-128). In the passage, Aiai walked along the shore of Kulolia to Pākākā and Kapapoko. Maly et al. (2013:42) describes Kuloloia as having been a beautiful sandy beach as well as some of the figures associated with it. Also, a number of *aliʻi* dwelt there and there were *heiau* spread across its shoreline, between Pākākā and Honuakaha. Ī`ī (1959) states that the chiefess Nāmahana lived at the shore of Kuloloia and died in her home. He adds that one of her nephews present during her death was named Kuloloia in afterwards. A single proverb was found referring to Kuloloia in Pukui (1983):

Ka iʻa maunu lima o Kuloloia.
The hand-baited fish of Kuloloia.
(Pukui 1983:149)

As Pukui explains, "Small eels (*pūhi ʻōilo*) that were caught by placing bait on the open palm of one hand with the fingers held wide apart. When the eels came up to take the bait, the fingers were clenched into a tight fist, grabbing the eels tightly by the heads" (Pukui 1983:149). This provides some information on what marine resources were available as well as what fishing methods were used.

Kōʻula

Kōʻula, which translates as "red sugar cane," was a locality in or adjacent to Kewalo (to the north). Maly et al. (2013:41) cite Kamakau (1865) who stated that these lands were cultivated under the orders of the chief, Hua, who is said to have taken care of his people. This land is located partially within the Catholic Cemetery and the Ward property.

Māmala

Māmala, or Kekaiomamala, is the Traditional name for Honolulu Harbor and translates as "fragmented or broken." This bay was the most prominent waterway and boat landing for Kou. As a result, Māmala was the backdrop of many key events and legends of pre-Contact Hawaiʻi. Māmala Bay was named after the famed chiefess who was known to be an ardent surfer. According to Westervelt (1915),

> Ke-kai-o-Mamala was the name of the surf which came in the outer entrance of the harbor of Kou. It was named after Mamala, a chiefess who loved to play konane (Hawaiian checkers), drink awa, and ride the surf. Her first husband was the shark-man Ouha, who later became a shark-god, living as a great shark outside the reefs of Waikiki and Koko Head. Her second husband was the chief Hono-kau-pu, to whom the king gave the land east of the land of Kou. This land afterward bore the name of its chief, Hono-kau-pu. In this section of what is now called Honolulu were several very interesting places (Westervelt 1915:2).

Several proverbs referring to Māmala were found in Pukui (1983):

> He *kai hele kohana ko Māmala.*
> A sea for going naked is at Māmala.
> (Pukui 1983:71)
>
> *Ka nuku o Mālama.*
> The mouth of Mālama.
> (Pukui 1983:163)
>
> *Ke kai ʻau umauma o Māmala.*
> The sea of Māmala, where one swims at the surface.
> (Pukui 1983:184)
>
> *Na ʻale kuehu o Māmala.*
> The billows of Māmala with wind-blown sprays.
> (Pukui 1983:235)

To elucidate the first proverb, Pukui (1983:71) holds that "The entrance to Honolulu Harbor was known as Māmala. In time of war the people took off their clothes and traveled along the reef to avoid meeting the enemy on land." The second proverb refers to a shark goddess who once lived in Honolulu Harbor and is who the entrance is named after. The last two proverbs provide some visuals of what the conditions could be at Māmala and what activities occurred there.

Mauna Kilika
Mauna Kilika, is translated by Maly et al. (2013:44) as "Silk Mountain," which is named for the mounds of silk cloth brought in by foreigners in the Historic era that were often traded for Hawaiian products. Mauna Kilika is also the location of the former residence of Judge Mataio Kekuanaʻoa on the shore of Kuloloia. Mauna Kilika was later named Hale Kauwila. According to Goodale (1897:5), Mauna Kilika was also referred to as the Armory. It was built in 1840 and was one of the first Government buildings in Honolulu. The building is where the Parliament and Land Commission met and is the location of several historical events, including writing of the first constitution.

Pākākā
Pākākā, which means "to glide as on the surf," (Andrews 1922:664) is the Traditional name for the coastal lands at the south end of what is now Fort Street (Īʻī1959). Although the most prominent structure of Pākākā was its *heiau*, several historic accounts speak of houses, likely

those of the *aliʻi*, being located in the area (Īʻī 1959:82). In fact, Pākākā was the location in which Kaʻahumanu and Kaumualiʻi lived together from 1822-25, before Kaumualiʻi died in 1825 (Kamakau 1992:265). The article, "Famous Men of Early Days," in *Fornander's Collection of Hawaiian Antiquities and Folk-lore*, Pākākā is mentioned:

> KEKUAWAHINE was a master hand at deceiving and falsifying; he could turn an untruth into a reality; from correct to incorrect, and so forth. When Kamehameha was residing at Pakaka, Kona, Oahu (that is the place where "White man Jim" lives), at the time that the islands from Hawaii to Niihau were subjugated by him, he was living with his wife, Kaahumanu (Fornander 1917:421).

According to Īʻī (1959:82) the wharf at Pākākā was where people crowded to greet the canoes and boats of Kaumualiʻi upon his arrival to meet with Kamehameha.

Puʻuiki
Puʻuiki translates to "little hill or mound" and is a surf break in Māmala (Maly et al. 2013).

Puʻukea
Puʻukea, which literally means "white hill," is a *heiau* in Kukuluāeʻo, east of Kaʻākaukukui. This *heiau* is said to have been built for Hua-nui-ka-lā-laʻilaʻi, who was born Hua-a-Kamapau at Kewalo (Kamakau 1991: 24-25). In "A Chant for Kualii," Puʻukea is where *mahiki* grass danced (Fornander 1917:396). Pukui and Ebert (1986) maintain that *mahiki* grass is used to exorcise evil spirits.

Puʻunui
Puʻunui translates as "large hill or mound" and is a land division in Nuʻuanu that has several coastal *lele* located from Queen Street past Hale Kauwila Street into Kaʻākaukukui and bounded by South and Coral Streets. These *lele* were known to have salt making ponds.

ʻUlakōheo
According to Maly et al. (2013:48), ʻUlakōheo translates as "Red penis head" and is the name for an area located near the shore between situated near the shore and Queen, Maunakea, Nuʻuanu, and Marine Streets.

Ulukua
Westervelt (1915:3) holds that Ulukua, which was located "near the lumber-yards at the foot of the present Richards Street," was once "the place where idols were made." The waters off of Ulukua is where Kamehameha's single canoe greeted the fleet carrying Kauaʻiʻs regent, Kaumualiʻi (Īʻī 1959:82). Maly et al. (2013:49) states that Ulukua is the site of the Honolulu Lighthouse, which is no longer standing.

Waikahalulu
Translated as "roaring water," Waikahalulu is an ʻili between lower Nuʻuanu and Pauoa Streams as well as below Hale Kauwila Street where it meets ʻĀina Hou, Kuloloia, and Kaʻākaukukui (Maly et al. 2013:49). This area is mentioned in the canoe story where Kakae, a

descendant of Menehune, needed a canoe to search for her brother. Thus, the Menehune built a canoe for her overnight to help Kakae, but did not get it into the water by daylight and left the canoe in a ditch near Waikahahulu (Beckwith 1970:333). Figure 3 illustrates the approximate locations of the *inoa ʻāina* and *wahi pana* in what is now referred to as Kakaʻako.

3.1.4 Heiau of Kakaʻako

Several *heiau*, varying in scale, antiquity, and purpose, once stood in the area now referred to as Kakaʻako. Figure 4 is Rockwood's artistic rendering of Papaenaena Heiau, which was a *luakini heiau* once located in Waikīkī.

Pākākā Heiau

Pākākā Heiau was located west of the south end of Fort Street and was built sometime prior to the reign of Chief Kakuhihewa (Westervelt 1915:8). Kuhoʻoneʻenuʻu, the principal god of Oahu ruling chiefs, was the god of Pākākā Heiau (Beckwith 1970:29). This *heiau* was also the headquarters for all of Oʻahu's priests and that its walls were "adorned all around with heads of men offered in sacrifice" (Westervelt 1915:8). Thrum (1905:45, 57) also holds that Pākākā Heiau was of the *poʻokanaka* (human head) class and located in Honolulu but the actual site was not found. However, he later states:

> Search for the Pakaka and Kaheiki heiaus mentioned by Kamakau, and classed as pookanaka, has not given satisfactory results, though in a native description of early Honolulu, following the Okuu pestilence of 1804, there was located at Pakaka (known later as Robinson's point), heiaus of a medical class under one Papa, termed "na heiau kahuna lapaau." Kamakau having classed his of this name or location as a sacrificial heiau relieves it from confusion with this medical kahuna school (Thrum 1905:60).

In the "Myth of Haumea as Kamehaikana," (Beckwith 1970:281-282) Kou's ruling chief at the time of Papa and Wākea was Leleho'omao, who attempted to sacrifice Wākea at Pākākā Heiau for his crime of trespassing.

A prominent *kōnane* playing area and famous boulder was located on one side of the *heiau* (Westervelt 1915:8). In the Historic period, Pākākā Heiau came under the ownership of Kinau, mother of Kamehameha V (Westervelt 1915:8).

Kaheiki Heiau

According to Beckwith (1970:332) Kaheiki Heiau "built by the Menehune and presided over by the kahuna who founded the priesthood called Moʻo-kahuna." A foreigner called, Kahanai-o-ke-akua (Adopted by the gods), was raised by Kane and Kanaloa at Waolani heiau before residing at Kaheiki (Beckwith 1970:332). Kamakau (1961:292) reiterates a story where Boki is warned against disturbing a large boulder in the stream that is the guardian of Kaheiki, lest bad luck befall him and to the surrounding areas.

Beckwith (1970:345) summarizes as story told by Westervelt (1915) about a cannibal "dog-man," named Kaupe, who lived at Lihue on Oʻahu. The story of Kaupe involves a great *kahuna* from Kaheiki Heiau. The story is as follows:

> Among dog-men represented as overthrowing the chief of a district and terrorizing the country, the most famous is the cannibal dog-man Kaupe who overthrew the government of Ka-hanai-a-ke-akua (Reared by the gods) and ruled the land from Nuʻuanu to the sea.
>
> Kaupe lives at Lihue on Oahu. He never attacks a high chief but eats some of the people both of Oahu and Maui. At last he crosses over to Hawaii and brings back a chief's son to sacrifice in the heiau at Lihue. The father follows to Oahu and consults Kahilona, the great kahuna at the heiau of Kaheiki just below the hill called today Pacific Heights, which was built by the Menehune and which becomes under Kahilona the center for the moʻo-kahuna class of priests; that is, for kilokilo who read the signs of earth and sky and sea. This kahuna teaches the chief from Hawaii the prayer to recover his son, which runs
>
> "O Ku, O Lono! O Kanaloa!
>
> By the power of the gods, by the strength of this prayer,
>
> Save us two, save us two!"
>
> The prayer unfastens the boy's fetters and father and son flee and hide under a rock at Moanalua while Kaupe goes on to look for them on Hawaii. The father learns the prayer for killing an enemy, and overcomes Kaupe on Hawaii (Beckwith 1970:345).

Puʻukea Heiau

The name Puʻukea literally means "white hill" and is said to be a *heiau* built under the management of a chief named, Hua-nui-ka-lā-laʻilaʻi, who hailed from Kewalo. This chief was born under the name Hua-a-Kamapau, but received the name from his subjects for his benevolent rulership (Spearing et al. 2008; Maly et al. 2013).

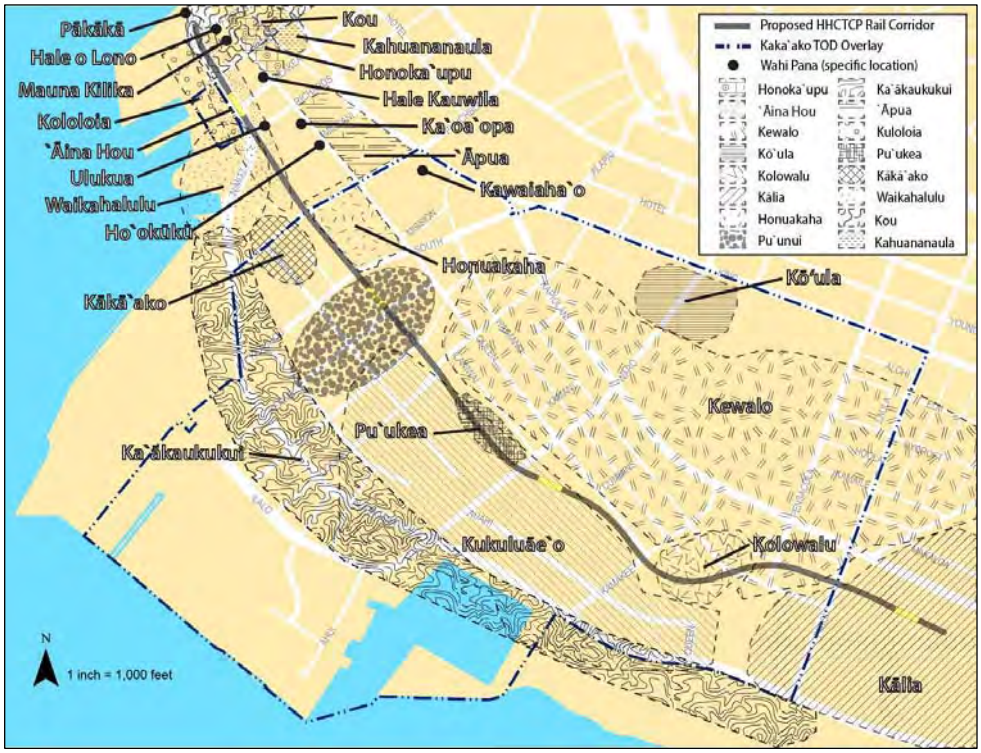


Figure 3. ***Inoa ʻāina*** **&** ***Wahi Pana*** **in Kakaʻako and vicinity.**

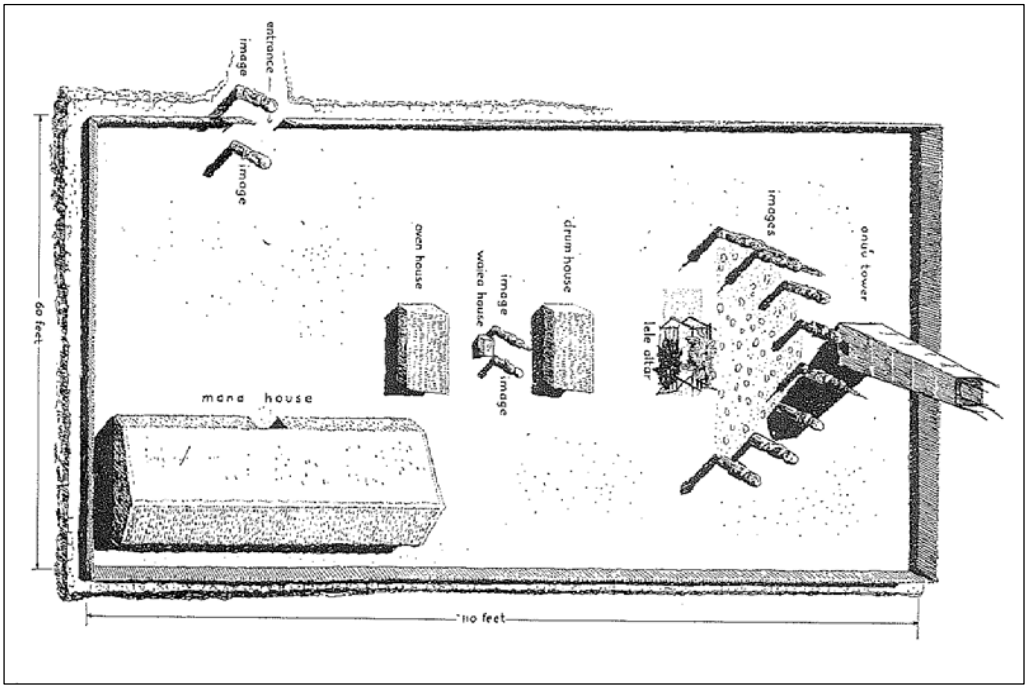


Figure 4. Rockwood's rendering of a ***luakini heiau*** **(in Ī'ī 1959:34).**

3.2 POST EUROPEAN CONTACT CULTURAL LANDSCAPE

The islands of Hawai'i have undergone dramatic changes since its discovery by Native Hawaiians, which is now debated to be no earlier than 1200 years before present (Kirch and McCoy 2007). The arrival of Europeans in the late 1700s sets the scene for a different drama to unfold (Figure 5). After European contact until the present, Kaka'ako has gone through even more radical changes in the physical and cultural landscape due to the decline of the Native Hawaiian population and the increasing influence of Western and Asian immigrants. In this period, Kaka'ako has gone from a hinterland between the two major localities, Kou and Waikīkī, to the governmental seat and recreational area of O'ahu's royalty and *ali'i*, subsequently, the urban and industrial heart of the island.

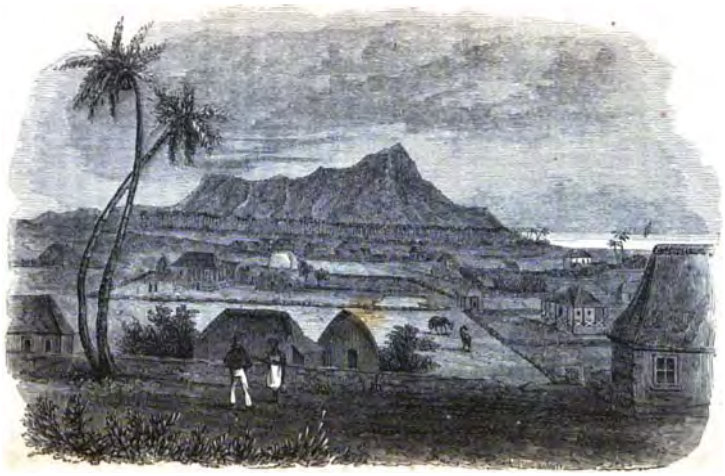


Figure 5. Early Historic Image of East Honolulu (Bates 1854:95).

3.2.1 European Contact

Previous cultural studies (Spearing et al. 2008; Vogeler et al. 2010; Genz & Hammatt 2010; Elison and McElroy 2011; Maly et al. 2013) have documented scores of early Contact observations and anecdotes for the region now referred to as Kaka'ako. This Supplemental CIA provides additional early references to the physical environment, events, and people of the area.

The earliest written reference to the Island of O'ahu was recorded by Captain James Cook in 1778, where he described O'ahu as "…the most Easterly of these islands, seen by us…we could get no other intelligence, but that it is high land, and is inhabited" (Cook 1784:222). Following

Captain Cook were Captains Portlock and Dixon of the HMS King George and Queen Charlotte, who interacted with the inhabitants of the island as described by Calcott et al.:

> Captains Portlock and Dixon 1786, were the first followers of Cook: they, being on a trading voyage to the Northwest coast for furs, procured refreshments at Oahu; and about the same time La Perouse visited Maui: from that year ships frequently touched there. The natives, profiting by their intercourse with them, had become so sensible of the utility of our vessels, that they had boldly attacked a brig and a snow [sic]; and actually did possess themselves of a small American schooner, the crew of which, with the exception of one man, they murdered. Isaac Davies, the fortunate person who escaped, was mate of the vessel. He had been ashore at the time of the capture, and took refuge with the king of Hawaii, who treated him most kindly, and in whose service he remained (Calcott et al. 1826:29-30).

Portlock and Dixon provided the earliest written accounts of topographical features and inhabitants of O'ahu's south coast, possibly from the bay of Waikīkī or Kou:

> The island of Woahoo between the South East and North East points appears high and craggy forming into several high rocks within which there appears to be tolerable shelter but as the wind blew fresh and right on shore, I did not think it prudent to run in with a lee to look for anchorage.
>
> We plied in this uncertain state till noon on the 1st of June when finding it would be impracticable for us to get round the North East point of the island without wasting more time than could be spared we bore away for the South East point; and at one o clock being well up with it, a fine bay made its appearance, which promised to afford good anchorage. We hauled round the point and stood in for the bay. Soon afterwards the whale boat was lowered down and sent in shore to sound. At half past two o clock we came to an anchor in the bay which I distinguished by the name of King George s Bay, in twelve fathom water, over a bottom of speckled sand and broken shells…
>
> Soon after our arrival, several canoes came off and brought a few cocoa-nuts and plantains, some sugar-cane and sweet root; in return for which we gave them small pieces of iron and a few trinkets. Towards evening, a fresh breeze coming on at East North East, our visiters [sic] left us, and returned on shore.
>
> Next morning at daylight we had several canoes about the ship, which brought us a few small hogs and some vegetables. Great numbers of both sexes were in the water, impelled by curiosity to pay us a visit, notwithstanding our distance from shore (Portlock 1789:68-70).

At about the arrival of Europeans in 1778, nearby Waikīkī was densely populated, verdant, and prosperous. One observation given by Captain George Vancouver in 1792 upholds this view of the post-Contact period Waikīkī. Vancouver states:

> …in this bay, which the natives call Whyteete, seemed nearly as eligible as most of the anchoring places these islands are generally found to afford…On the

> shores, the villages appeared numerous, large, and in good repair; and the surrounding country pleasingly interspersed with deep, though not extensive valleys; which, with the plains near the sea-side, presented a high degree of cultivation and fertility…our guides led us to the northward through the village, to an excavation exceedingly well-made causeway, about twelve feet broad, with a ditch on each side… This opened to our view a spacious plain, which, in the immediate vicinity of the village, had the appearance of open common fields in England; but on advancing, the major part appeared to be divided into fields of regular shape and figure, which were separated from each other by low stone walls, and were in a very high state of cultivation …planted with the eddo or taro root, in different stages of inundation…some from three to six or seven inches under water…At Woahoo, nature seems only to have acted a common part in her dispensations of vegetable food for the service of man; and to have almost confined them to the taro plant, the raising of which is attended with much care, ingenuity, and manual labour…(Vancouver 1798: I, 161- 164).

Vancouver's descriptions illustrate the intensity of agriculture in *mauka* Waikīkī as well as the fitness of its irrigation and infrastructure at the period of European Contact. Archibald Menzies, who travelled on the Vancouver Expedition as a surgeon and naturalist also commented on the flourishing state of Waikīkī at this time period:

> … the shore was planted with a large grove of cocoanut palms, affording a delightful shade to the scattered habitations of the natives. Some of those near the beach were raised a few feet from the ground upon a kind of stage, so as to admit the surf to wash underneath them. We pursued a pleasing path back to the plantation, which was nearly level and very extensive, and laid out with great neatness into little fields planted with taro, yams, sweet potatoes, and the cloth plant. These, in many cases, were divided by little banks on which grew the sugar cane and a species of Dracena without the aid of much cultivation, and the whole was watered in a most ingenious manner by dividing the general stream into little aqueducts leading in various directions so as to be able to supply the most distant fields at pleasure, and the soil seemed to repay the labor and industry of these people by the luxuriancy of its productions. Here and there we met with ponds of considerable size, and besides being well stocked with fish, they swarmed with water fowl of various kinds such as duck, coots, water hens, bitterns, plovers, and curlews…They frequently offered us both musk and water melons, which they thought might be more acceptable to us as they received the seeds from Britannee…On returning to the beach after a circuit of about three miles, we found that they had dressed hogs and taro for us, but as we had neither time nor much inclination to eat anything, they insisted on packing them up cleanly in leaves and putting them into our boats (Menzies 1920: 23-24).

An earlier account of Waikīkī given by Captains Portlock and Dixon in 1785, offers interesting commentary on the pre-Contact Hawaiian religion and culture, which follows:

> Next morning at eight o'clock the long-boat came along-side, and Mr. Hayward informed me, that on going down to the place where his guide conducted him in Queen Charlotte's Bay, he found a small bay with very deep water, close to a sandy beach, where the natives generally landed with their canoes, but no place

> for a ship to ride in with safety ; adjoining to the beach, in a beautiful valley, surrounded by fine groves of cocoanut trees and a delightful country, there was a large town, where (as Towanooha informed him) the king generally resided, and the district round it was called Whyteetee. According to Mr. Hayward's account, there were very few canoes in the bay; neither did he see any great number of inhabitants; so that we may reasonably suppose they were come into the bay where we lay, led either by business or curiosity.
>
> Not a single native came near the ships for two days, and their canoes were hauled out of sight, but we could perceive vast numbers of the inhabitants about the house on the hill. During this time our people were busily employed about the rigging, and getting the ship ready for sea.
>
> At daylight in the morning of the 17th the old priest, attended by his yava-chewer Towanooha, came on board. The old man seemed quite enraged at the king's recent conduct; he told me that the king and all his principal chiefs had been making offerings to their gods, and consulting them; but that the gods were good for nothings and that the king and his adherents were no better than villains, for intending to do us any mischief, after the many presents they had received from both ships. I thanked my old friend for his intelligence, and told him that we should be constantly on our guard.
>
> For some days past I had been strongly importuned by Towanooha, and a very fine young man of the first consequence in the island, who was a constant companion of the king's, to take them along with me to Atoui; and indeed Taheeterre had more than once urged me to take them; but I never thought they were in earnest until this forenoon, when the young chief, whose name is Paapaaa, came on board, and joined his entreaties with those of Towanooha in so very pressing a manner, that I promised to take them on board; and they returned on shore in order to prepare themselves for the passage. The yava-chewer, being now as it were a gentleman passenger, no longer considered himself as a servant, but took to drinking yava heartily, and laid in a plentiful stock of that root.
>
> In the afternoon we had a fresh gale from the East North East, with frequent squalls, which prevented any canoes coming near us. Towards evening I observed the natives uncovering and pulling to pieces their new built house on the hill ; and about eight o'clock several large houses were on fire along shore near the bay ; but as we had no Indians on board, I could not learn whether they were set on fire by accident or design, till the next morning, when the old priest and our two passengers coming on board, I enquired the reason of the fires we had seen on shore the preceding evening; and was given to understand, that they were Eatooa's, or houses belonging to gods with whom the chiefs were displeased; therefore out of revenge they had burnt gods and houses both together. In the forenoon a great number of large and small canoes came off and brought us a tolerable supply of various sorts of vegetables and a few hogs. Since our water was completed, having expended several casks, I directed the natives to bring us a further supply, which they very soon did in great abundance.

> The king also, with his retinue, paid me a visit; at his first coming on board he seemed rather shy, but upon the whole he conducted himself nearly in his usual manner. On my taking notice of the red house on the hill he appeared a good deal confused, and waving that conversation, begun to talk about his two countrymen who were going with me to Atoui. He seemed very much interested in Paapaaa's welfare; he particularly requested me to take care of him and treat him well, and if we flopped at Atoui, he begged that I would leave him under the care of Taaao, who it seems is brother to Taheeterre, and a relation of Paapaaa's. The two passengers asked me for a few trifles to leave amongst their friends before they set off, which I readily gave, and also made the king a present; on which he took leave of me for the last time, and after taking a very affecting one of his countrymen, particularly of Paapaaa, he quitted the ship and went on shore; the other canoes remained alongside to dispose of their cargoes, and we procured a supply of good hogs, which enabled me to set the falters to work again. In the afternoon the rigging was set up, the fails bent, and every thing ready for sea (Portlock 1789:164-167).

The fact that King Kamehameha I had begun his campaign to unify the islands in the early 1780s may explain some of the drastic changes befalling the social structure and religion of Oʻahu at this time.

Captain Vancouver (1798) also recorded his interactions with European seamen from the American sloop, Lady Washington, whom had been living on Oʻahu and other islands to arrange sandalwood and pearl exports prior his arrival on Oʻahu in 1792, stating:

> At Woahoo and also on our arrival here we were given to understand that there were Englishmen resident on this island.
>
> One of them a young man about seventeen years of age, whose name was Rowbottom, came on board in a large double canoe; who said he was of Derbyshire, that he had sailed from England about five years since in an Indiaman to China, which ship he had quitted in order to engage with some of the vessels in the fur trade between North-West America and China; and that he had, ever since, been thus employed in the American service. He informed me, that himself, John Williams, a Welchman, and James Coleman an Irishman, had been left at Onehow, in order that they might return to this island for the purpose of collecting sandal-wood, and pearls, for their master John Kendrick, an American, commanding the brig Lady Washington, in whose service they still remained at the wages of eight dollars per month. The Lady Washington had quitted these islands the preceding October, bound to New England, with a cargo of furs to dispose of in her way thither at China; she was immediately to return from Boston, and having spent the next winter in North-West America, was, in the autumn of the ensuing year, to call for these men at Attowai, and take in a cargo of sandal-wood for the Indian market, with such pearls as they might have collected (Vancouver 1798:172).

In March of 1794, Vancouver (1798) wrote in his journal about the short survey he made from sea of the island of Oʻahu. Vancouver had planned on landing on the island during this sojourn; however, due to heavy surf they were only able to investigate the north shore and

southeast point of the island before heading to the island of Kauaʻi. At Kauaʻi, Vancouver joined an American brig, the Lady Washington, whose crew members had gone ashore for five days at Waikīkī just days prior. He states:

> Here we rejoined the American brig Washington, which had sailed with us from Karakakooa, but had directed her course to the southward of the islands, for Whyteete in Woahoo, where she had remained five days. Amongst other articles that Mr. Kendrick had procured whilst there, was eighty pounds weight of very fine bees wax, that had drifted by the sea on to the shores of that island, and had very recently been picked up by the natives; and I now understood that some pieces had also been procured from the natives of the other islands by Mr. Kendrick, who in a great measure confirmed the account contained in Mr. Brown's letter to me, of the very improper conduct of the merchant seamen who had deserted, or otherwise quitted the vessels to which they had belonged, for the purpose of residing amongst these islanders. In this number were some whom we had formerly left at Attowai but he now seemed to be determined that they should no longer remain on that island (Vancouver 1798:121-122).

These early commentaries provide an idea of how much interaction with Europeans the Native Hawaiians had prior to the first written accounts.

3.2.2 Kakaʻako in the 19th Century

The 19th Century proved to be a time of total transformation for the area now referred to as Kakaʻako. Traditional Hawaiian dwellings, transportation, and cultural practices quickly succumbed to Western customs – forever changing the people and their landscape from Kou to Waikīkī and *mauka* to *makai*. Figures 6 and 7 provide a glimpse of what the early 19th Century Kakaʻako vicinity landscape was like.

The earliest European visitors found two major Hawaiian settlements flanking Kakaʻako as we know it today: Kou (now Honolulu) and Waikīkī. Kou was depicted as having ample coastal fishponds and irrigated agricultural areas. Waikīkī, the initial governmental seat, had a complex system of *loʻi kalo* (taro patches) and *auwai* (irrigation ditches) that extended across the *kula kai* (seaward plain) as well as coastline studded with fishponds. Most early 19th Century descriptions of the area focus on either Kou or Waikīkī, yet, some accounts of travels between the two localities were recorded. An early 19th Century passage from the journal of Archibald Campbell, a Scottish-born seaman on board the merchant ship, Thames Indiaman, describes his first impression of Honolulu (Hanaroora) in 1809:

> Three miles to the west of Whyteete is the town of Hanaroora, now the capital of the island, and residence of the king. The harbour is formed by the reef, which shelters it from the sea, and ships can ride within in safety in any weather, upon a fine sandy bottom. There is a good channel through the reef, with three or four fathoms water; but if there is a swell it is not easily discovered, as the sea often breaks completely across. Pilots, however, are always to be had; John Hairbottle, captain of the Lily Bird, generally acted as such. The best anchorage is in five fathoms water, about two cables length from the shore, directly in front of the village. Ships sometimes anchor on the outside of the reef, but they run the risk of having their cables cut by the coral (Campbell 1819: 110).

Figure 6. Portion of Von Kotzebue's 1817 Map of South Oahu with approximate project area.

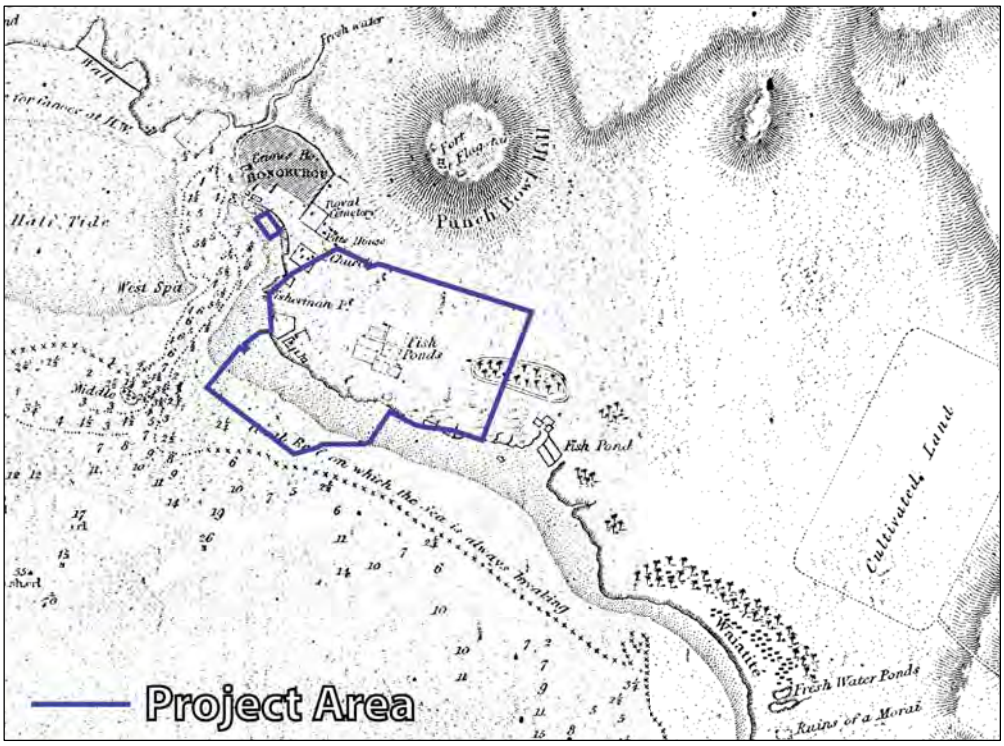


Figure 7. Portion of the 1825 Malden Map of South Oahu with approximate project area.

> The entrance to this harbour may probably, at no very distant period, be filled up by the growth of the coral, which must be rapid indeed, if Hairbottle, the pilot, was correct, when he informed me that he knew a difference of three feet during the time he had been at Hanaroora.
>
> A small river runs by the back of the village, and joins the sea at the west side of the harbor; owing to the flatness of the country, the water is brackish, and there is none fresh to be had within several miles of the place. Ships, however, can be supplied at a moderate rate by the natives who bring it from the spring in calabashes (Campbell 1817:110-112).

Campbell also documented his first encounter with King Kamehameha (Tamaahmaah) and his court in Honolulu:

> Tamaahmaah, king of Owhyhee, Mowee, Wahoo, and the adjoining islands, resided some years at this place. His house, which we could distinctly see from the ship, was built of brick, after the European manner. Of late, he has fixed his residence at Wahoo; upon learning which, the captain determined to proceed thither. […]
>
> A number of natives came off, as usual, the moment the ship hove in sight. King Tamaahmaah was in a large double canoe; on his coming alongside, he sent his interpreter on board to announce his arrival.
>
> The captain immediately went to the gangway to receive his majesty, and shook hands with him when he came upon deck.
>
> He was, on this occasion, dressed as a European, in a blue coat and grey pantaloons.
>
> Immediately on his coming aboard, the king entered into earnest conversation with the captain. Amongst other questions, he asked, whether the ship was English or American? being [sic] informed that she was Russian, he answered, " Meitei, meitei," or, Very good. A handsome scarlet cloak, edged and ornamented with ermine, was presented to him from the governor of the Aleutian islands. After trying it on, he gave it to his attendants to be taken on shore. I nevar [sic] saw him use it afterwards. In other canoes came Tamena, one of his queens, Crymakoo, his brother-in-law, and other chiefs of inferior rank.
>
> My appearance attracted the notice, and excited the compassion of the queen; and finding it was my intention to remain upon the islands, she invited me to take up my residence in her house. I gladly availed myself of this offer, at which she expressed much pleasure; it being a great object of ambition amongst the higher ranks to have white people to reside with them. When the ship was brought to anchor, she sent me ashore in one of her canoes. […]
>
> Upon landing I was much struck with the beauty and fertility of the country, so different from the barrenness of the Fox islands [sic]. The village of Hanaroora, which consisted of several hundred houses, is well shaded with large cocoa-nut

> trees. The king's residence, built close upon the shore, and surrounded by a pallisade [sic] upon the land side, was distinguished by the British colours and a battery of sixteen carriage-guns, belonging to his ship, the Lilly Bird, which at this time lay unrigged in the harbour. This palace consisted merely of a range of huts, viz. the king's eating-house, his sleeping-house, the queen's house, a store, powder-magazine, and guard-house, with a few huts for the attend ants, all constructed after the fashion of the country.
>
> At a short distance were two extensive store-houses, built of stone, which contained the European articles belonging to the king. (Campbell 1817:85-88).

Sadly, Campbell had both of his feet amputated just prior to landing in Hawaiʻi. Campbell (1817) describes the hospitality of Kamehameha and his court during his 1809 visit to Honolulu:

> I was conducted to the house occupied by the two queens. It consisted of one large apartment, spread with mats; at one end of which the attendants of both sexes slept, and at the other the queens occasionally slept when the king was in the morai.
>
> They and their attendants always eat here, and Tamena wished me to join them; but as I had been informed by Crymakoo, that if I did so, I should not be allowed to eat with men, I resolved to decline her offer. […]
>
> His principal chiefs being always about his person, there were generally twenty or thirty persons present; after being seated upon mats, spread on the floor, at dinner, a dish of poe, or taro pudding, was set before each of them, which they ate with their fingers, instead of spoons. This fare, with salt fish and consecrated pork from the morai, formed the whole of the repast, no other food being permitted in the king's house. A plate, knife and fork, with boiled potatoes, were, however, always set down before Moxely and me, by his majesty's orders. He concluded his meal by drinking half a glass of rum, but the bottle was immediately sent away, the liquor being tabooed, or interdicted to his guests. The breakfast and supper consisted of fish and sweet potatoes. […]
>
> When the king was absent on these occasions [ceremonial obligations], I did not experience the same attention as at other times; the attendants became very remiss in providing my dinner, and I was sometimes obliged to go without it altogether (Campbell 1817:89-92).

Campbell's account speaks to the kindness that King Kamehameha I afforded him, possibly due to his condition. Campbell also wrote of the king's men carrying him about on their shoulders as well as the king granting him lands in the Waimano area of ʻEwa just before he journeyed back to Europe (Campbell 1817).

Honolulu, the inhabitants of Honolulu, King Kamehameha I, his royal court, and the royal residence were further described in 1822 by the English writer and world-traveler, Gilbert Farquhar Mathison (1824), albeit laden with Western bias:

At two o'clock P. M. we could plainly distinguish the huts, canoes, and persons of the natives on the sea-shore — some employed in fishing, others in mending their nets. The shipping and smoke of Hannah-rourah, the capital of the Sandwich Islands, soon after came into view, and the approach of some boats and canoes kept us all in a state of agreeable excitement. At three o'clock we anchored in the roadstead, and received visits from several American residents. They assured us that no danger was to be apprehended from the natives, with whom they had been accustomed to live upon the most amicable footing, and that some Missionaries and their families were likewise established there. Mr. Jones, the American Consul, kindly offered me accommodation for the night, which I accepted, and immediately accompanied him on shore, leaving my fellow-passengers, who were less eager and impatient, to follow the next day.

Upon landing, we were immediately surrounded by a mob of men, women, and children, who pressed forward to shake me by the hand, and eyed me with great apparent curiosity. They were all dressed *au naturel*, or nearly so, with nothing but the maro, a cincture of cloth made from the paper mulberry-tree, round their waists; their cries were most discordant, and the clatter of women's tongues not the least audible. I afterwards found out that they were settling a nickname for me, in allusion to some peculiarity in my dress or person. This they do invariably, whenever a stranger comes among them; and it is astonishing how quick-sighted, and even witty, they often are, in ridiculing the least affectation of manner, awkwardness of gait, or bodily deformity.

Having thus encountered their jokes on first landing, I went with the Consul to the palace of the King, if such a term can be applied to a grass hut, floored with mats, and only distinguished from the rest by a few cannon placed about it *in terrorem*. Imagination had pictured the monarch, sitting in the midst of his chiefs with dignified composure, his interpreter on one side and secretary on the other, (for he really has two such officers); and, as the subject of a brother king, I anticipated a most gracious reception. What, then, was my astonishment on entering the royal hut! "Oh, majesty! Oh, high ambition, lowly laid I" The royal beast lay sprawling on the ground in a state of total drunkenness and insensibility. On one side of his head was extended an enormous sow, which every now and then gave a grunt, as if in sympathy with its master; and upon the other side sat his Queen, an immense woman, like him, almost in a state of primitive nudity, who seemed endeavouring, though in vain, by her caresses, to assuage his beastly transports: a few chiefs and domestics, in all about twenty, completed the group — some asleep, others fanning away the flies, and singing the wildest and harshest lullaby that ever saluted mortal ears.

We then passed into another room belonging to the head Queen; who, though equally large in her person, had a benevolent and pleasing cast of countenance. She was dressed in a loose robe of English chintz, and, to my delight, was engaged in learning to write, which she had only attempted within a few days. She showed me her performance on the slate with great eagerness; and well she might, for really the letters were by no means badly formed. I then underwent, as on my first landing, a thorough examination, during which her Majesty often laughed immoderately, and ended her remarks by saying that I was a mere child, and had no beard.

The ground part of the apartment was matted, and the walls hung round with mats, with a large and handsome mirror on one side, and upon the whole had a comfortable appearance ; though the furniture, comprising several Chinese chests, a mahogany table, and three matted bedsteads — in addition to the living furniture, comprising her Majesty the Queen and her numerous attendants, who lay extended on the floor in different attitudes, and kept up an incessant singing sort of noise- gave to the whole scene a truly fantastic character.

Mr. Jones accommodated me at night with a bed in his hut, and introduced me the next morning to the other American residents, who were all seafaring men, and had come to this place to carry on a trade for sandal wood (Mathison 1824:362-366).

Mathison's account provides a lens in which early European visitors viewed Native Hawaiians. As people and customs were described, the early 19th Century landscape of what is now considered Kakaʻako were also documented by several early visitors to the locality. Mathison (1824) later described the countryside during his walk from Honolulu to Waikīkī in 1822:

After dinner this day I went ashore and walked with a friend to Whyteete, a village on the sea-side, about five miles from the port. Our route lay first over an open plain, but we afterwards passed through cultivated fields, which are divided from each other by embankments. They are very extensive, and are planted with the tarrow-root, which appears to be the principal or rather sole object of cultivation. Artificial irrigation is essential to the growth of this plant, upon which, in a great measure, the Sandwich Islanders subsist. It is regularly planted in rows, each one or more in a little bed of soft mud surrounded by water; and the whole field being inundated, banks from two to three or four feet in height are raised on every side, so as to keep the water within proper limits, and at the same time make a partition of property (Mathison 1824:373-374).

In 1823, Reverend William Richards of Plainfield, Massachusetts, and fellow missionary, Charles Stewart of Flemington, New Jersey, arrived in Hawaiʻi. After spending some time in Honolulu, the two sailed to Maui and described the contrast between the two localities:

The thick shade of the bread fruit trees which surround his cottages the rustling of the breeze through the bananas and sugar cane the murmurs of the mountain streams which encircle his yard and the coolness and verdure of everything around us seemed in contrast with our situation during a six months voyage and four weeks residence on the dreary plain of Honoruru [sic] like the delights of an Eden and caused our hearts to beat warmly with gratitude to the Almighty Being… (Richards and Stewart 1823:39).

Another, somewhat contrary, account of Kakaʻako's coastal area and abundant fishponds in the early historic period was provided by Andrew Bloxam, who was the naturalist on the HMS Blonde in the mid 1820s. Bloxam stated in 1825:

…The whole distance [along the coast from Honolulu] to the village of Whyteete is taken up with innumerable artificial fishponds extending a mile inland from

> the shore, in these the fish taken by nets in the sea are put, and though most of the ponds are fresh water, yet the fish seem to thrive and fatten. Most of these fish belong to the chiefs, and are caught as wanted. The ponds are several hundred in number and are the resort of wild ducks and other water fowl. It is pleasantly situated and built along the shore among numerous groves of coconut and other trees, and in this respect far better than Honoruru, as scarcely any trees are to be found there. Diamond Hill, the southeast point of the island, is about two miles beyond… Near one of its sides are the remaining walls of an old morai or temple; the sea washes its base and hence it forms a good landmark for ships (Bloxam 1925: 35-36).

The early 19th Century was a period of raid period of population growth in the area now known as Kakaʻako. In 1820, Protestant missionaries associated with the American Board of Christian Foreign Missions (ABCFM) first arrived in the Hawaiian Islands. A comment on the demographics of early Honolulu and the embrace of Christianity by its people was provided in a letter by the Joint Missionaries in Hawaiʻi to the ABCFM in 1823, stating:

> Honoruru, the present seat of government, occupies about one square mile and contains about 550 houses. Allow 50 to be uninhabited, and allow eight souls to each house of the remaining 500, including persons who are present from other districts and other islands, and the number of souls a the village of Honoruru is 4,000. It is truly animating to see one fourth of this number including the king and several of the principal chiefs of the islands, come out on the Sabbath to the place of worship, filling the house to overflowing and thronging the doors and windows, as if they would know what our new doctrine is (Joint letter of the Missionaries 1823:314).

In the 1820s, a surge in population, commerce, industry, and government was seen in Honolulu. In an article titled, "The Early Streets of Honolulu," Gillman describes Pākākā as a busy maritime community as well as the location that male and female convicts were hung before becoming a shipyard in the 1827, stating:

> Before describing Fort street [sic] we will take a look at the famous premises of James Robinson & Co., at that time the only ship builders and repairers on the islands and in fact in the Pacific. It was a rather peculiar partnership in the make up of the firm which began in 1822, though the shipyard at the point, "Pakaka," was not established till 1827. The firm comprised Jas. Robinson, Robt. Lawrence and Robt. Holt. The two former were together in the Hermes, which vessel with the Pearl, set forth from this port on a whaling cruise, and both ran ashore twenty days out on an unknown reef afterwards named for the lost vessels. Mr. R. built a schooner from the wrecks in which with eleven others he reached these islands in Oct. 1822. This vessel was the foundation of their subsequent business and fortune. Mr. Robinson, the senior of the firm, was considered a ship carpenter of skill and ability; Mr. Lawrence, familiarly called "Bobby," was the book keeper, house keeper, and general steward of the establishment. Some of his boarders, all men, used to remark that the bread which he made occasionally tasted of the oakum which he was in the constant habit of picking from bits of tarred rope which he carried in his pocket. Mr. Holt was an American and much the best equipped for managing the business of the partners. They occupied for

> their headquarters a two-story stone building under the walls of the old fort, the lower part unoccupied except for storage, the upper part used as office and living apartments. At the time of the death of the last surviving partner, Mr. James W. Austin, who was their attorney, went into the lower part and, guided by some directions, unearthed a large amount of coin which had been secretly and safely buried there.
>
> Proceeding along Queen street [sic] on the makai side, we come to the old fort. This is so historically well known that it needs no description from me. Its walls extended along the street to some distance past Fort street [sic], at the foot of which the large gateway- served for entrance and exit. Over this gateway on two occasions were erected scaffolds for the execution of two couples, men and women, for having committed murder. Indicative of the natives' superstition was an incident connected with the last execution. The streets near and approaching the fort were packed with natives, men and women, who had come from all parts of the island to witness the execution. They had waited as patiently as could be expected for the appearance of the criminals, but the moment that the drop fell, and it was evident that they had paid the penalty of their crime with their lives, the people as if actuated by one common thought, cried out "Ghosts, Ghosts," and ran like a flock of frightened sheep in the opposite direction as fast as their legs could carry them, and in a short space of time the streets were cleared (Gilman 1900:81-82).

The sandalwood trade was an important element in the growing economy of Honolulu. Thrum (1905) describes such areas as Pākākā and Kakaʻako as important localities in the Oʻahuʻs early sandalwood trade:

> Some years before the arrival of Alex. Adams[1] search was made in the mountain forests for sandalwood. Because of the fragrance of the naio[2] it was supposed that it would meet the demands, therefore, this variety of wood was taken to China, but found to be worthless. In consequence of this the iliahi was assured to be the wood wanted, whereupon diligent search in the forest stretches of these islands was made, and there was sent on certain American vessels this desired kind of wood. There were three three-masted vessels which sailed for China, and each vessel took several natives to help on the voyage and in their discharge at China.
>
> Upon the return of the vessels they anchored off Mamala[3] while the boats passed on from ITaka[4] to Pakaka[5]. The boats were gaily decorated, and the men wore soldiers' red coats and had shiney [sic] hats on their heads. They were thought to be foreign man-o-war's men when in fact they were the returned Hawaiians from China. Men, women and children gazed at them from below Kakaako, Pakaka and other places, as they strolled about, for it was the first known of these new things in Honolulu. "Wonderful indeed"! was the expression of the time. But these and all other things of the kind were Kamehameha's.
>
> Being assured that the sandalwood of these islands had real value, large numbers of the people throughout the group were sent to collect it, and it became the article of trade. And because of this, vessels came to these harbors continuously from that time. It was thought that upon Kamehameha's removing to Hawaii a

large increase in sandalwood trading vessels would follow, for these captains took frequent cargoes of it to China whereby, it was said, their owners became very wealthy. And thus it probably was with the majority of the vessels which traded for sandalwood at the various ports. * *

It is said that an agreement was made between the king and the captain that conveyed the chiefs in their inter-island travels, to load up the Lelepali[6] with sandalwood and dispose of it and the vessel, for it was becoming old. This plan was carried out and a foreigner of good standing was placed in charge thereof and sailed for China. * * *

In due time there returned here the one who took the Keoua Lelepali with sandalwood to China, and it is said he placed in the hands of the king $10,000. If the report is true there is ground for belief in the foresight of the king in his course with the vessels and Americans, as has been shown.

1 Captain Alex. Adams arrived at the islands in 1816.
2 Bastard sandalwood — Myoporuin sandwicensis.
3 The anchorage outside the spar buoy.
4 Light house point.
5 Robinson's point.
6 Known also as Keoua Lelepali.
[Note: ** and *** were not defined]
(Thrum 1905:278)

A sad commentary was made by early missionary, Levi Chamberlain, on the state of the Native Hawaiian population in the 1830s, which was ravaged by disease for several years prior, during his tour around the island of O'ahu. Chamberlain's journal states:

…The view here given of the apparent of population at this group of islands, the evidence that former generations of natives were less vicious, more civilized, industrious, and more happy, than the generation which the missionaries found there, agrees with what has been written on same subject by others. There is in every part of the heathen world which been explored that the people were more wicked, more superstitious, more ignorant of the arts of civilised [sic] life, more debased in their affections, and more miserable; and so they will probably continue to do, until the gospel arrests this progress in degeneracy. Captain Cook estimated the population the Sandwich Islands at 400,000 while at present it does not exceed 150,000. Pestilence, wars, infanticide (extending to two thirds of all the children born), and prevailing depravity, are the causes assigned for this decrease. The scene here described by Mr. C is a few miles east of Honoruru.

Our path led us along the borders of extensive plots of marshy ground, having raised banks on one side or more, and which were once filled with water, and furnished abundantly with esculent fish, but now overgrown with tall rushes waving in the wind. The land all around for several miles has the appearance of having been once under cultivation. I entered into conversation with the natives respecting its present neglected state. They ascribed it to the decrease of population. There have been two seasons of destructive sickness, both within the period of thirty years, by which, according to the account of the natives, more

than one-half of the population of the island was swept away. The united testimony of all of whom I have ever made any inquiry respecting the sickness, has been, that 'Greater was the number of the dead than of the living.' Making due allowance for the hyperbolical manner in which the natives sometimes express themselves, it may, I think, be safely asserted, that since the discovery of these islands by captain Cook there has been a decrease of population by desolating wars, the ravages of disease, and other causes, equal, at least, to one-half the number of the inhabitants that might have been fairly estimated at the time that celebrated voyager last visited these islands (Chamberlain 1957:26).

In the mid-19th Century, Hawai'i also underwent perhaps, the most drastic changes to traditional Hawaiian land use, cultural practices, and politics. In 1845 and 1846, The Organic Act paved the way for the Māhele 'Āina, which introduced the concept of private property into Hawaiian society. The lands, traditionally held in stewardship by the *ali'i* (chiefs) of Hawai'i were divided in 1848 under Kamehameha III. Land titles, or Land Commission Awards (LCA), were granted by the Board of Commissioners also known as the Land Commission (Chinen 1958). In 1848, the crown, the Hawaiian government, and the *ali'i* received their land titles. As a result of a general misunderstanding of new land ownership laws and influence of alcohol during transactions, many Native Hawaiians lost rights to lands that they inhabited and farmed for generations. Despite the loss of land rights that many Hawaiians suffered from the Māhele'Āina, LCA and the documents supporting these claims, such as applications, Native Testimonies, and Foreign Testimonies afford a glimpse of how these lands were used traditionally.

The area now referred to as Kaka'ako contained numerous LCA (Spearing et al. 2008; Genz & Hammatt 2010; Elison and McElroy 2011; Maly et al. 2013; Hammatt 2013) with a total of 80 LCA falling in or adjacent to the Kaka'ako TOD Overlay project area (Table 1). Several large properties were set aside as crown lands, including the Kulaokahu'a Plains, which include much of the *kula* lands north of King Street (O'Hare and Hammatt 2004:21).

Table 1. LCA Found in and Adjacent to the Kaka'ako TOD Overlay Project Area

LCA	Awardee	'Ili	Description & Comments
2	Robert Kilday	Kula, Pualoalo	Robert Kilday at Nuuanu, Oahu. "…The land in Nuuanu Valley called Pualoalo and two fish ponds thereto attached (in Kukuluaeo) has been in my possession and granted me, by his present Majesty, Kamehameha III, since 182 …The fish ponds are situated about two miles from the land, but are considered an appendant to that land…Witness testified that they are to be used as fish ponds, by old usage a tenant would not be allowed to fill up a fish pond…" (Spearing et al. 2008:41; Maly et al. 2013:234)
19	Naahu	Waikahahulu	House lot (Hammatt 2013: Vol.II,Sec.2, p.51-52)
23	Smith, Oliver, Moeino	Waikahahulu; Kaholoakeahole	Six *kalo lo'i* and one house lot; on Water & Waialeale Streets (Hammatt 2013: Vol.II,Sec.2, p.51-52; Maly et al. 2013:74)
61 MA	Namakeha	Honoluu, Kaalaa	Lot at Halekauwila Street; One of several awarded to Namakeha, who was a member of Kamehameha II's privy council and uncle of Queen Emma (Spearing et al. 2008:41; Hammatt 2013: Vol.II,Sec.2, p.73-74)
62	Kinaiuka	Honuakaha	A lot bounded on one side by the pond of Kuwili (Jourdane & Dye 2007:6; Maly et al. 2013:235)

LCA	Awardee	ʻIli	Description & Comments
63	Namauu, Nueku	Waikahalulu; Honuakaha	Was a member of Board of Commissioners to Quiet Land Titles (Spearing et al. 2008:41; Hammatt 2013: Vol.II,Sec.2, p.51-52; Hammatt 2013: Vol.II,Sec.2, p.51-52)
97 FL	Kapapa	Kālia	Three *kio pua* (a holding pond for raising fish fry). (Elison & McElroy 2011:42; Maly et al. 2013:236)
98 FL	Kaehuokalani	Kālia	Two fishponds (Maly et al. 2013:236)
99 FL	Uma	Kālia	House lot bounded on side by a fish pond (Maly et al. 2013:236)
100 FL	Kekeula	Kewalo/Kālia	Taro ponds, fishponds, a patch, a house site, and a pasture (Elison & McElroy 2011:42)
120 FL	Kaanaana	Kālia	Seven *kio pua* (a holding pond for raising fish fry). (Maly et al. 2013:236)
116	Paki, Abner	Honuakaha	House lot at corner of Punchbowl & Queen Streets (Jourdane & Dye 2007:6)
129	Kinimaka	Honuakaha; Kaoaopa; Kakaʻako; Waikahahulu	House lot near Queen & Punchbowl Streets, fishpond, shoreline, Punchbowl St., roadway: Parcel 1. The nature of this survey is for the house lot parcel of Kinimaka at Honolulu, Oahu. Contains 2 Acres, 20 chains, 25 fathoms and 15 feet. (Helu 129, Kinimaka; Honolulu, Oahu; Mahele Award Book 2:59-60) (Spearing et al. 2008:41; Hammatt 2013: Vol.II,Sec.2, p.51-52)
148	Ehu, Enoka	Honuakaha	House lot at Corner of Punchbowl & Queen Streets (Jourdane & Dye 2007:5)
164	Kekūanaoʻa, M. for Kamāmalu, V.	Kuloloia	House lot (Hammatt 2013: Vol.II,Sec.2, p.51-52)
176	Kekūanaoʻa, Mataio	Honuakaha	House lot at Corner of Mililani & King Streets (Mahele Award Book 2:997-998) (Jourdane & Dye 2007:5)
180	Kekūanaoʻa, Mataio for Kamehameha III	Kakaʻako	House lot (Hammatt 2013: Vol.II,Sec.2, p.73-74)
182	Kamāmalu	Honuakaha	House lot (Jourdane & Dye 2007:6)
191	Kekauonohi	Kuloloia	House lot (Hammatt 2013: Vol.II,Sec.2, p.51-52)
195	Kamahiai	Kawaiahaʻo	House lot: Kamahiai at Honolulu, Oahu. Land at Kawaiahao, bounded on Waikiki side by a fish pond; (Spearing et al. 2008:41; Maly et al. 2013:236)
200	Kaina, M.	Kawaiahaʻo; Koula	House lot (Spearing et al. 2008:41)
214	Manuiai	Honuakaha	House lot (Jourdane & Dye 2007:6)
238	Hoalilio	Honuakaha	House lot (Jourdane & Dye 2007:6)
247	Lunaliloa, W.C. by Kanaina	Honuakaha; Waikahalulu, Kakaʻako	House lot: This was received by Kekauluohi in the time of Kamehameha I and she resided there peaceably until her death in the year 1845, when it was bequeathed to her son Wm. Lunalilo. 122 83/100 Fathoms. (Mahele Award Book 2:1005).(Spearing et al. 2008:41; Maly et al. 2013; Hammatt 2013: Vol.II,Sec.2, p.51-52)
255	Hakau, Wahine	Honuakaha	Across Punchbowl St. of Kawaiahaʻo Cemetery (Spearing et al. 2008:41)
272	Booth, Joseph	Kukuluāeʻo	Three fish ponds Royal Patent 306 (Genz & Hammatt 2010:26; Maly et al. 2013:236)
274	Booth, Joseph	Koula	House lot: 12 acre estate (Royal Patent 306 to Joseph Booth) (Spearing et al. 2008:41)
298	Namakeha, B.	Waikahahulu	Two house lots (Hammatt 2013: Vol.II,Sec.2, p.51-52)
343	Kahiewalu	Honokaʻupu	Lot mapped at corner of Likelike & King Streets (Jourdane & Dye 2007:6)

LCA	Awardee	ʻIli	Description & Comments
387	American Board of Christian Foreign Missions (ABCFM)	Beretania Street; Punahou, Kawaiahaʻo, Kukuluāeʻo, Kamakapili	This is a claim by the Sandwich Island Mission, on behalf of the [ABCFM], for a certain land situated in the District of Waikiki, Island Oahu, called "Punahou"… and a sea-land called "Kukuluaeo." From the evidence submitted to the Board, it appears, that this land was given by Governor Boki about the year 1829 to Hiram Bingham for the use of the Sandwich Islands Mission, and that the same, with the exception of certain portions occupied by Kauhi, Wahineino, and other Natives, has been in the peaceable possession of the said Mission … (Mahele Award Book 1:599-502). (Spearing et al. 2008:41; Genz & Hammatt 2010:26; Hammatt 2013: Vol.II,Sec.2, p.73-74)
569	Puniwai	Honolulu, King Street	House lot: bounded on *makai* side by an old fish pond. (Spearing et al. 2008:41)
603	Hoonaulu	Waiahaʻo, King Street	House lot (Spearing et al. 2008:41)
635	ABCFM	Kawaiahaʻo	Lot for Kawaiahaʻo Church and Cemetery (Jourdane & Dye 2007:5; Spearing et al. 2008:41)
637	Kuluwaiienua	ʻĀpua	House lot (Jourdane & Dye 2007:5)
673	Naiwi	Kawaiahaʻo	Naiwi at Waiahao (Kawaiahaʻo?), Honolulu, Oahu. A fish pond which I made. Lot bounded by fish pond of Haole papa (Kilday), toward the sea. (Spearing et al. 2008:41; Maly et al 2013: 236)
677	M. Kekūanaoʻa for V. Kamāmalu	Honuakaha	Houses, Queen Street, ponds, govt. land; Helu 677 received before enacting the Law in 1832…Surveyed by C.J. Lyons; 3 lots at Honuakaha, Honolulu. Containing therein 8 9/10 Acres… (Mahele Award Book 2:75) (Spearing et al. 2008:41; Genz & Hammatt 2010:26; Maly et al 2013: 236; Hammatt 2013: Vol.II,Sec.2, p.73-74)
685	Pehu	Kawaiahaʻo	No data (Spearing et al. 2008:41)
704	Honaunau	Waikahalulu; Kakaʻako	House lot: Beginning at the makai Northern corner of this land, along Alanui Puowaina (Punchbowl St.); 217 fathoms. (Mahele Award Book 2:681) (Spearing et al. 2008:41; Maly et al 2013: 236; Hammatt 2013: Vol.II,Sec.2, p.73-74)
728	Holualoa	Kawaiahaʻo	House lot: Controversy exists on LCA 728 as Mahele Award Book 2:111) awards it to Holualoa, but was not dated and was signed by possibly unauthorized official (in Carter v. Kaikainahaole) (Spearing et al. 2008:41)
729	Kekuhaaupio	Honuakaha	Royal Patent Helu 1730, Vol. 6:727-728; near Queen St. Retaining the rights of the people, Containing 1.53 acres. (Mahele Award Book 2:113; Royal Patent Helu 1730, V6: 727-728) (Spearing et al. 2008:41; Maly et al. 2013:113; Hammatt 2013: Vol.II,Sec.2, p.73-74)
735	Kaahumanu	Honuakaha	Received in the year 1822; House lot parcel. Containing 722 fathoms, 5 feet, square. (Mahele Award Book 2:123 [illegible]; Royal Patent Helu 5722 – V22:351) (Spearing et al. 2008:41; Maly et al. 2013:114; Hammatt 2013: Vol.II,Sec.2, p.73-74)
738	Kaunuohua	Kuloloia	House lot received in the year 1829; 476 fathoms, 16 feet (Maly et al. 2013:115; Hammatt 2013: Vol.II,Sec.2, p.51-52)
773	Kealoha	Waikahahulu	House lot received in the year 1817; 488 fathoms, 34 feet (Maly et al. 2013:116; Hammatt 2013: Vol.II,Sec.2, p.51-52)
784	Robinson, James	Waikahalulu	Wharf lot: given by Karaimoku to James Robinson in 1827 (Mahele Award Book 3:108-110) (Maly et al. 201:117)
805	Kaahuea	Honuakaha	One house on fenced lot (Spearing et al. 2008:41)
824-B	Niau	Kawaiahaʻo, King Street	Iona Piikoi stated that Niau lived at this lot with her first husband, just after the Kauaʻi war (in Foreign Testimony V-03, S-10:455) (Spearing et al. 2008:41)

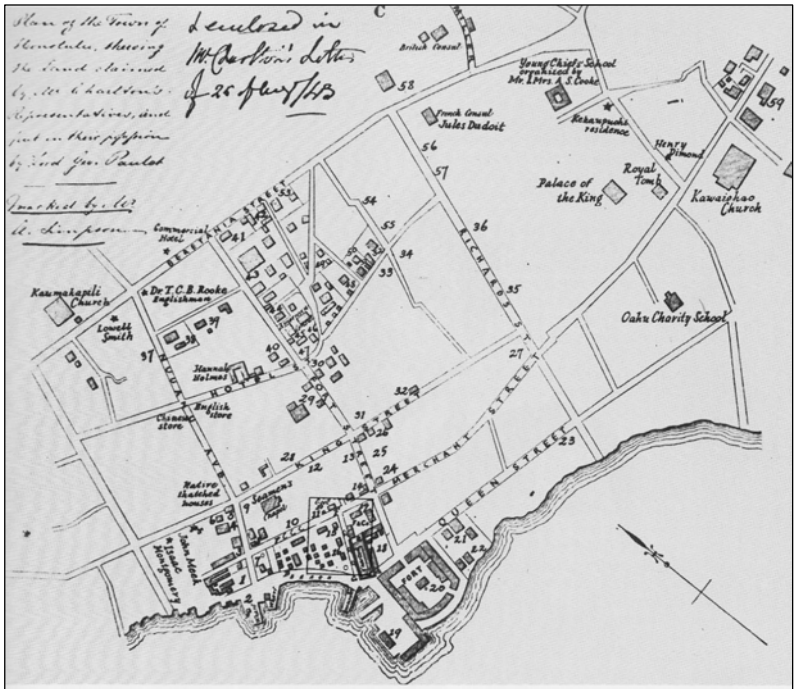
LCA	Awardee	ʻIli	Description & Comments
982	Kukao	Koula, Kukuluāeʻo	… Received in the year 1821 [illegible] House lot of Kukao at Kukuluaeo, Honolulu, Island of Oahu; 944 fathoms, and 34 square feet. (Mahele Award Book 2:389) (Spearing et al. 2008:41; Maly et al. 2013:130; Hammatt 2013: Vol.II,Sec.2, p.73-74)
1082	Kekuanui	Honuakaha, Puʻunui	House, salt pond, & fish pond (Spearing et al. 2008:41)
1366	Wahiena	Kukuluāeʻo, Puʻunui	One lot: consisted of 12 salt ponds, no house; received land from Honokaʻupu in time of Kinau (Spearing et al. 2008:42)
1499	Kapalu	Kewalo, Kukuluāeʻo	House lot: one house, partly fenced; also a fish pond in the ili of Kewalo and a salt pond at Kukuluāeʻo (Spearing et al. 2008:42)
1503	Puaa	Kukuluāeʻo, Kewalo	Three fishponds at Kukuluāeʻo; land transferred from Puaaʻs heir, G. Luka, and widow, Holinaka, to J. Magoon in 1881) (Spearing et al. 2008:42; Maly et al. 2013:137; Hammatt 2013: Vol.II,Sec.2, p.73-74)
1504	Pahiha	Kukuluāeʻo, Kewalo	…His place is at Kewalo in Honolulu, on the island of Oahu, and was received from Iona Pehu in the year 1847…House lot of Pahiha at Kewalo…Containing 1174 fathoms. (Mahele Award Book 10:27).(Spearing et al. 2008:42; Maly et al. 2013:139; Hammatt 2013: Vol.II,Sec.2, p.73-74)
1592	Kauo	Kukuluāeʻo, Kewalo	Boundary shared with LCA 9971 Apana 26: S. 63° 20' W. True 141 feet along Garden lane to NE L (Spearing et al. 2008:42)
1903	Lolohi	Kukuluāeʻo	Two salt ponds, fifteen drainages, two *poho kai* (hollow where sea remains at low tide), one salt kula (flat) (Spearing et al. 2008:42)
2019	Pupule	Mililani Street, Kakaʻako	Between LCA 8515 (Keoni Ana) and Govt. Land 3251 (Music Hall); across from Aliʻiōlani Hale (Spearing et al. 2008:42)
2045	Kawahi	Puʻunui	He made his claim for his House lot at Puunui in the lele of Alialia, Honolulu, Island of Oahu. He received this place in the time of Kamehameha I. It was a vacant land, and he made a house there, and has resided there unopposed…House lot at Puunui, Lele of Alialia at Honolulu, Oahu. This land is surrounded by the Konohiki. 549 1/1 fathoms within this House lot (Mahele Award Book 10:166).) (Spearing et al. 2008:42; Maly et al. 2013:143; Hammatt 2013: Vol.II,Sec.2, p.73-74)
3169	Koalele	Kewalo	Seven fish ponds at Kewalo) (Spearing et al. 2008:42; Maly et al. 2013:240; Hammatt 2013: Vol.II,Sec.2, p.73-74)
3455	Kaule	Kakaʻako	He has applied for his place at Kakaako in Honolulu, Kona, on the Island of Oahu. He received this place from Kanakanui, and has resided peaceably there with no opposition to this time…House lot claim at Kakaako. Containing therein, 22/100th acre. (Mahele Award Book 9:687) (Spearing et al. 2008:42; Maly et al. 2013:157; Hammatt 2013: Vol.II,Sec.2, p.73-74)
3848	Puhalahua	Honuakaha	House lot: next to Pahale o Niau and bound by Mission Ln., Queen St., & South St. (Spearing et al. 2008:42)
4457	Kʻoloa, Ana	Kakaʻako	She has claimed her place at Kakaako in Honolulu, Kona, on the island of Oahu, having received this place in the time of Kamehameha I, and having lived upon it unopposed to this time… A house site and four Loko Ia (Fish Ponds) at Kakaako, Honolulu, Kona, Oahu. Containing 48/100th of an acre. (Mahele Award Book 10:533) (Spearing et al. 2008:42; Hammatt 2013: Vol.II,Sec.2, p.73-74)
6245	Kalaeokekoi, P.T.	Auwahiolimu	Returned to Crown (Spearing et al. 2008:42)
6489	Kaihiwa	Kawaiahaʻo, Honuakaha	House lot at Kawaiahaʻo (received from Kamehameha III before death of Kinau in 1839); location: Queen St., *makai*-Waikiki side of Punchbowl St. Kaihiwa died 1848, wife Pohana received his estate (Spearing et al. 2008:42)

LCA	Awardee	ʻIli	Description & Comments
7712	M. Kekūanaoʻa for V. Kamāmalu	Kaʻākaukukui, Puʻunui	Received from King, Kamehameha III in 1848. Property consists of 83 acres in Kaʻākaukukui and Puʻunui with 1 4/10 acres of fishponds. The sea boundary runs along the land of Waikahalulu. (Mahele Award Book 9:664-665; Royal Patent No. 4483) (Spearing et al. 2008:42; Maly et al. 2013:168; Hammatt 2013: Vol.II,Sec.2, p.73-74)
7713	V. Kamāmalu	Honolulu	M. Kekuanaoa for V. Kamāmalu. Counter Claim by the Government. This is a claim set up on behalf of the Hawaiian Government against Victoria Kamāmalu, the Proprietor of the Ahupuaʻa of "Kaakaukukui," lying in Honolulu, Island of Oahu. (Mahele Award Book 3:267) (Spearing et al. 2008:42; Genz & Hammatt 2010:26; Maly et al. 2013:158; Hammatt 2013: Vol.II,Sec.2, p.73-74)
8515	Keoni, Ana	Puʻunui	24 acres in Puʻunui relinquished by A. Keoni (original awarded to C.B.T. Rooke, brother in law married to Grace Kamaikui, LCA 610). (Mahele Book p. 160; Indices 729) (Spearing et al. 2008:42)
9549	Kaholomoku	Kukuluāeʻo	A fish pond and four salt beds at Kukuluaeo. (Spearing et al. 2008:42)
9971	Leleiohoku, W.P.	Pākākā	February 14, 1848… Parcel 38. Parcel of land named Pakaka, occupied by Kimo Robisona (James Robinson)… [Native Register Vol. 4:506; see Claim No. 784, James Robinson.] Land by the name of "Pakaka" joining Fort. Part 1. 1 acre 506 fathoms, Part 2. Area 521 fathoms, inclusive 1 acre 1-20 fathoms (Maly et al. 2013:172)
10463	Napela	Kukuluāeʻo	He has claimed his places at Kukuluaeo, Honolulu, Kona, on the island of Oahu. Having received these places from Kauhi in the time when Kinau was living, and has resided there unopposed to this time…Two parcels of land at Kukuluaeo: Parcel 1. Two Ponds & House site. Parcel 2. A Salt making land… 35/100ths acre. The total contained within the two parcels 1 65/100 Acre. (Mahele Award Book 10:569)) (Spearing et al. 2008:42; Maly et al. 2013:168; Hammatt 2013: Vol.II,Sec.2, p.73-74)
10605	Piikoi, Iona & Kamakee	Kewalo, Puaaloalo, Koula	Ponds and four structures: Parcel 1, Part 3: 2 16/100 Acres of Kewalo and Pualoalo. Parcel 7: 270 acres in what is now Kakaʻako. (Mahele Award Book 10:45-46; 60, 62)) (Spearing et al. 2008:42; Genz & Hammatt 2010:26; Maly et al. 2013:176; Hammatt 2013: Vol.II,Sec.2, p.73-74)
10806	Kamehameha III	Kuloloia	House lot: Iona Piikoi for Kauikeaouli, Kamehameha III at Honolulu, Oahu. Loko Kaimukanaka. "…it belonged in ancient times to Kamehameha I. I have always understood that this loko descended from Kamehameha I to Kamehameha II and from him to the present King. It was formerly a fish pond but is now a salt pond." (Maly et al. 2013:178; Hammatt 2013: Vol.II,Sec.2, p.51-52)
10811	Hana Puhikakaino	Kawaiahaʻo	No data (Spearing et al. 2008:42)
11212	Kekūanaoʻa, Mataio	Corner of Punchbowl & King Streets	House lot: next to Pahale o Hakau (Jourdane & Dye 2007:6)

Aside from the Māhele‘Āina, mid-19th Century events in Kaka‘ako and surrounding areas were punctuated by growth in government, missions, epidemics and disease control as well as the reign and subsequent passing of five Hawaiian monarchs.

While the governmental seat had been rooted in Honolulu since the early 19th Century, Honolulu was declared the capitol of the Kingdom of Hawai‘i in 1850. The city continued to grow rapidly with large-scale and substantial structures to house documents and the workings of government. By the mid-19th Century, Honolulu contained the royal palace, Honolulu Hale, and court house as well as a fort, battery, three hospitals, and growing system of western infrastructure. Honolulu had also had a growth in commerce, with five markets, forty stores, eight hotels, fifteen victualing houses (restaurants), seven grog shops, three billiard tables, six bowling alleys, forty-seven wholesale and retail suppliers, five wharves, two shipyards, and ten printing offices by the late 1840s (Maly et al. 2013:65-66). As the city expanded, so did the interest in economic development. At this time, much of the coastline was covered in fill to make *‘āina hou* (new land), to build more wharves, moorage, and warehouses. The old Pāpū (Fort) at and what was left of Pākākā Heiau were dismantled and/or buried to become a property named the Esplanade, on which the custom house and warehouses were built (Maly et al. 2013:73-74). Salt production also became a major economic force in the mid-19th Century. Figure 8 depicts the configuration of Honolulu in 1843.

In areas outside of Honolulu’s capitol, business, residential, and industrial districts, a marked increase in lucrative, non-traditional agriculture occurred, dominated by Western owned sugar and pineapple plantations. Accompanying this was another surge of immigrants, mostly from China and Japan, to work in the plantations. Chinese and Japanese immigrants soon became the most numerous ethnic groups and eventually became land owners. As a result, the need to sustain these populations gave way to another non-traditional agricultural production: rice farming. Most rice farms were owned and operated by Chinese and Japanese (Nakamura 1979).



Map of Honolulu City—August 25, 1843
(Copy of photostat in Public Archives; original in British Consulate)

Map showing tract of land (rectangular piece near wharf, marked off with dotted lines), which Captain Richard Charlton, British consul general, claimed had been given to him by Kalaimoku, high chief and right hand man of Kamehameha I. Original in the British Consulate, Honolulu.

1. Brinsmade, Ladd & Co.
2. Brinsmade, Ladd & Co. wharf
3. Grimes Store, American
4. Hudson Bay Co.
5. Joe Booth's saloon
6. Native houses
7. Straw houses used as fish market
8. Stephen Reynolds' Store, American
9. Native thatched houses
10. Mr. and Mrs. John Paty
11. Two-story building with lookout
12. Seamen's chapel
13. Pierce & Brewer
14. Small wooden buildings
15. Empty lot 16. Sheds 17. French & Co.
18. Henry Skinner & Co.
19. James Robinson & Co.
20. Old fort and residence Governor Kekuanoa
21. Hale Kauwila, Government House
22. Mauna Kilika, Government House
23. Residence, Kekauouli
24. John Cummins Store
25. Sung & Co. bakery
26. Store 27. Anton Silva
28. C. H. Nicholson, tailor
29. E. C. Webster Store
30. Robert Davis, American
31. Residence, High Chiefs Paki and Konia
32. Residence, High Chiefs Paki and Konia
33. Judge Robertson's residence
34. James Jackson Jarvis
35. Residence, Princess Victoria
36. Residence, William Sumner
37. Scattered native houses
38. Residence, Mr. Skinner, Englishman
39. Father Damon
40. John Colcord, blacksmith
41. Residence, Charles Brewer
42. Mr. Jones
43. Roman Catholic Church
44. Captain John O. Dominis
45. French Hotel
46. Dr. R. W. Wood ..47. Stove
48. Alexander Adams, Englishman
49. Captain Dowsett, Englishman
50. Odd Fellows Hall
51. George Pelly 52. William Wond
53. Captain and Mrs. J. O. Carter
54. William French residence
55. Hawaii Theater
56. Residence, Chief Kaeo and Lahilahi
57. Residence, Chief Haalelea
58. Captain Dominis residence; now Washington Place (residence, governors of Hawaii)
59. American missionary houses

Figure 8. Charlton’s 1843 Annotated Map of Honolulu City (courtesy of Maly et al. 2013:37).

The small pox epidemic of 1853 was one of the most significant events of the 19th Century. Hansen's Disease, also referred to as leprosy, was another malady that plagued Hawai'i at nearly the same time. William Cooper Parke served as Marshal of the Kingdom of Hawai'i from 1850 to 1884, who served under five Hawaiian monarchs during his thirty-four year tenure, and was a member of Kamehameha V's Privy Council. Parke described in his memoirs the great lengths that the Kingdom of Hawai'i went through to prevent and then contain the smallpox epidemic. He describes the chain of events leading up to the epidemic:

> In the month of February, 1853, the ship "Charles Mallory" arrived off the Port with a yellow flag flying from the foremast.
>
> The pilot on going alongside found she had a case of small-pox on board.
>
> The vessel was left outside the port, and the pilot re turned to report the case to the Board of Health. He was ordered to anchor the vessel off Waikiki, where she then was, and the crew with the exception of the sick man were brought on shore, and quarantined in a house that stood near the former residence of Hon. G. W. Macfarlane, at Kapiolani Park.
>
> Here the men were carefully watched and tended by Dr. Hoffman, lest the disease should spread. The sick man was brought to Honolulu, but there was no suitable place to put him.
>
> Prince Lot Kamehameha then offered the use of a house to the Board of Health, which they gladly accepted. This house was a large one, made of grass, in the vicinity of the present Quarantine Station. The house stood on an island, and at high tide was surrounded by water, so that it served the purpose very well.
>
> After taking the patient to the place, and supplying him with what was necessary, no one could be found who was willing to go over and nurse him.
>
> For the first five days he was alone the greater part of the time.
>
> One of the members of the Board went over every morning and prepared the man's food for the day, until he was able to care for himself.
>
> After the vessel had been quarantined for twenty-one days and thoroughly fumigated, she came into port. All the bedding in the forecastle as well as the men's clothing was burned to prevent any further trouble.
>
> After loading with oil the vessel stopped at the Station to take on board the man, who had recovered, and been provided with a new outfit. After the man left the island the house with all its contents was destroyed by fire to prevent any spread of the disease.
>
> As this was the first time such an event had occurred, the Government had no fund from which to defray the expenses of this Quarantine, which amounted to fifteen hundred dollars. I therefore was obliged to pay it myself. […]

> …As no new cases of small-pox appeared for two or three months after the departure of the " Charles Mallory," the authorities felt that they had nothing more to fear in that line; but the one case from that vessel was nothing compared to what followed. On the 13th of May, a man called at my office and reported that two native women living on Maunakea Street were ill, and he feared that the trouble was small-pox. On going to the place the report was found to be true, and a guard was placed around the house, with strict orders to allow no one to leave or enter it. The Legislature was then in session, and on the 16th passed an act authorizing the King, Kamehameha III., to appoint three commissioners of public health ; and on the same day his Majesty nominated Dr. G. P. Judd, Dr. T. C. B. Rooke, and myself… (Parke 1891:49-50).

To follow was a full-scale small pox epidemic that wiped out huge portions of the Native Hawaiian population. Kaka'ako was the location of the temporary quarantines for the disease sufferers as well as Honuakaha Cemetery that accepted its victims.

Despite the tragic outcome of the mid-19th Century epidemics, Honolulu was on the verge of becoming an island metropolis, reminiscent of American cities - only with tropical vegetation by the late 19th Century. Charles Nordhoff, the German-born American journalist, visited Honolulu in the early 1870s and commented on the fair state of the city at that time:

> It is not until you are almost within the harbor that you get a fair view of the city, which lies embowered in palms and fine tamarind-trees, with the tall fronds of the banana peering above the low-roofed houses ; and thus the tropics come after all somewhat suddenly upon you; for the land which you have skirted all the morning is by no means tropical in appearance, and the cocoa-nut groves of Waikiki will disappoint you on their first and too distant view, which gives them the insignificant appearance of tall reeds. But your first view of Honolulu, that from the ship's deck, is one of the pleasantest you can get: it is a view of gray house-tops, hidden in luxuriant green, with a background of volcanic mountains three or four thousand feet high, and an immediate foreground of smooth harbor, gay with man-of-war boats, native canoes and flags, and the wharf, with ladies in carriages, and native fruit-venders in what will seem to you brightly colored night-gowns, eager to sell you a feast of bananas and oranges. […]
>
> From the steamer you proceed to a surprisingly excellent hotel, which was built at a cost of about $120,000, and is owned by the government. You will find it a large building, affording all the conveniences of a first-class hotel in any part of the world. It is built of a concrete stone made on the spot, of which also the new Parliament House is composed; and as it has roomy, well- shaded court-yards and deep, cool piazzas, and breezy halls and good rooms, and baths and gas, and a billiard-room, you might imagine yourself in San Francisco, were it not that you drive in under the shade of cocoa-nut, tamarind, guava, and algeroba trees, and find all the doors and windows open in midwinter; and ladies and children in white sitting on the piazzas. […]
>
> Honolulu, being the capital of the kingdom, contains the government offices; and you will perhaps be surprised, as I was, to find an excellent public hospital, a reform school, and other proper and well-managed charities.…if you are

> American, and familiar with New England, it will be revealed to you that the reason why all the country looks so familiar to you is that it is really a very accurate reproduction of New England country scenery. The white frame houses with green blinds, the picket-fences whitewashed until they shine, the stone walls, the small barns, the scanty pastures, the little white frame churches scattered about, the narrow " front yards," the frequent school-houses, usually with but little shade: all New England, genuine and unadulterated; and you have only to eliminate the palms, the bananas, and other tropical vegetation, to have before you a fine bit of Vermont or the stonier parts of Massachusetts. The whole scene has no more breadth nor freedom about it than a petty New England village, but it is just as neat, trim, orderly, and silent also. There is even the same propensity to put all the household affairs under one roof which was born of a severe climate in Massachusetts, but has been brought over to these milder suns by the incorrigible Puritans who founded this bit of civilization (Nordhoff 1874:20-23).

The growth of Honolulu proper rendered the area now referred to as Kakaʻako a suitable place for industry, agriculture, working-class settlements, human and animal quarantine facilities, and ancillary activities. The eastward expansion of Honolulu into the Kakaʻako area is depicted in Figure 9.

In the early 1870s, Curtis Ward, a Kentucky born livery and draying business owner, purchased a total of 89 acres in Kewalo and Kukuluāeʻo with 3,000 feet of coastal lands (Thurman et al. 2009:34). This property, located *makai* of Thomas square spanning Kulaokahuʻa, Kewalo, and Kukuluāeʻo, would soon be known as "The Old Plantation," with nearly 30 irrigated acres of algaroba (*kiawe*) and coconut (O'Hare and Hammatt 2004:25). The Old Plantation also contained a fenced horse pasture, fishponds, taro patches, salt pans, patches of *mānienie* and *makaloa* grass, a hay field, and livestock pens for chicken, pigs, and horses (Thurman et al. 2009:34). After Curtis Ward passed away in 1882, his wife, Victoria, a descendent of *aliʻi* and European immigrants, and their seven daughters were left to run the estate for the next fifty years (Spearing et al. 2008:43-44; Thuman et al. 2009:34).

Salt production was certainly not monopolized by the Ward family in late 19th Century Kakaʻako. While the Native Hawaiian tradition of procuring salt from pans and sinks in the area now referred to as Kakaʻako has been practiced from time in memoriam to the mid-19th Century, the commercialization and mass production of salt using foreign methods replaced much of the tradition in the late 19th Century. According to Thrum (1924:116), the salt trade had its peak in 1870 and was nearly extinct by 1883.

Kakaʻako was also associated with the drama being played out in the late 19th Century between mostly Honolulu-based American businessmen and the Hawaiian monarchy, which eventually ended in the demise of the monarchy. The Hawaiian League, a secret society comprised of these American businessmen, was formed to undermine King Kalākaua's government, rendering it a constitutional monarchy headed by the Hawaiian League and Kalākaua as a simple figurehead (Kuykendall 1967:347-352). The Hawaiian League established an unofficial militia, referred to as Honolulu Rifles in 1887, which was based out of Kewalo/Kukuluāeʻo. With the added military pressure, Kalākaua buckled and signed a new constitution and

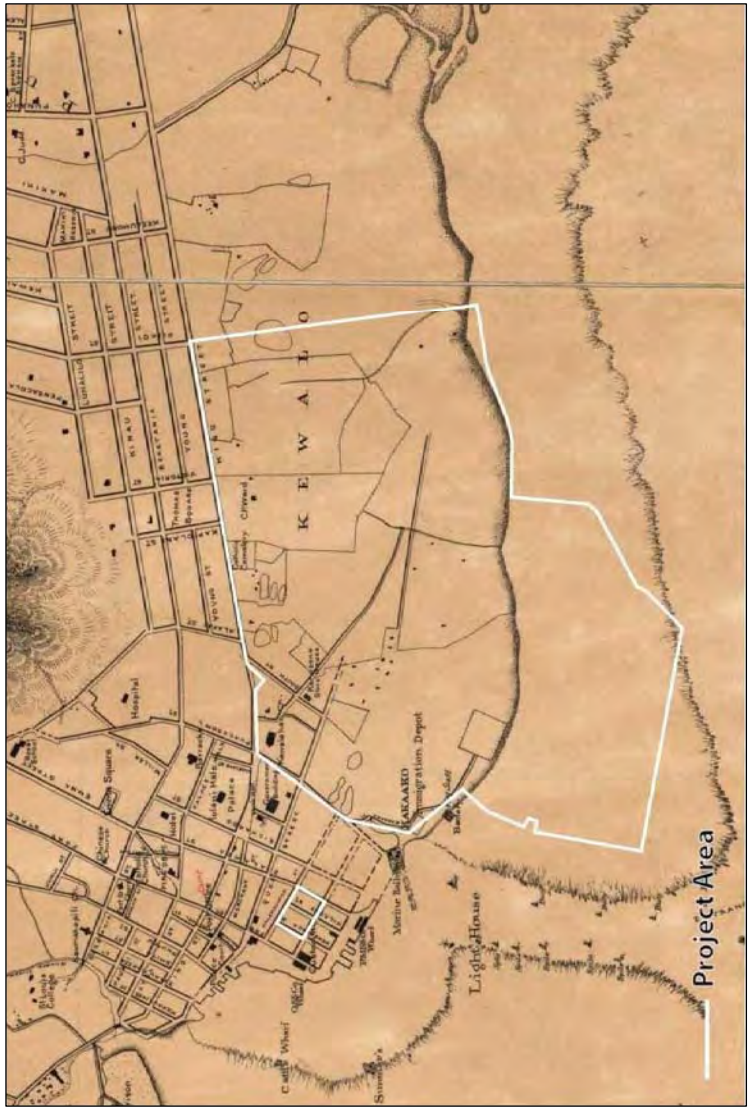


Figure 9. Portion of 1887 Wall Map of Honolulu and Vicinity with approximate project area.

discharged his cabinet, founding the Reform Government. In retaliation to the Hawaiian League's actions, supporters of the monarchy, made largely of Hawaiians and part Hawaiians, banded together to form the Kamehameha Rifle Association. Despite their efforts, the monarchy fell to the founders of the Hawaiian League.

3.2.3 Kaka'ako in the 20th Century

Kaka'ako continued to change drastically after turn-of-the-Century following the annexation of the islands in 1899 by the United States. Early 19th Century events in Kaka'ako and surrounding areas were marked by the spread of tenement housing, industry, and infrastructure as well as development on "reclaimed lands" along the coast.

As Honolulu expanded, demand for affordable housing increased, which was partially driven by the exodus of people fleeing the bubonic plague that broke out in Chinatown. To control the outbreak of bubonic plague, the tenements of Chinatown were destroyed by "controlled burning." After several successful controlled burns, the burn of 20 January 1900 was blown off the prescribe burn area, unintentionally burning 38 acres of homes and businesses and displacing nearly 6,000 Hawaiian, Japanese, and Chinese. Many of the displaced rebuilt in Chinatown, but the majority settled in tenements built by Bishop, Magoon, and Ward Estates. Joining those relocating from Chinatown were Hawaiians from rural areas and families leaving the plantations for work in Kaka'ako's industrial district, coastal fishing industries, and civic or business jobs in Honolulu. Typically, these new Kaka'ako neighborhoods were ethnically segregated out of convenience and comfort, yet socializing and commerce continued between the ethnic communities (McGregor 1989). By 1940, over 5,000 people of Hawaiian, Portuguese, Chinese, Japanese, and Filipino descent were living in Kaka'ako (Spearing et al. 2008).

However, because these tenements were built with such haste, the communities were not well planned, in terms of health and safety, and structures were substandard. As a result, a cholera outbreak occurred in 1911 as well as a trend of physical and mental deficiencies in Kaka'ako's children. Further, structures quickly became dilapidated and unfit for habitation (McGregor 1989). For a short period, many Hawaiians from Kaka'ako resettled in coastal "squatter" camps; living off the land and ocean much as their ancestors did.

Small industry was also on the rise in early 20th Century Kaka'ako, including fish processing and canning iron works, *poi* processing, flour milling, beer brewing, and brick production. According to McGreggor (1989), the population of Kaka'ako's 600 acres was over 2,500. Small businesses, such as grocery stores, restaurants, meat markets, barber shops, theatres, and specialty shops were established as the neighborhoods grew. Schools, public parks, fire and police stations, municipal buildings, a public landfill and incinerator, animal quarantine and shelter, and improved roadways also followed. In addition to commercial developments, the U.S. military installation, Fort Armstrong, was constructed on the reef of Ka'ākaukukui as part of the Coastal Defense System after the annexation of the islands by the United States in 1899 (Spearing et al. 2008: 52).

In the early 19th Century, the coast and wetlands of Kaka'ako and Waikīkī underwent dramatic changes as well. The "Reclamation" Project was, perhaps, the most transformative event in the area's history. On the face of it, the project was an undertaking to fill in mostly agricultural

ponds and wetlands that were supposedly compromising public health by acting as a breeding ground for disease bearing mosquitoes. However, according to Nakamura (1979), this project served to generate capital for Hawaiian construction companies while increasing residential land and land value as well as gentrifying the area by forcing out farmers and underprivileged families. This decade-long project not only transformed the coastlines of Kaka'ako and Waikīkī, but altered the ecology and cultural landscape forever. While most of the coast was extended makai, Kewalo Basin was dredged to expand the small harbor for the lumber industry, which soon gave way for the fishing industry (Spearing et al. 2008).

3.3 The Archaeological Record

Several cultural and archaeological studies performed within and adjacent to the Kaka'ako TOD Overlay project area have compiled all archaeological investigations and findings for this area (O'Hare and Hammatt 2004; Spearing et al. 2008; Thurman et al. 2009; Genz and Hammatt 2010; Vogeler et al. 2010; Hammatt 2013). Based on the above reports, a total of 87 archaeological investigations have been performed within or adjacent to the project area. A total of 48 new archaeological sites were discovered in these investigations. Human remains, including pre-and post Contact Native Hawaiian burials as well as Historic era non-Hawaiian burials, have been ubiquitous throughout the project area, totaling nearly 500 individuals (MNI=493) between all previous archaeological investigations. Maps for all archaeological investigations, archaeological sites, and human burials can be found in each respective report and are provided in Appendix C. Table 2 provides a list of archaeological investigations performed in the project area as well as archaeological sites found during these investigations based upon O'Hare and Hammatt (2004), Spearing et al. (2008), Genz and Hammatt (2010), Vogeler et al. (2010), Elison and McElroy (2011), and Hammatt (2013).

Table 2. Previous Archaeological Work in the Kaka'ako TOD Overlay Project Area

Author	SIHP No. 50-80-14	No. of Burials	Report Description and Findings
Pearson 1980, 1995	-9991		Test pits were excavated near the Mission Houses (-9991); 19th and 20th century artifacts were recovered.
Ota & Kam 1982	-2963	6	Osteological Study, Makai Parking Garage, corner of Punchbowl and Halekauwila Streets (TMK 2-1-31:23) - Six partial burial sets (SIHP #50-80-14-2963) found. Tooth evulsion indicates probable pre-Contact to 1850 date.
Yent 1985	-2918	5	Ka'ākaukukui Cemetery (-2918) at the Honolulu Iron Works project area - Five burials (SIHP #50-80-14- 2918) recorded
Athens 1986	-1973		Monitoring of Judiciary Parking Lot - Historic deposits (SIHP #50-80-14-1973) with artifacts dating late nineteenth to early twentieth centuries
Clark 1987	-2963	7	Archaeological monitoring at Makai Parking Garage, corner of Punchbowl and Halekauwila Streets (TMK 2-1-31:23) - One cultural resource identified: SIHP #50-80-14-2963; seven burials probably dating to pre - 1850
Griffin et al. 1987	-2918	3	Background research and predictive models; reports on an additional 3 burials at Ka'ākaukukui Cemetery (-2918).

Author	SIHP No. 50-80-14	No. of Burials	Report Description and Findings
Davis et al. 1988			During monitoring at the Honolulu Iron Works site, no additional human burials were found in the area surrounding Kaʻākaukukui Cemetery (site -2918).
Leidemann 1988	-1973		Monitoring at Federal Building parking lot - Historic deposits (SIHP #50-80-14-1973) found
Smith 1989	-4243	1	Kamakeʻe to Keʻeaumoku – one human bone found
Bordner 1990	-9991		Test trenches were excavated in the Kawaiahaʻo Church grounds (-9991); Some historic artifacts were recovered.
Douglas 1991a	-4380	8	Coral and Queen Street area: 8 burials (-4380) recorded and 5 disinterred.
Douglas 1991b	-4380	1	Coral and Queen Street area: 1 burial recorded (-4380).
Kawachi 1991	-1604	2	Monitoring at the Queen Emmalina Tower project; 1 human skull and 1 femur (-1604) were found in the back dirt pile
Schilz 1991	-1604	2	Background research and property assessment of Queen Emmalina Tower project, a block formerly used for kerosene storage and for tenements (Magoon Block); in subsequent projects, human remains were found and designated site -1604.
Chiogioji & Hammatt 1992	N/A		Archaeological background research and brief surface field inspection at former lot of Kapiʻolani Community College adjacent to McKinley High School (site -9926). No findings.
Avery & Kennedy 1993a	-3712	3	Monitoring at 1853-1854 Honuakaha Smallpox Cemetery; 3 historic burials recorded.
Avery & Kennedy 1993b	-3712	6	Monitoring of South St. Building Complex, 6 burials associated with 1853-1854 Honuakaha Smallpox Cemetery were found.
Denham & Kennedy 1993	-4605 -4606	1	Archaeological monitoring for the State Capitol Complex Telecommunications Conduits Project documented two cultural resources: SIHP #50-80-14-4606, a multi-component site consisting of a human burial, historic trash pit, firepit, and 6 postholes, and SIHP #50-80-14-4606 consisting of 9 historic trash pits
Hammatt 1993	-3712 -9917	31	Subsurface Inventory Survey; found 31 burial pits from the1853 -1854 Honuakaha Smallpox Cemetery (-3712) and 3 refuse pits associated with the Honolulu Brewing Co. (-9917)
Hammatt and Pfeffer 1993	-3712	29	Archaeological inventory survey at the American Brewery lot – identified 29 burial pits associated with the Honuakaha Cemetery (SIHP #50-80-14-3712) and 3 refuse pits associated with the brewery
Miyasaki and Ogata 1993	-9917		Environmental site assessment of the American Brewery Co. building (site -9917). No field work.
Pfeffer, Borthwick, & Hammatt 1993	-3712 -4531 -4532 -4533 -4534	31 1 1 116	Monitoring for Kakaʻako ID-1 - 31 burials from 1853-1854 Honuakaha Smallpox Cemetery (SIHP #50-80-14-3712/-4531) at Quinn Lane; one historic burial from Punchbowl St. (SIHP #50-80-14-4532); one possibly pre-Contact burial from Halekauwila St. (SIHP #50-80-14-4533); and 116 historic burials from Kawaiahaʻo Cemetery (SIHP #50-80-14-4534) at Queen St. (used from 1825-1920)

Author	SIHP No. 50-80-14	No. of Burials	Report Description and Findings
Athens et al. 1994	-4847	1	Wetland environment on Kapi'olani and Pi'ikoi Sts.; 1 human burial (-4847) recorded.
Heidel & Hammatt 1994	-1346		Background research on the Kakaʻako Fire Station building and lot (-1346). No field work.
Anderson 1995, 1997a, 1997b	-5373	30	Three reports on One Archer Lane project area (inventory survey, monitoring and burial disinterment); minimum of 30 historic human burials (-5373) recorded along western side of the Roman Catholic Cemetery on King St.
Hammatt & Chiogioji 1995	N/A		Archaeological assessment of 20 parcels and background research; No field work conducted.
Kapeliela 1996	-5455	1	Burial find; 1 historic human burial (-5455) found on west side of Roman Catholic Church on King St.
Winieski et al. 1996	-3712	25	Archaeological monitoring as well as disinterment of 25 sets of human remains (SIHP #50-80-14-3712) at the Honuakaha Housing Project (Honolulu Brewery site). Monitoring documented historic artifacts ranging from the 1880s to the turn of the 20th century. Eleven previously identified and 14 inadvertent find of human remains were disinterred and reinterred on the property.
Allen 1997	N/A		Monitoring of geotechnical coring in Symphony Park; no site designations made.
Hammatt & Chiogioji 1998	-1388		Archaeological Assessment of area that includes Mother Waldron Neighborhood Park playground (-1388) and Pohukaina Elementary School. No field work.
Sinoto2000	N/A		Wal-Mart/Sam's Club Development Area: Archaeological Assessment with recommendation for Archaeological Monitoring
Winieski & Hammatt 2000a	-1388 -4380 -5820	9 11	Archaeological monitoring at the Kakaʻako Improvement District 3 area - 20 human burials were encountered. Nine burials were discovered at the Pohulani Elderly Rental Housing (SIHP #50-80-14-4380), and 11 were in and around Mother Waldron Neighborhood Park (SIHP #50-80-14-5820).
Winieski & Hammatt 2000b	-5598	2	Monitoring for Kakaʻako Improvement District 4 construction - Two isolated historic coffin burials (SIHP #50-80-14-5598) were documented on Kamakeʻe Street, between the intersections of Kawaiahaʻo and Waimanu Streets.
Winieski & Hammatt 2001a	-5942		Archaeological monitoring along Nimitz Highway, Queen Street, and Ala Moana Boulevard which documented historic trash within fill, a brick alignment, a brick lined manhole, and the remains of a light gauge rail associated with the historic Honolulu Rapid Transit System, SIHP #50-80-14-5942
Winieski & Hammatt 2001b	N/A		Archaeological monitoring of boring at the Kakaʻako Fire Station. No cultural material or human remains were observed.
Winieski & Hammatt 2001c	N/A		Archaeological monitoring at the Ward Village Phase II project (Ward Theatres documented pockets of a sandy loam buried A-horizon – no archaeological cultural resources were identified
Bush & Hammatt 2002	N/A		Kakaʻako ID-10: Monitoring Plan

Author	SIHP No. 50-80-14	No. of Burials	Report Description and Findings
Mann & Hammatt 2002	-6371	1	Monitoring for King St. Alignment; 1 burial (-6731) found, possibly post-Contact due to presence of historic artifact.
Sinoto & Pantaleo 2002	N/A		Wal-Mart/Sam's Club Development Area: Monitoring Plan
Souza, Perzinski, & Hammatt 2002	-6376 -6377 -6378		Kakaʻako Improvement District 7 Monitoring - Three burials encountered: SIHP #50-80-14-6376, SIHP #50-80-14-6377, and SIHP #50-80-14-6378
O'Hare et al. 2003	-6636 -6637		Inventory survey at the corner of Piʻikoi St. and Kapiʻolani Blvd. – documented 4 features consisting of 2 historic trash pits, a pit containing ceramic insulators, and an artificially constructed sand berm with a possible coral retaining wall and a wooden fence post. The sand berm feature was designated part of SIHP #50-80-14-6636. one historic trash pit (site-6637) reported.
Le Suer and Cleghorn 2004	N/A		Archaeological assessment (no fieldwork) for East Oʻahu Transmission Project; King St.
O'Hare et al. 2004	-6636 -6639 -6641		Archaeological inventory survey for the Koʻolani Condominium Project; Original wetland surface of Kewalo (-site 6636) and three historic trash pits (sites -6639, -6641) reported.
O'Hare, Bush, Borthwick, & Hammatt 2004	-6639 -6641 -6636		Inventory survey Koʻolani Condominium – Three cultural resources documented: SIHP #50-80-14-6639 and SIHP #50-80-14-6641, historic trash pits dating from the early twentieth century; and SIHP #50-80-14- 6636, the original wetland surface of Kewalo
O'Leary & Hammatt 2004	N/A		Monitoring for Unit 9 streets; no cultural remains found.
Perzinski & Hammatt 2004	N/A		Monitoring of geotechnical borings at the Kakaʻako Fire Station, no cultural material was found in 12 test trenches.
Clark & Gosser 2005	-6636		Subsurface inventory survey of TMK 2-3-003:075, 085, 086. Previously described wetland area recorded (-6636).
Cordy and Hammatt 2005	N/A		Archaeological monitoring Punchbowl St. - No historic properties identified; observed stratigraphy generally consisted of historic and modern fill material overlying naturally deposited sediment layers (Jaucas sand or black cinder).
Monahan 2005	N/A		Assessment of three parcels in Kewalo; no cultural materials found in nine trenches.
Tulchin, T. & Hammatt 2005	-6636 -6641		Inventory survey Phase II portion of the Koʻolani Condominium parcel - Two cultural resources identified: SIHP #50-80-14-6636, original wetland surface of Kewalo area; and SIHP #50-80-14-6641, historic garbage layer—both previously identified by O'Hare et al. (2004)

Author	SIHP No. 50-80-14	No. of Burials	Report Description and Findings
Bell et al. 2006	-6854 -6855 -6856	5 6	Archaeological inventory survey for Victoria Ward Village Shops – Three cultural resources identified: SIHP #50-80-14-6854, subsurface cultural layer containing both historic and prehistoric cultural material and five human burials; SIHP #50-80-14-6855, pre-Contact traditional Hawaiian cultural layer with six human burials; and SIHP #50-80-14-6856, historic fishpond remnant
Bush & Hammatt 2006	N/A		Monitoring for Hokua Tower Project; no cultural remains found.
Esh & Hammatt 2006	N/A		Monitoring of Unit 5 B Streets; no cultural materials found.
Gosser et al. 2006	N/A		Monitoring at the corner of Kapiʻolani Blvd. and Kamakeʻe St. documented no finds
Hammatt 2006a	N/A		Kapiʻolani Blvd. field inspection; no surface historic properties were observed
Hammatt 2006b	-6847		Archaeological inventory survey; one feature, a wooden box containing historic artifacts (Site - 6847)
O'Hare et al. 2006	-6658 -6659 -6660	28 2	Queen Street Extension Project; monitoring at Kakaʻako ID-10; cluster of 28 historic burials (-6658), 2 isolated burials (-6659), and a historic trash dump (-6660) were recorded.
Oʻ Leary & Hammatt 2006	N/A		Archaeological inventory survey for the Moana Vista project area; no cultural materials found.
Perzinski et al. 2006	-5455	2	Kewalo HECO Dispatch Center 6 trenches and 9 pile caps excavated; 2 human burials recorded (Site -5455)
Barnes & Shideler 2007	N/A		No surface features found during a field inspection. Background research indicated the possibility of subsurface burials
Hammatt 2007	-6910 -6911 -6912	16 2	Monitoring at Koʻolani Condominium; 2 isolated burials (-6910, -6912) and cluster of 16 coffin burials (-6911) found.
Hazlett et al. 2007a	-1604	2	Monitoring at Queen Emmalani project; 2 human skeletal elements found and recorded as part of site -1604.
Hazlett et al. 2007b	-6637		Monitoring at Moana Pacific property; historic deposit recorded (-6637).
O'Hare et al. 2007	-6901 -6902	3	Alapai Transit Center 28 trenches excavated; 4 trash pits (Site -6901) and 3 burials (Site -6902) discovered
Stein et al. 2007	N/A		Monitoring for the Kakaʻako Fire Station renovation – no cultural resources were identified
Carney and Hammatt 2008	-6765	1	Archaeological monitoring of the Hokua Tower Project which identified 2 historic properties: SIHP #50-80-14-6765, an isolated fragment of a human mandible, and a historic trash pit
Hammatt 2008	-6910 -6911 -6912		Monitoring associated with the development of the Koʻolani Towers Phase I - Three cultural resources identified: SIHP #50-80-14-6910, a single pre-Contact burial; SIHP #50-80-14-6911, a cluster of 16 historic coffin burials; and SIHP #50-80-14-6912, a single burial

Author	SIHP No. 50-80-14	No. of Burials	Report Description and Findings
Hazlett and Hammatt 2008	N/A		Archaeological monitoring at the intersections of Alakea and Merchant Streets and Alakea and Queen Streets. No historic properties were identified.
Hazlett, Fehrenbach, and Hammatt 2008	N/A		Archaeological monitoring for water main installation on Aloha Tower Drive - no cultural resources were encountered during project construction; observed stratigraphy consisted entirely of fill associated with modern road and utility construction, as well as historic land filling activities, associated with the expansion of Honolulu Harbor.
Hazlett, Loynaz, and McDermott 2008	N/A		Monitoring of the Ala Moana expansion project - No historic properties encountered
Petrey et al. 2009	N/A		Archaeological monitoring for resurfacing of portions of Nimitz Highway and Ala Moana Boulevard, installation of streetlights, replacement of concrete bus pads, and limited drainage installation. No archaeological cultural resources were documented.
Fong, Borthwick, & Hammatt 2009	N/A		Monitoring of Kapiʻolani Boulevard Drainage, Water, and Sewer Systems Improvements - No cultural resources observed
O'Hare, Tulchin, T., Borthwick, & Hammatt 2009	N/A		Archaeological inventory survey plan for three Kamehameha Schools Kakaʻako Mauka parcels including Civic Center Transit Center location - Preliminary testing identified extensive fill layers overlying naturally deposited sandy clay and marsh/pond sediments. No cultural resources identified
Pammer et al. 2009	-6901		Alapai Transit Center 15 test trenches excavated; 3 additional historic trash pits observed (Site -6901)
Thurman, Altizer, O'Hare, Shideler, & Hammatt 2009	-6856		Archaeological inventory survey for Queen Street parks project - One previously identified cultural resources: SIHP #50-80-14-6856, a historic fishpond remnant, originally identified by Bell et al. (2006)
Tulchin, T. Altizer, Borthwick, & Hammatt 2009	N/A		Archaeological assessment of the proposed Halekauwila Place Project - No cultural resources identified. The stratigraphy observed within the subject parcel generally consisted of three to five layers of historic and modern fill material overlying naturally deposited sediment layers (sandy clay and gleyed clay sediments typical of a wet, marsh-type environment).
McElroy 2010	-6516 -6661 -6662	64	This after-the-fact archaeological monitoring report documents human remains (MNI = 64) found in six areas, assigned SIHP #s 50-80-14-6516, -6661, and -6662. Both pre-Contact and post-Contact burials
Pammer & Hammatt 2010a	N/A		Archaeological assessment - No cultural resources were identified within the 4.7-acre project area. The project area was observed to have undergone extensive land modification by the filling of the low lying areas of Kakaʻako.
Pammer & Hammatt 2010b	N/A		Archaeological assessment for an approximately 0.26-acre Moana Vista project on Kapiʻolani Boulevard - No cultural resources identified

Author	SIHP No. 50-80-14	No. of Burials	Report Description and Findings
Altizer et al. 2011	-6636		This archaeological monitoring report for the Kapiʻolani area revised sewer system documented SIHP #50-30-14-6636, a wetland deposit, in Sewer Line G, near Kamaile Street, far from the present project area.
Pammer, Fong, & Hammatt 2011	-7124 -7189 -7190 -7197		A total of four cultural resources were identified within the project area: SIHP #50-80-14-7124, -7189, -7190 and -7197. SIHP #50-80-14-7124 consists of 31 historic building remnants features (Features A – EE), generally located just beneath the modern layers of fill. SIHP #50-80-14-7189 consists of a layer of burnt historic debris, suspected to be from the open air burning of urban refuse during the early 1900s. SIHP #50-80-14-7190 consists of old salt pan remnants, presenting as an approximately 5 cm thick layer of alternating peat and clay striations. SIHP #50-80-14-7197 consists of a sandy cultural layer containing one late pre-Contact/early post-Contact fire pit feature.
Runyon, Thurman, O'Hare, Borthwick, & Hammatt 2011	-6636 -6641 -7115 -7116 -7117	27	Five cultural resources are significant based on Hawaiʻi Register* criteria: SIHP #50-80-14-6641, a burnt historic trash layer, was previously evaluated and determined significant under criteria A and D; SIHP #50-80-14-6636, Kewalo wetland sediment, was previously evaluated and determined significant under criteria A and D; SIHP #50-80-14-7115, a subsurface cultural layer containing intact pit features and artifacts is significant based on criteria A, D, and E; SIHP #50-80-14-7116, a buried low-energy alluvial layer, is significant based on criteria A and D; SIHP #50-80-14–7117, based on available archaeological information, is a concentration of post-Contact human burials, the majority of which are in an extended burial posture and located in coffins. All 27 burials were documented in pits extending down from the overlying buried, culturally-enriched A-horizon (SIHP #-7115).
Yamauchi et al. 2011	N/A		Archaeological monitoring for the Queen and Kamakeʻe traffic signal project - no cultural resources were identified
Burke and Hammatt 2012	7193		1391 Kapiʻolani Boulevard Parcel - archaeological inventory survey for a 1391 Kapiʻolani Boulevard parcel involving 22 test excavations. SIHP #50-80-14-7193, a historic trash layer dating from the 1930s to the 1950s, was documented.
Runyon, Borthwick, and Hammatt 2012	-6636		Archaeological Inventory Survey Report for the Senior Residence at Piʻikoi. SIHP #50-80-14-6636 consists of buried Kewalo wetland sediments, found in all test trenches in the project area. The site has been previously documented in nearby areas in Kakaʻako (O'Hare et al. 2003, O'Hare et al. 2004, Tulchin, T. and Hammatt 2005, and Runyon et al. 2011).
Sroat and McDermott 2012	-6855		This supplemental archaeological inventory survey report for the Ward Village Shops Phase 2 project identified no new cultural resources. Further documentation of SIHP 50-80-14-6855 was conducted
Dagher and Spear 2013 (draft)	-7260	1	This burial site component of a data recovery plan for State Site 50-890-14-7260 addresses the inadvertent find of a partial set of displaced human skeletal remains at the east corner of Halekauwila Street and Cooke Street.
Morriss, Hunkin, and McDermott 2013 (draft)	-6636		Archaeological inventory survey for the Ala Moana Center ʻEwa Mall Expansion Project. Identified SIHP #50-80-14-6636, buried Kewalo wetland sediments, and possible salt pan remnants (however further investigation was deemed necessary to confirm).

3.4 Iwi Kūpuna

The Kaka'ako TOD Overlay project area is situated in a region that has a relatively high human burial density, with a total of nearly 500 individuals encountered by inadvertent discovery (MNI=493; Table 2). *Iwi kūpuna* are the ancestral skeletal remains of Native Hawaiians. Yet, the term may be applied to the ancestral remains of non-Hawaiians that are also found in Kaka'ako, such as those who perished in the Historic era small pox epidemic. These remains are highly revered by contemporary Hawaiians and other individuals share these beliefs. In the Native Hawaiaan belief system, it is largely believed that, upon death, the *nā iwi* of a person become the repository of the *mana* (power, authority) they possessed in life. The method of traditional Hawaiian burials varied with an individual's social status as well as the customs of the area that they lived and constraints dictated by the area's topography and soil makeup. Coastal properties, especially where there are areas of sand, were common grounds for Native Hawaiian burials. Traditionally, the *kuleana* (responsibility, privilege) of caring for *nā iwi* was a sacred task. In general, Native Hawaiians strongly believe that *iwi kūpuna* should not be disturbed and rest in the original place of burial.

The proper treatment of *iwi kūpuna* has not always been enforced, as a Burial Treatment Plan (BTP) was not required by law until the late 1980s, and the treatment of *iwi kūpuna* was discretionary until that time. Traditionally, the *kuleana* (responsibility) to *mālama* (take care of) the *iwi kūpuna* was in the hands of the descendents and/or the *konohiki*. In accord with these traditional values, burial councils were formed for every island in the state. The O'ahu Island Burial Council (OIBC), which meets once a month, is comprised of community members appointed by the Governor of Hawai'i and confirmed by the Senate to serve a four-year term. No member can serve more than two consecutive terms. According to the Department of Land and Natural Resources (DLNR) Burial Sites Program, the rules regarding inadvertent discoveries are summarized as follows:

> Anyone who wishes to relocate, or preserve in place, previously identified, Hawaiian burials over 50 years old must obtain the approval of the appropriate Island Burial Council, which meets on a monthly basis on its respective islands.
>
> Any skeletal remains accidentally discovered must be reported to the Historic Preservation Division and County police. If burial remains are estimated to be less than 50 years old, they fall under the jurisdiction of the local police.
>
> The division currently responds to approximately 2-3 inadvertent discoveries each week, and is involved in up to 250 burial cases annually. Since 1991, approximately 3,000 sets of native Hawaiian skeletal remains have been re-interred thanks to the collaborative efforts of the division, various Hawaiian organizations, and property owners (DLNR 2013).

As the Kaka'ako area is known to have a high density *of iwi kūpuna* and the human remains of other ethnic groups, conscientiousness to this fact in planning development in the area is crucial. Proper preventative measures, such as thorough cultural and archaeological investigations, should be employed prior to planning developments in the area. Further, inadvertent discovery protocols must be strictly followed by developers.

It is important to note that despite the fact that pre-Contact and Historic era human burials are ubiquitous in Kaka'ako, the potential for encountering iwi kūpuna dramatically decreases for "reclaimed" lands that were essentially under water prior to European Contact. Figure 10 provides a NRCS based soil map of the project area with estimated original shoreline as indicated on Historic maps (still adding maps).

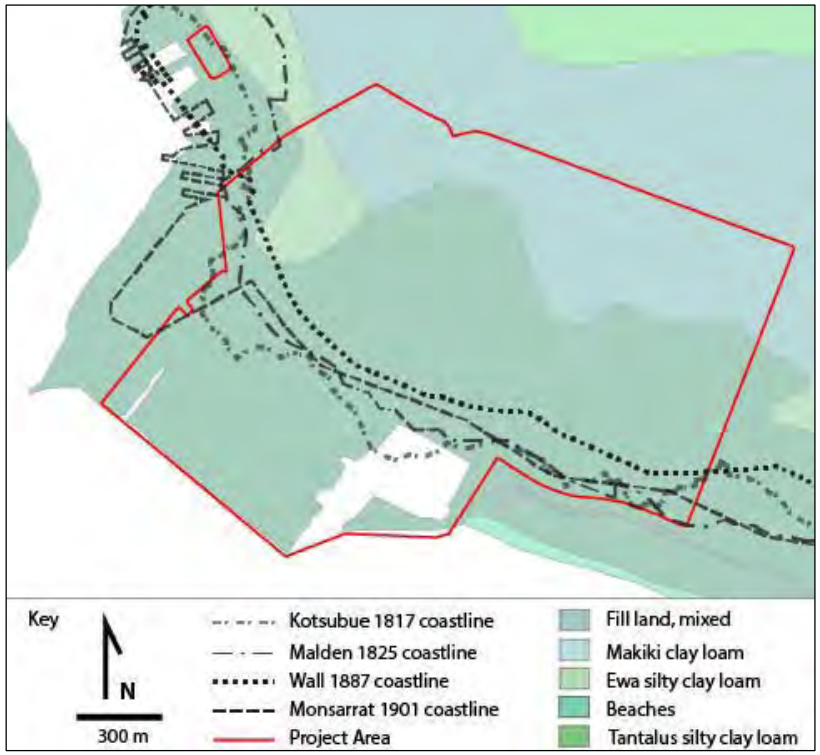


Figure 10. Map Af Kaka'Ako Soils with Historic Map Coastline Depictions Overlayed.

4.0 PREVIOUSLY PERFORMED CULTURAL STUDIES FOR KAKAʻAKO

This review focuses on two ethno-historical investigations, five CIA, and one Traditional Cultural Property (TCP) study that were performed within the Kakaʻako TOD Overlay project area. The subject area consists of KCDD lands comprised of 601.6 acres bounded by King Street to the north, Piʻikoi Street to the east, Ala Moana to the southeast, Māmala Bay to the south, Pier 1 to the southwest, and Punchbowl Street to the west, as well as the Aloha Tower Special District comprised of 3.4 acres bounded by South Nimitz Highway to the north, Richard Street to the east, Aloha Tower Drive to the south, and Bishop Street to the west (Figure 1).

4.1 PREVIOUS ETHNO-HISTORICAL INVESTIGATIONS

Two ethno-historical investigations were performed for areas that incorporate the current project area (University of Hawaiʻi 1978; McElroy et al. 2008).

4.1.1University of Hawaiʻi Ethnic Studies Department Oral History Project

In 1978, the University of Hawaiʻi published a two-volume ethnographic study for the Kakaʻako area, titled: *Remembering Kakaʻako, 1910-1950* (University of Hawaiʻi 1978). In reaction to the increased development of Kakaʻako, 29 individuals hailing from Kakaʻako were interviewed to elucidate what life was like from the early to mid-20th Century for its inhabitants. Interviewees represented a broad cross-section of Kakaʻako who were ethnically diverse and predominantly working class. The general finding from this study was that the Kakaʻako of the interviewees' memories was rapidly disappearing as residential areas became urban and industrial (Spearing et al. 2008).

4.1.2 Kamehameha Schools Ethno-Historical Inventory Study

An Ethno-Historical Inventory Study was performed in 2008 by Garcia and Associates for 47 parcels on 51.3 acres in Kakaʻako owned by Kamehameha Schools (McElroy et al. 2008). This study included four interviews with long-time Kakaʻako community members as well as a compilation of Historic maps, photographs, Hawaiian and English news articles, and other archival materials. Spearing et al. (2008:69-72) provides numerous excerpts from the McElroy et al. (2008) report that relate to the Kakaʻako Mauka area. The findings of McElroy et al. (2008) echoed those of the University of Hawaiʻi (1978), where Kakaʻako had dramatically changed from a fishing village to the metropolis we currently recognize (McElroy et al. 2008). Further, the interviews resulted in diminutive information on traditional Native Hawaiian cultural practices in the area or *moʻolelo* regarding Kakaʻako (McElroy et al. 2008).

4.2 PREVIOUS CULTURAL IMPACT ASSESSMENTS

Between 2002 and 2011, several CIAs in the Kakaʻako TOD Overlay project area were conducted. Much of the subject area was covered in the previously conducted CIAs. Therefore, a Supplemental CIA (SCIA) was determined to sufficiently assess cultural impacts for the Kakaʻako area. Five CIAs covering the Kakaʻako TOD project area were reviewed for the SCIA consist of:

- Wilson Okamoto and Associates, Inc.
  2002 Cultural Impact Assessment in the Final Environmental Assessment University of Hawaii Health and Wellness Center. Prepared for the University of Hawaii, John A. Burns School of Medicine. Prepared by Wilson Okamoto and Associates, Inc.

- Spearing, Mishalla, Constance O'Hare, and Hallett H. Hammatt
  2008 Cultural Impact Assessment for the Kakaʻako Community Development District Mauka Area Plan, Waikīkī Ahupuaʻa, Honolulu (Kona) District, Oʻahu Island. TMK: [1] 2-1-29-32, 44, 46-56 and 2-3-01-11. Prepared by Cultural Surveys Hawaiʻi, Inc.

- Vogeler, Kuhio, Lehua Kauhane, and Hallet H. Hammatt
  2010 Cultural Impact Assessment for the Proposed McKinley High School Athletic Complex Master Plan Project, Honolulu (Kewalo) Ahupuaʻa, Honolulu District (Kona Moku), Island of Oʻahu. TMK: [1] 2-3-009:001 por. Prepared by Cultural Surveys Hawaiʻi, Inc.

- Genz, Joseph H. and Hallett H. Hammatt
  2010 Cultural Impact Assessment for the Kewalo Basin Repairs Project, Kakaʻako Ahupuaʻa, Honolulu (Kona District), Oʻahu. TMK: [1] 2-1-058. Prepared by Cultural Surveys Hawaiʻi, Inc.

- Elison, Mina and Windy K. McElroy
  2011 Final – Cultural Impact Assessment for Kakaʻako, Ahupuaʻa of Waikīkī, Kona District, Island of Oʻahu, Hawaiʻi. TMK: [1] 2-3-006:017. Prepared by Keala Pono Archaeological Consulting, LLC.

The project area covered by Wilson Okamoto and Associates, Inc. (2002) is on two parcels, totaling 9.9 acres, bound by Kakaʻako Waterfront Park to the south, Ilalo Street to the north, Fort Armstrong Street to the west, and Cooke Street and Kakaʻako Makai Gateway Park to the east (Figure 11). Spearing et al. (2008) covers The Kakaʻako Community Development District Mauka Area, which is bound by King Street to the north, Piʻikoi Street to the east, Ala Moana Boulevard to the South, and Punchbowl Street to the south (Figure 12). The project area covered by Vogeler et al. (2010:17) "…is a portion of the present McKinley High School campus, located north-east of Kapiʻolani Boulevard and between the Neal Blaisdell Exhibition Center on the west and Pensacola Street on the east" (Figure 13). While the CIA prepared for McKinley High School (Vogeler et al. 2010) was focused on a property within the Kakaʻako Community Development District Mauka Area, which is the subject location for the CIA prepared by Spearing et al. (2008), additional cultural resources were identified by Spearing et al. (2008), as it was conducted more recently. Thus, both will be included in this review. The Genz and Hammatt (2010) CIA focuses on the Kewalo Basin, which is comprised of 22 marine acres of the mixed-use harbor, including the immediately adjacent "reclaimed " lands (Figure 14). Elison and McElroy (2011) covers the 1.73 acre parcel bound by Waimanu Street to the north, Piʻikoi Street to the east, Ala Moana Boulevard to the south, and Kamakeʻe Street to the west (Figure 15).

Figure 11. 1998 Honolulu Quadrangle U.S. Geological Survey 7.5-minute topographic map showing Wilson Okamoto and Associates, Inc. project area location.

Figure 12. 1998 Honolulu Quadrangle USGS 7.5-minute topographic map depicting Kaka'ako Community Development Mauka Area District (Spearing et al. 2008: Figure 1).

Figure 13. 1998 Honolulu Quadrangle U.S. Geological Survey 7.5-minute topographic map showing project area location (Vogeler et al. 2010: Figure 1).

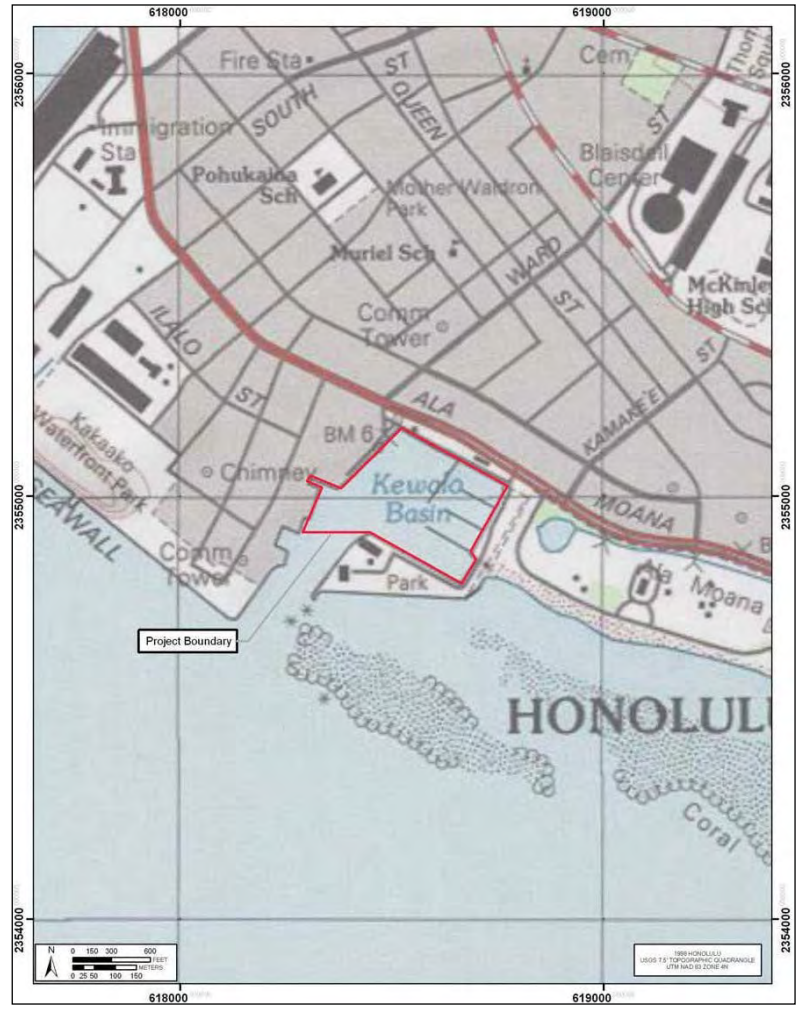


Figure 14. 1998 Honolulu Quadrangle USGS 7.5-minute topographic map depicting Kewalo Basin Repairs Project Area (Genz & Hammatt 2010: Figure 3).

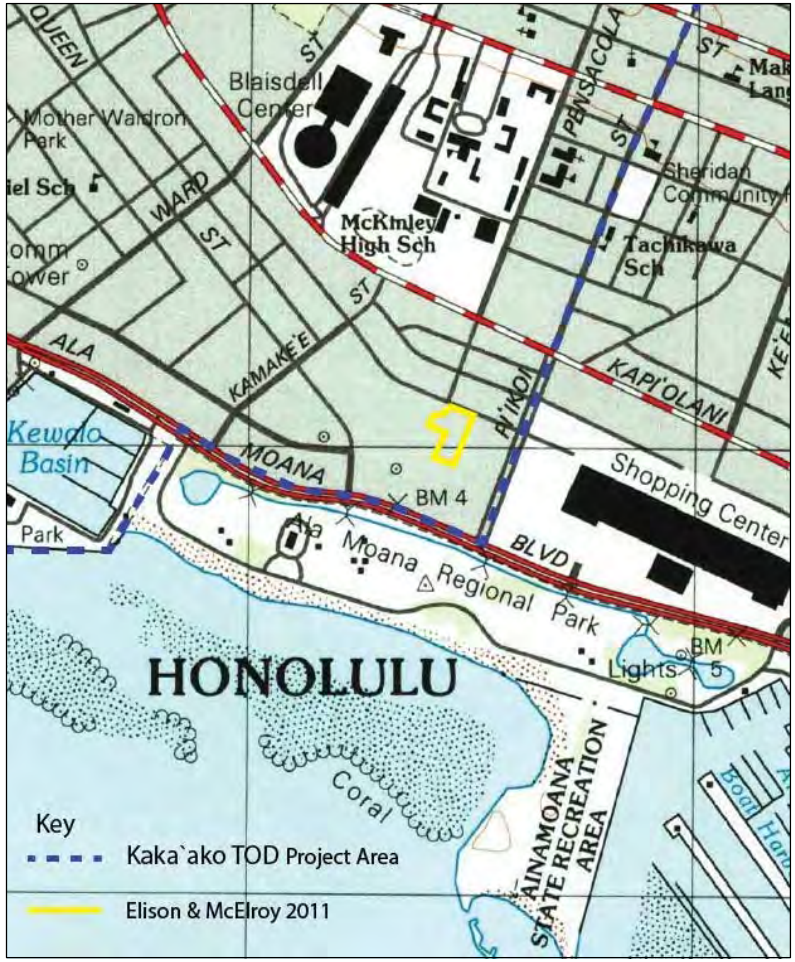


Figure 15. 1998 Honolulu Quadrangle U.S. Geological Survey 7.5-minute topographic map showing Elison and McElroy (2011) project area location.

4.2.1 Errors, Inconsistencies, & Ambiguities in Previous CIAs

The reviewed CIAs were checked for major errors, inconsistencies, and ambiguities. While most reviewed CIA were well researched and written, the scope of each report was limited to the project area's boundaries. According to the 1997 OEQC *Guidelines for Assessing Cultural Impacts*, "In scoping the cultural portion of an environmental assessment, the geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment" (OEQC 1997:1). Areas adjacent to the project areas for each CIA study were not addressed in these studies. Each of the CIA studies were limited to the confines of the defined project area, which is not in accordance with the *Guidelines for Assessing Cultural Impacts* (OEQC 1997).

Wilson Okamoto and Associates, Inc. (2002) minimally performed research to summarize the ethnographic and historical background of its project area. While a two page summary was written for the archival research section, only one reference was cited (Clark 1977) and two Historic maps (Bishop 1884; Wall 1911) were presented. Overall, information provided in the background summary was accurate albeit a minimal effort and far from complete. Table 1 provides the key findings of Wilson Okamoto and Associates, Inc. (2002).

By and large, the background research results of Spearing et al. (2008) reflect thorough archival research methods as suggested by the 1997 OEQC *Guidelines for Assessing Cultural Impacts* and a diligent attempt to summarize the project area's cultural landscape from the pre-European Contact era into the Historic (Table 2). Yet, the *ahupuaʻa* designation –listed in this CIA as Waikīkī - should be clear and consistent with the report's text and maps. If the archival record is unclear, this should be further researched and an explanation as to why the project area was assigned to the *ahupuaʻa* of Waikīkī.

Overall, the results of background research in Vogeler et al. (2010) were very thorough and reflect a good faith effort to satisfy the 1997 OEQC *Guidelines for Assessing Cultural Impacts* as well as Act 50, SLH 2000 (Table 3). Some clarification of the *ahupuaʻa* designation is warranted.

The background research in Genz and Hammatt (2010) appears comprehensive and in accord with the OEQC *Guidelines for Assessing Cultural Impacts* (Table 4). Sections 3 and 4 of the report, which focus on the Traditional and Historical backgrounds, were exceptionally written, however, the Results of Background Research (Section 10.1 and Management Summary) contained a high frequency of repetition as well as disjointed and overlapping themes. The section could be better organized and simplified.

Elison and McElroy (2011) provided results of thorough background research. The background section, which presents numerous Traditional Hawaiian accounts as well as a large compilation of Historic documentation. The report was well-written and appears to exceed the *Guidelines for Assessing Cultural Impacts* (OEQC 1997) requirements. Table 5 provides the key background findings of Elison and McElroy (2011).

4.2.2 Results of Background Research

Generally, all of the CIAs for Kaka'ako exhibited thorough background sections, with the exception of Wilson Okamoto and Associates, Inc. (2002). Wilson Okamoto and Associates, Inc. (2002) simply summarizes the results of background research in the body of the CIA with a single reference cited (Clark 1977) and two Historic maps (Bishop 1884 and Wall 1911) provided as figures. The results of all Cultural Surveys Hawai'i, Inc., CIAs are listed in the Management Summary Sections of each report, as is the standard for Cultural Surveys Hawai'i reports. Elison and McElroy (2011) also summarize the background in the body of the report, providing the results of very thorough research. Tables 3-7 list the results of each report's background research.

Table 3. Wilson Okamoto and Associates, Inc. (2002) Results of Background Research

Wilson Okamoto and Associates, Inc. **(2010:iv-vii)**
1. Traditional name of general location that the University of Hawai'i Health and Wellness Center project area is situated on would have been the near shore waters off of Ka'ākaukukui, which is an *'ili* awarded to Victoria Kamāmalu in 1848 (LCA 7713). The land on which the project area sits was a Historic refuse landfill. Ka'ākaukukui was among several Bishop Estate properties acquired by the Territory of Hawai'i in 1919.
2. The project area is near to Kou, which is was a politically important harbor and village prior to European contact and is now the location of the city of Honolulu. King Kamehameha I moved the seat of government to Kou in 1809. The expansion of Kou affected the surrounding areas, including Ka'ākaukukui.
3. Historic Bishop (1884) map indicates that a "Beach Road" once ran along the shoreline and makai of the *'ili* of Ka'ākaukukui. This road appears to have become Ala Moana Blvd. The Wall (1911) map shows a retaining wall running along what is now Olomehani Street and the area makai of Ala Moana Blvd was filled with sediment by that time.
4. Unlawful residents came to inhabit the area and the area became known as 'Squattersville.' Wilson Okamoto and Associates, Inc. (2002) references Clark's (1977:64) description of 1920s Squattersville as a fishing village of roughly 700 people, mostly of Native and part-Hawaiians. The Territorial Government evicted the squatters in 1926.
5. Wilson Okamoto and Associates, Inc. (2002) also uses Clark's (1977) description of Ka'ākaukukui in the 1930s and 1940s, where the area is still a popular fishing and swimming area for the people of Kaka'ako. Clark (1977) maintains that there was a surf break called 'Stonewall' that local kids surfed on redwood planks. Marine resources were abundant and locals dove and caught a variety of fish and squid and also gathered limu and wana from the reef.
6. Wilson Okamoto and Associates, Inc. (2002) continue with Clark's (1977) description of how the City and County of Honolulu transformed Ka'ākaukukui into a dump in the late 1940s and early 1950s, extending a massive seawall seaward to retain the city's refuse. Kaka'ako Waterfront Park is situated on the footprint of the landfill.
7. According to Wilson Okamoto and Associates, Inc. (2002) the coastline continues to be utilized for a variety of recreational activities including fishing, swimming, and surfing as well as a gathering place for family picnics, barbeques, and parties.
8. The park and shoreline access areas are from the Kaka'ako Waterfront Park parking lot and several streets that terminate at the park.

Table 4. Spearing et al. (2008) Results of Background Research

Spearing et al.(2008:iii-v)
1. The current urban district known as Kaka'ako is significantly larger than the traditional area of the same name, which is described in mid 19th century documents and maps as a small *'ili* (traditional land unit). In addition to Kaka'ako, the Mauka Area District also includes lands once known as Ka'ākaukukui, Kukuluāe'o, and Kewalo, and possibly smaller portions of other *'ili*.
2. In traditional times, the study area is characterized by fishponds, salt ponds, trails connecting Honolulu (Kou) and Waikīkī, and occasional taro *lo'i*. Wetland/fishpond deposits have been documented in the Kaka'ako Mauka Area.
3. Previous archaeological work confirms that there are intermittent buried cultural layers in this near shore environment reflecting the Hawaiian pattern of permanent settlements in proximity to agriculture, aquaculture and marine resources.
4. There are four large historically documented cemeteries in the Mauka Area District. The full extent of these cemeteries has not been delimited and there are likely to be hundreds of burials associated with these cemeteries but outside the modern structures. Archaeological evidence has shown that during post contact times portions of the lands in and around the Mauka Area District were used to bury large numbers of people in unmarked cemeteries. A total of 274 historic burials have been recorded (*in situ* or disinterred) in the Kaka'ako Mauka Area.
5. Kaka'ako is a highly urbanized area with a mix of low, mid and high rise structures. There are no structures in the Mauka Area that predate or reflect the style of construction prior to western contact with native Hawaiians in 1778. A few remaining buildings were built by or inspired by nineteenth century missionaries, however, most buildings in Kaka'ako were built during the twentieth century after Hawai'i became a U.S. territory. To preserve Kaka'ako historic resources in accordance with Chapter 206E, HRS, the Draft Mauka Area Plan identifies eight properties to be protected. See Table 5. All eight properties are listed on either the National or State Register of Historic Places. The Draft Mauka Area Plan also proposes to protect the City and County of Honolulu's Neal Blaisdell Center for its cultural and aesthetic value.
6. The study area is associated with *mo'olelo* (oral history) in which Ka'ākaukukui, Kewalo and Kukuluāe'o were traditionally noted for their fishponds and salt pans, for the marsh lands where *pili* grass and other plants could be collected, for ceremonial sites such as Pu'ukea Heiau, Kewalo Spring, and Kawailumalumai Pond at which sacrifices were made, and for their trails that allowed transport between the more populated areas of Waikīkī and Honolulu. Important chiefs such as Hua-nui-ka-la-la'ila'i were born in the area and conducted religious rites, and commoners traveled to the area to procure food and other resources; some commoners probably also lived in the area, possibly adjacent to the ponds and the trails. The study area is also associated with legendary accounts of the Waters of Ha'o, Kapoi and the *heiau*, and the legend of Hi'iaka and more.

Table 5. Vogeler et al. (2010) Results of Background Research

Vogeler et al. (2010:iv-vii)
1. Covington's 1881 map indicates that the Project area is within Kewalo Ahupua'a and that the Kewalo Ahupua'a is comprised of Kaka'ako 'Ili on the east and Kukuluāe'o 'Ili on the west. While modern districting refers to Kewalo Ahupua'a as Kaka'ako District, the size and placement of the letters on Covington's 1881 map suggest that Kewalo is the larger land division, with Kaka'ako 'Ili and Kukuluāe'`o 'Ili inside this *ahupua'a*. Moreover, Kewalo is not a continuous *ahupua'a*. As the Hawaiian Government Surveys office explained in 1850: "Kewalo … had its seacoast adjoining Waikīkī, its continuous kula on the plain, and one-half of Punchbowl Hill and its kalo land in Pauoa valley" (see Section 4.2.1).

Vogeler et al. (2010:iv-vii)
2. From the *moʻolelo*, one can see that Kewalo, with the *ʻili* of Kakaʻako and Kukuluāeʻo, was noted for its fishponds and salt pans, for the marsh lands where *pili* grass and other plants could be collected, for ceremonial sites such as Puʻukea Heiau and Kewalo Spring, for Kawailumalumai Pond, where sacrifices were made, and for the trails that allowed transport between the more populated areas between Waikīkī and Honolulu.
3. Important chiefs were born in the Kewalo area and conducted religious rites, and commoners traveled to the area to procure food and other resources. Some commoners perhaps lived in the area, adjacent to the ponds and trails.
4. Perhaps the most famous *wahi pana* (storied place) of Kewalo is the fish pond called Kawailumalumai, or "Drowning Waters," used to drown *kauwā* or *kapu* (taboo) breakers as the first step in a sacrificial ritual known as *Kānāwai Kaiheheʻe* (Kamakau 1991:6), or *Ke-kai-heʻeheʻe*, which translates as "sea sliding along," suggesting that the victims were slid under the sea (Westervelt 1991:16). Early references indicate that Kawailumalumai Pond may have been near what was once the Ward Estate (now Neal Blaisdell Center).
5. Kewalo is located between two centers of population, Kou and Waikīkī, on the southern shore of pre-Contact Oʻahu. In Waikīkī, a system of taro *loʻi* (irrigated fields) fed by streams, descending from Makiki, Mānoa, and Pālolo valleys, blanketed the plain, and networks of fish ponds dotted the shoreline. Similarly, Kou (the area of downtown Honolulu surrounding the harbor) possessed shoreward fishponds and irrigated fields watered by ample streams descending from Nuʻuanu and Pauoa Valleys. The pre-Contact population and land use patterns of Kewalo may have derived from its relationship to these two densely populated areas; it may have participated in some of the activities associated with them.
6. By the 1840s LCA claims indicate that traditional Hawaiian usage of the region and its environs seems to have remained confined to salt making and farming of fishponds, with some wetland agriculture in those areas *mauka* or toward Waikīkī at the very limits of the field system descending from Makiki and Mānoa Valleys. Kewalo had a narrow upland section (often called "Kewalo Uka"), a larger lower river valley section, and a small coastal section (called "Kewalo Kai") joined by a small strip of land. The Project area is within this large LCA claim. Taro patches probably existed north of King Street. The lot south of the Project area consisted of fish ponds. It is evident from the 1855 La Passe map (Figure 9), that there were also once fish or salt ponds in the current Project area. An 1897 map (Figure 13) indicates that the swampy central Kewalo section was used to plant rice by the late nineteenth century.
7. The Ward Estate once covered a large portion of the Kakaʻako Mauka District. Curtis Perry Ward, a native of Kentucky, came to the Hawaiian Islands in 1853 and in 1865 married Victoria Robinson, who was descended from the Hawaiian *aliʻi* and early French and British residents. For his new family, Ward purchased at auction the 12-acre estate of Joseph Booth, Royal Patent 306, and additional contiguous lands in the Kōʻula area in 1870 (Hustace 2000:21–25). This constituted the *mauka* portion of "Old Plantation" from Thomas Square on King Street to the *makai* border at Waimanu Street. A few years later (before 1875), Ward added to his property with the purchase of 77 acres and 3,000 feet of ocean frontage in the *ʻili* of Kukuluāeʻo, *makai* of Queen Street. Workers were hired to clear the fishponds and ditches, plant taro in the fishponds, fence in pastures for the horse, plant 6,000 coconut trees, plant *kiawe* trees for firewood, and restore the *kāhaka* (salt pans) near the shore (Hustace 2000:41).
8. In 1930, her husband having died in 1882, Victoria Ward incorporated Victoria Ward, Limited to manage the estate. In 1957, the City and County of Honolulu purchased the *mauka* portion of the estate to construct the new Blaisdell Civic Center [sic] (Hustace 2000:67, 77).

Vogeler et al. (2010:iv-vii)
9. In 1907, when Honolulu High School moved from Fort Street to its new building on the corner of Beretania and Victoria Streets, two blocks north of its present location (Figure 18), the new school was named the President William McKinley High School. In 1898 President McKinley had signed the Newlands Resolution. From 1898 forward, Hawaiʻi was referred to as the Territory of Hawaiʻi (until 1959 when the official name changed to the State of Hawaiʻi). Due to an increase in students, a new site was acquired in 1921, just two block from its 1907 site. McKinley High School moved in 1923 to its present location between King Street and Kapiʻolani Boulevard, west of Pensacola Street (Figure 18). McKinley High School was the only public high school in Honolulu prior to the construction of Farrington High School in 1936. McKinley High School was particularly important for the first and second generation descendants of sugar plantation immigrant workers, and more than half of the student population was composed of students of Japanese descent in the 1930s (Odo 2004:76).
10. According to the McKinley High School website, "A statue of President McKinley was commissioned for $8,000. Completed in New York, the Bronze eight-ton statue was shipped to Honolulu and dedicated on February 23, 1911" (President William McKinley High School). In 1911, the *Pacific Commercial Advertiser* reported that the statue was intended to "immortalize his memory" (*Pacific Commercial Advertiser* 1911). The *Joint Resolution to Provide for the Annexing of the Hawaiian Islands to the United States* (1898), or Newlands Resolution, signed by President McKinley, is a U.S. domestic law, not an instrument of international law. No treaty of annexation was ratified under U.S. law. Yet the McKinley Statue holds a document labeled "Treaty of Annexation" (Figure 17).
11. After World War II, the Kakaʻako area became increasingly industrialized, and residents moved out to the newer subdivisions away from the Honolulu central area. A 1943 U.S. War Department map (Figure 16) shows the newly developed Kewalo Basin. A 1956 U.S. Army map of Oʻahu (Figure 20) illustrates the continued construction of buildings and fields at McKinley High School, including an athletic field within the current Project area.
12. In 2009, CSH completed an archaeological monitoring plan for a portion of the McKinley High School Athletic Complex Master Plan Project (O'Hare et al. 2009). This area included the softball stadium and the girl's locker room and shower facility. The monitoring plan specified that an archaeological monitor would be on-site during all ground-related disturbance activity below 18 in (0.45 m), due to the cultural sensitivity of the area and the number of burial finds already encountered in the vicinity of the project area. No fieldwork was performed under this monitoring plan.
13. In the accompanying AISP to this CIA, Burke and Hammatt (2010) determined the following: Burial densities in the vicinity of the present project area (which appears to have been mostly wetlands) could be expected to be lower than other areas where more sandy layers are present. Nevertheless, previous archaeological reports have documented human burials—both pre-contact Hawaiian and historic—throughout the greater Kakaʻako area, which includes the Kewalo area. Isolated burials and burial clusters have been found primarily in sandy deposits, just above the water table and below historic-era fill materials. Two documented historic cemeteries near the current project area were also located in sandy deposits.

Table 6. Genz & Hammatt (2010) Results of Background Research

Genz & Hammatt (2010:v-ix)
1. The location and extent of the area called Kakaʻako is ambiguous. The modern urban district of Kakaʻako is comprised of the *ʻili* (land section) of Kakaʻako and other lands once part of the extant *ahupuaʻa* (land division usually extending from the uplands to the sea) of Honolulu.

Genz & Hammatt (2010:v-ix)
2.The Kakaʻako area has been heavily modified over the last 150 years due to historic filling of the area for land reclamation; however, the fill has served as an agency of preservation rather than destruction of the patterns of early Hawaiian life and the remains of nineteenth century Honolulu and Waikīkī (Griffin et al. 1987:73). Much of the *wahi pana* (storied places), *loko iʻa* (fishponds), *heiau* (shrines), and other cultural resources, and natural deposits and land forms of the area have survived below this fill. Accompanying *moʻolelo* (stories, oral traditions), *oli* (chants), *ʻōlelo noʻeau* (proverbs), and *wānana* (prophecies) have been documented that still resonate with Hawaiians of the Kakaʻako district today.
3. The *ʻili* of Kakaʻako and surrounding lands remained outside the two most intensely populated and cultivated areas on southeastern Oʻahu—Waikīkī and Honolulu—during pre-Contact times, yet Hawaiians used the lowland marshes, wetlands, salt pans, and coral reef flats for salt making and farming of fishponds along with some limited wetland taro agriculture (Kotzebue 1817), and this supported habitation sites clustered around the *mauka* (inland) boundary of the Kakaʻako area near Queen and King Streets (LaPasse 1855).
4. The salt marshes were excellent places to gather pili grass for the thatching of houses, which may have led to the name Kakaʻako (prepare the thatching) (Thrum 1922:639). *Moʻolelo* point to the coastal marshes of Kewalo as the habitat of the original *pueo* (owl) that became one of the Hawaiians' *ʻaumākua* (deified ancestors) (Westervelt 1963:135–137; Thrum 1998:200–202). The *moʻolelo* of Kawaiahaʻo follows a trail between Waikīkī and Honolulu to locate two freshwater springs—Kewalo Spring and Kawaiahaʻo (The Waters of Haʻo) (Pukui 1988:87–89), which highlights its location between the two main population centers.
5. Kewalo was once associated with a spring called Kawailumalumai (drowning waters, Sterling and Summers 1978:292) that was used to sacrifice *kauwā*, or members of a pariah caste, designed for the *heiau* of Kānelāʻau on the slopes of Pūowaina (Punchbowl) as the first step in a drowning ritual known as Kāneāwai Kaihehe'e (Kamakau 1991:6) or Ke-kaihe'ehe'e (sea sliding along) (Westervelt 1963:16).
6. Puʻukea Heiau (white hill), which belonged to the chief Huanuikalalaʻilaʻi, was possibly located on one of the few elevated locations in the flat, low-lying swamp that surrounded it. *Kāhuna* (priests) used *mahiki* (a kind of grass) of Puʻukea, which grew on the nearby coast, to exorcise malicious spirits from the afflicted (Pukui and Elbert 1986:219), a concept that still resonates with the contemporary usage of *mahiki* in lines of *hoʻoponopono* (family conference in which relationships are set right) inquiry to "peel off" layers of deeper feelings (Pukui et al. 1972:228).
7. Land Commission Award (LCA) documents reveal that much of the land in Kakaʻako was used to produce salt, including: salt ponds near the shore that filled with salt water at high tide (*ālia*), drains where the salt water from these pans was transferred to smaller clay-lined or leaf-lined channels (*hoʻoliu*), natural depressions in the rocks along the shore where salt formed naturally (*poho kai*), and land (*kula*) that could probably not be used for agriculture as it was impregnated with salt (LCA 1903). The abundance of salt led to the Kakaʻako Salt Works in the late nineteenth century (Hustace 2000:50).
8. The Kakaʻako area continued to remain outside Waikīkī and Honolulu during the post-Contact era. It served as a place of the dying and the dead, of isolation and quarantine, of trash and wastelands, and the poor and the immigrant; however, it also represents the birth of modern Waikīkī and Honolulu (Griffin et al. 1987:73). Specifically in this area: victims of the 1853 smallpox epidemic were quarantined in a camp (Thrum 1897:98) and those that did not survive were buried at Honuakaha Cemetery (Griffin et al. 1987:13); Hansen's Disease patients were treated in the Kakaʻako Leper Branch Hospital (Griffin et al. 1987:55); victims of the 1895 cholera epidemic were treated at the Kakaʻako Hospital (Thrum 1897:101); infected patients of the 1899 bubonic plague were moved to a quarantine camp; animals were quarantined in a station in 1905; and the city's garbage was burned in an incinerator at Kewalo Basin (UH 1978).
9. After the annexation of the Hawaiian Islands by the United States in 1898, the U.S. Congress began to plan for the coastal defenses of their new islands, which included Fort Armstrong on the Kaʻākaukukui Reef as a station for the storage of underwater mines. In 1911, the Honolulu Rifle Association, and possibly other groups, used the flat, uninhabited Kakaʻako lands near the coast as a rifle range (Williford and McGovern 2003:15).

Genz & Hammatt (2010:v-ix)
10. The late nineteenth and early twentieth centuries were a time of intense development of the coasts of Honolulu, Kakaʻako, and Waikīkī. A number of land reclamation projects dredged offshore areas to deepen and create boat harbors, and used the dredged material to fill in the former swampy land. Kakaʻako became a prime spot for large industrial complexes, such as iron works, lumber yards, and draying companies (Nakamura 1979).
11. Kewalo Basin harbor was formerly a shallow reef that enclosed a deep section of water that had been used as a canoe landing since pre-Contact times and probably was used since the early historic period as an anchorage. Dredging of the Kewalo Channel began in 1924, but by the time the concrete wharf was completed in 1926, the lumber import business had faded, so the harbor was used mainly by commercial fishermen. In 1941, the government dredged and expanded the basin to its current 22 acres. In 1955, workers placed the dredged material along the *makai* (seaward) side to form an eight-acre land section protected by a revetment—now the Kewalo Basin Park (Kewalo Basin Harbor 2009).
12. In 1899, Gorokichi Nakasugi, a Japanese shipwright, brought a traditional Japanese sailing vessel, called a *sampan*, to Hawaiʻi, and this led to a unique class of vessels and distinctive maritime culture associated with the rise of the commercial fishing industry in Hawaiʻi (Van Tilburg 2007). Japanese-trained shipwrights adapted the original *sampan* design to the rough waters of the Hawaiian Islands (Krauss 2006). The fishermen used a traditional live bait, pole-and-line method of fishing and unloaded their catches of *aku* (bonito, skipjack) and *ahi* (yellow-fin tuna) at Kewalo Basin (Van Tilburg 2007:43). The *sampan aku* fleet relocated to Kewalo Basin by 1930, and the McFarlane Tuna Company (now Hawaiian Tuna Packers) built a shipyard there in 1929 and a new tuna cannery at the basin in 1933 (Clark 1977:64). The *sampan* fishing industry declined dramatically following World War II, such that today the *Kula Kai*, built in 1947, is the only surviving vintage wooden *sampan* in Hawaiʻi (Krauss 2006).
13. Previous oral histories of Kakaʻako residents documented the lives of the "unsung heroes" of Kakaʻako from the early twentieth century—the machinists, firemen, cannery workers, and others from diverse ethnic backgrounds that shaped the history of Hawaiʻi (UH 1978). Many of the interviewees were of Japanese descent, and many of their fathers were fishermen who settled in Kakaʻako to have access to the waterfront. Usaburo Katamoto, a boat builder, described 35-foot *aku sampan* "sailing in the fair wind" off the Kewalo Basin harbor and Pearl Harbor, and that he used to dray the newly built vessels with a team of a dozen mules (UH 1978:534-632). Keisuke Masuda, a foreman at Hawaiian Tuna Packers, described in detail how at night he and a small crew of transient Filipinos unloaded the fish from the *sampan*, weighed the fish, operated the boiler, and steamed the fish, and how 200 Japanese women cleaned the fish and packaged the canned tuna (UH 1978:817-876).
14. As a result of the dredging, no pre-twentieth century burials or other pre-twentieth century finds would be expected in the immediate vicinity of the harbor, and there is no documented evidence from archaeological surveys, historical records, or oral traditions of *ilina* (graves) or *iwi kūpuna* (ancestral remains) within the Project area. However, the adjacent lands of Kakaʻako contain two large cemeteries and numerous burials, and human skeletal remains were discovered near the former coastline on the *mauka* side of Kewalo Basin at the intersection of Ala Moana Boulevard and Kamakeʻe Street (Souza et al. 2002). Further, the original foot path at the edge of the former coastline has been transformed through time to a horse path, buggy and cart path, and finally to the widened Ala Moana Boulevard. As a result, early twentieth century human burials and other cultural resources could potentially be located adjacent to the *makai* curb of Ala Moana Boulevard, but any lands seaward of the old trail were probably too close to the water table and too unstable to have been used for permanent habitation or burials (Hammatt and Shideler 2010).
15. During the first half of the twentieth century, the marshlands and rice fields in the Kakaʻako district were filled to accommodate the expanding urbanization of Honolulu. Poverty-stricken settlements arose in the 1920s, camps of Hawaiians, Portuguese, Chinese, and Japanese settlers developed in the 1930s, and the area became increasingly industrial in the 1940s. In the 1960s, the explosive growth of surfing in Waikīkī forced many surfers to explore and discover uncrowded breaks, including the waters of Ala Moana Beach Park and Kewalo Basin (Clark 1977:64)

Table 7. Elison & McElroy (2011) Results of Background Research

Elison & McElroy (2011:58-59; 103)
1. [Kaka‘ako was] Once a low, swampy area which has consequently undergone development through the addition of fill, Kaka‘ako was situated between the two royal centers located in Honolulu (formerly Kou) and Waikīkī. Place names and *‘ōlelo no‘eau* associated with Kaka‘ako highlight the natural resources, with the area of Kukuluāe‘o being named after the *ae‘o*, or the Hawaiian Stilt which found refuge in the area’s salt ponds. *‘Ōlelo no‘eau* associated with Honolulu, Kou, Kewalo, Kālia and the seas of Kuloloia and Māmala reveal a place that many, including *ali‘i*, frequented for various purposes such as the playing of *kōnane*, playing music, fishing and gathering resources such as *alamihi* crabs and salt (Elison and McElroy 2011:58).
2. *Mo‘olelo* referring to Kaka‘ako, Kewalo and Honolulu also offer insight into the natural landscape and traditional practices of the area. In these *mo‘olelo*, Kaka‘ako is the stage upon which legendary figures such as ‘Ai‘ai, son of the fishing god Ku‘ula, meets his wife and creates fishing *ko‘a* (shrines) (Elison and McElroy 2011:58).
3. Historic accounts and artistic renditions of Honolulu, Kewalo, Kālia and Kaka‘ako provide valuable information on traditional land use practices and topographic elements dating to the pre- and early post-Contact eras. The landscape of Kaka‘ako is generally depicted as flat, warm and cultivated, with trails meandering through *lo‘i kalo* and inland fishponds. Many artistic renditions show habitation sites, as well as the marshy salt ponds which typify this area of O‘ahu's southern shore (Elison and McElroy 2011:58).
4. Mele of Kaka‘ako and its vicinity reveal information coinciding with *‘ōlelo no‘eau* and historic accounts regarding land use and also presents the opportunity to better understand the lives of its inhabitants in the nineteenth and twentieth centuries. As with any area, *mele* address a diverse array of subjects and express infinitely many sentiments. Those associated with Kaka‘ako are no different and include chants referring to the birth of chiefs such as Hua-a Kamapau, which was born in Kewalo, *mele* about being quarantined for cholera and mele referring to the alcoholic drinks served at the old Kewalo Inn. This diversity of *mele* exemplifies the many changes which make the area of Kaka‘ako such a historically significant place (Elison and McElroy 2011:58-59).
5. Land Commission Awards are a highly valuable resource for identifying traditional land use practices. Examination of testimony describing the lands of the subject property and the surrounding area reveals the high frequency of taro ponds, *ki‘opua* (ponds for young fish), pasture land, and few house sites. Previous archaeological investigations also present supporting data, recording many subsurface cultural sits associated with various pond sediments. Archaeological records also produce valuable information regarding pre-Contact use of Kaka‘ako, as well as the high frequency of human burials within the area, many of which are likely to be associated with the number of diseases that ravaged Hawai‘i’s population (Elison and McElroy 2011:59).
6. Previous ethnographic studies of Kaka‘ako contain valuable information about life in Kaka‘ako during the 1900s. Oral history interviews conducted with previous residents shed much light onto this once heavily populated area and its significant and dynamic history (Elison and McElroy 2011:59).
7. The background study revealed that Kaka‘ako was a culturally significant area with many natural resources which supported traditional subsistence activities such as fishing, the gathering of plants, *limu* (seaweed), the production of *pa‘akai* (salt), and supporting numerous inland fishponds used to raise mullet and *awa*, as well as *kalo* (Elison and McElroy 2011:103).
8. The location of Kaka‘ako, between active royal centers in Honolulu and Waikīkī, has shown that it was an integral location ideal to support food and salt production activities which fed the *ali‘i* and the royal families (Elison and McElroy 2011:103).
9. Kaka‘ako’s history also provides insight into the plights of thousands of people, of all ethnicities who fell as victims to the various diseases which struck Hawai‘i in the 1800s. One could surmise that, due to the population density of Kaka‘ako within the environs of Honolulu, the region was one of the hardest hit locations in all of Hawai‘i (Elison and McElroy 2011:103).

4.2.3 Results of Community Consultations

The CIA performed by Wilson Okamoto and Associates, Inc. (2002) did not follow the protocol listed in the *Guidelines for Assessing Cultural Impacts* (OEQC 2011) in terms of identifying and consulting with individuals and organizations having expertise in cultural resources, practices, and beliefs on the subject area. No individuals were identified as cultural informants nor were any ethnographic interviews or community consultations performed.

Spearing et al. (2008), dispatched requests for participation to eighty-one community members representing government agencies, community organizations, and individuals, including such stakeholders as Kaka‘ako residents, cultural and lineal descendants, as well as cultural practitioners. A total of thirty-four cultural informants, comprised of twelve *kūpuna* (elders) and/or *kama‘āina* (native-born) responded to these requests and participated in interviews. These consultations founded 5 major concerns over adverse impacts on cultural, historic, and natural resources as well as cultural practices and beliefs potentially initiated by the proposed Kaka‘ako Mauka Area Plan. Table 6 provides the Management Summary of Community Consultation Results presented by Spearing et al. (2008: v-vii). However, the Spearing et al. (2008) Results of Community Consultations (Section 10.2 and Management Summary) minimally recapitulates the Community Consultations (Section 6), Summaries of Kama‘āina Interviews (Section 7), and Consultation of Cultural and Lineal Descendants (Section 8). Much more detail from the interviews is warranted with distinct cultural resources and practices organized or listed. Additionally, areas adjacent to the Kaka‘ako Community Development District Mauka Area Plan project area were not assessed, which is a directive of the *Guidelines for Assessing Cultural Impacts* (OEQC 1997:1).

The results of Vogeler et al. (2010) were based upon five formal interviews, though twenty individuals were contacted. Some of the report was supplemented with project area information presented in previous Cultural Surveys Hawai‘i, Inc., CIA reports. Table 7 lists the Management Summary of Community Consultation Results presented by Vogeler et al. (2010: vii-x). The results of Community Consultations in Vogeler et al. (2010) reveal some sentiments regarding the changing cultural landscape of McKinley High School. One concern is that the “Hawaiian” feeling on campus, in terms of architecture and use of traditional plants as well as ethnic diversity, which once gave some of the informants a sense of place and comfort, has dwindled since the informants had left the school. Another concern is that the McKinley statue and plaque mislead those not familiar with the history behind the figure and his policies. While the project area itself was adequately assessed, the scope of the assessment was limited to the McKinley High School Athletic Complex project boundaries, which is not in keeping with the *Guidelines for Assessing Cultural Impacts* (OEQC 1997:1), which states that adjacent areas be assessed as well.

Genz and Hammatt (2010) made efforts to contact thirty-nine cultural informants, each representing either themselves as cultural or lineal descendants, residents, community members, and/or cultural practitioners as well as government agencies and community organizations. Six individuals, made up of *kūpuna* and *kama‘āina* were interviewed. Table 8 provides the Management Summary of Community Consultation Results presented by Genz and Hammatt (2010: ix-xi). Through comprehensive community consultations, Genz and

Hammatt (2010) have provided new insights on the cultural significance of the Kewalo Basin and surrounding land and water. Several cultural groups and resources were identified that may be impacted by the proposed harbor improvements, including the *Kula Kai*, which the last operating *aku sampan* in Hawai‘i, as well as surfers, practitioners of *lā‘au lapa‘au*, and fishermen among others. Overall, Genz and Hammatt (2010) have demonstrated due diligence under the 1997 OEQC *Guidelines for Assessing Cultural Impacts* as well as Act 50, SLH 2000. Yet, the scope of the assessment should cover areas adjacent to the project boundary and the summary of cultural resources and practices identified could be much more concise.

While eighty-eight request letters were sent to cultural descendants of Kaka‘ako area and requests sent to nine Native Hawaiian organizations, a total of eight ethnographic interviews were included in Elison and McElroy (2011). Interviewees had varied connections to Kaka‘ako, including individuals who were born and/or raised in Kaka‘ako, as well as those who traced their lineage to Kaka‘ako. Several themes, referred to as "Topical Breakouts," were investigated during these interviews: Personal Connections to Kaka‘ako, The Past: Pre-Contact Kaka‘ako, The Past: Post-Contact Kaka‘ako, and Today: Kaka‘ako and Ko‘olani Phase II Plans. Interviewees shared first-hand knowledge and the *mana‘o* that was passed down to them from their **kūpuna** to address these themes. Table 9 summarizes Elison and McElroy's (2011) ethnographic interview findings.

Table 8. Spearing et al. (2008) Results of Community Consultations

Spearing et al. (2008:v-vii)
1. The Mauka Area District and vicinity is likely to have surface and subsurface cultural and historic properties, including human burials. Several of the study participants indicated that there could be *iwi kūpuna* (ancestral remains) in or near the subject Mauka Area District. Phyllis "Coochie" Cayan of SHPD states, "As you know from past and current projects in the area and the ahupua‘a—the makai area is a high risk for human burials. There has been past inadvertent finds mauka, but not as numerous as the makai areas." Study participants made the following recommendations: a. Due to the fact that the Mauka Area District is likely to have surface and subsurface cultural and historic properties, Hui Mālama I Na Kūpuna O Hawai‘i Nei has recommended a thorough, in-depth archaeology inventory survey. OHA recommended for every developer within HCDA's jurisdiction to conduct an archaeological inventory survey to identify *iwi kūpuna* as the probability of burials and other cultural properties in the Mauka Area District is high. b. Cultural descendant Paulette Kaleikini has stated that, "any/all burials must be preserved in place and left undisturbed." She also requested that "a cultural monitor be on duty each and everyday during the survey and testing and also that a detailed record of any/all *moepū* (funerary objects) and artifacts be kept." c. OHA, SHPD, Hui Mālama I Na Kūpuna O Hawai‘i Nei, Leimomi Khan, Charles Kapua, Dr. Claire Hughes, Paulette Kaleikini and Paulette Moore state that *iwi kūpuna* finds be protected and treated respectfully.

Spearing et al. (2008:v-vii)
2. Several participants voiced negative feelings and concerns about the overall cumulative impacts of ongoing and future developments in Kaka‘ako and Mauka Area District environs as contributing to the loss of what is authentic and traditional about Kaka‘`ako. Study participants mentioned factors such as: housing prices and rental space for businesses being beyond the reach of most *kama‘āina* and the displacement of local, family businesses by national chains. A few participants provided suggestions for development projects that might generate more tourism to the area while maintaining a Hawaiian sense of place and the look and feel of "old Kaka‘ako" including: (a) creating a pedestrian overpass over Ala Moana Boulevard to Kewalo Basin, (b) refurbishing the fish auction house, (c) creating a monument in Kaka‘ako as a repository for genealogies of the Hawaiian monarchy, (d) creating a Hawaiian "cultural market" and, (e) providing local businesses with lower rent.
3. A related concern is the loss of historic properties in the Mauka Area District and vicinity. The Historic Hawai‘i Foundation (HHF) referred CSH to an inventory study prepared by Fung Associates for General Growth Properties (GGP) (2008) in which 13 parcels were identified within the master plan boundary that contain structures of historic integrity that will become eligible for designation on the State Register of Historic Places within the 30 year planning horizon. HHF emphasized that of the 13 parcels identified in the 2008 Fung Associates inventory for state and national registers of historic places, the IBM Building at 1240 Ala Moana Boulevard designed by Vladimir Ossipoff (1962) is significant for its distinctive architecture and the work of a master and is thus eligible for designation on the Hawai‘i Register of Historic Places. HHF further recommended for this CIA that, …similar study and evaluation of the remaining blocks to be conduced and that the findings from the GGP inventory be incorporated. Notable sites will include those already listed on the Hawai‘i State or Nation Registers of Historic Places, such as McKinley High School and the Ala Moana Pumping Station, as well as…the Dickey-designed theater, WWII-era and post-war Quonset huts, modernist structures at the Blaisdell complex, and other residential, commercial and industrial buildings throughout Kaka‘ako. Community contacts interviewed for this study also noted the significance of historic properties in the Mauka Area District and vicinity and stated their desire to see the preservation and/or rehabilitation of properties in or near the Mauka Area District such as Fisherman's Wharf, Ward Farmers Market (formerly, Ala Moana Fish Market), Mother Waldron Neighborhood Park, Kewalo Theater and buildings on Queen Street such as the Quonset huts and the Hamada H. Store.
4. Some participants voiced opposition to the development, construction or alteration of Kaka‘ako that threatens to negatively impact its view corridors and remaining green spaces (parks). Participants are concerned that high rises will further obstruct *mauka-makai* views; one participant stated his concern that further high rises would create a wind tunnel; another participant recommended that building height be limited to 40 feet. Two participants provided suggestions to help remediate the loss of green spaces and to protect the natural environment including: pursuing a green initiative by, for example, using a deporter that transfers deep, cold ocean water to power air conditioners in buildings close to the shoreline; creating a Hawaiian garden with plants that people used and use in everyday life such as *kukui* (*Aleurites moluccana*) and *tī* (*Cordyline fruticosa*).
5. A few participants expressed concern about the study area's overtaxed infrastructure mentioning, for example, streets in disrepair, traffic congestion and waste management problems as a result of current and future developments in Kaka‘ako.

Table 9. Vogeler et al. (2010) Results of Community Consultations

Vogeler et al. (2010:vii-x)
1. The two McKinley High School alumni celebrated the diversity of the school. State Senator Suzanne Chun Oakland thus describes the culture of McKinley High School: McKinley has always had a very diverse population of people, so we celebrated culturally. We had a May Day program during the day and in the evening. And we had all the students share their cultural practices, whether it was games, food, different kinds of dances, song. So, I don't know if there has been that kind of continuation. But I know that when I was there, I really wanted to celebrate the diversity of our cultures there. You had over 3,000 teachers because every student was a teacher for me, personally. When thinking back to the late-1950s and early-1960s, Ms. Pi'ilani Kaopuiki similarly describes a community where there was an exchange of cultural foods and ideals. For Ms. Kaopuiki, the community has changed: "the warmth and welcome has gone: evaporated." Yet, Ms. Kaopuiki also notes that McKinley High School's lack of Hawaiian cultural significance as the primary trait of the school: "To me, the cultural significance of McKinley (High School) is that it doesn't have any Hawaiian culture in its physical plans now. It looks like wherever it came from…someplace in Europe."
2. Plants and agriculture of Kewalo were once an important part of the school curriculum and the culture. Senator Chun Oakland recalls a club at McKinley High School for Future Farmers of America and many other clubs, as well as a robust agricultural program before she became a student. While she was a student, these clubs and the agricultural programs "just did planting on the school site. My understanding before is that they used to go to the farms and be able to take care of the farms. That was part of the curriculum." Mr. Charles Kapua remembers various plants that were gathered from the *ahupua'a* (land division usually extending from the uplands to the sea) near the Project area, including banana stumps, *kōko'olau* plants, *kamani* leaves, and *wiliwili* berries. One unnamed participant gathered medicinal plants for *lā'au lapa'au*. These included *'uhaloa, pōpolo, māmaki, kī* and *laukahi*. The *'uhaloa* and *laukahi* were gathered on the McKinley High School campus. This anonymous participant identifies plants as part of Hawaiian sensibilities. She believes that, "the grounds could use some work…. I hope they keep the Hawaiian flavor too—and not be so sterile…. I think the plantings and grounds should blend with the style of these stately buildings." Ms. Kaopuiki similarly believes that native plants should be included in the new landscaping: "My hope is that they will incorporate native plantings. You're going to have plantings— then use native plantings because we have them available now."
3. As far as fishing in the area, Ms. Kaopuiki heard of net fishing and pole fishing near Ala Moana and the Kewalo Basin, fishing from the shoreline and in boats. For Uncle Charles Kapua, his grandfather on his mother's side had a sampan boat that would go out to catch fish in Kewalo Basin. They would catch *aku, 'ōpelu, akule* and other fish. When asked if he remembered the names of the *aku* boats, he remembered the Yellowfin aku boat. The unnamed participant fished in the harbor and caught several kinds of reef fish, including 'aweoweo, *manini, opelu, 'aholehole,* and *'ama'ama*, and squid (see Appendix B).

Vogeler et al. (2010:vii-x)
4. All participants spoke of a sense of place, in one way or another. However, this idea meant different things to each individual. For Ms. Kaopuiki: A sense of place means that you recognize that we have trade winds, and try to use that in the design. That's the sense of place. I've been to some places that as soon as you get off the airplane, and you see the buildings, you know that you are in someplace different because their designs speak of where they are: Sāmoa. It's hard if you are in a city. But these people have an opportunity, especially since they're not going to build towers, where towers have to meet certain conditions, they can design so that there's a sense of being in Hawai'i. Senator Chun Oakland associates this sense of place with the architecture of the schools and the surrounding area: "What has been associated with McKinley [High School] are the beautiful grounds that we have. The historic buildings that we were able to preserve. So, I really hope that kind of ambiance is kept." Uncle Charles recommends building structures that match the existing architecture of the school.
5. While the McKinley Statute does not fall within the Project area, three of the five participants interviewed mentioned the inaccuracy of the McKinley Statue specifically. While the statue is a source of pride for one participant in this study, the three Native Hawaiians interviewed spoke of the inaccuracy of the depiction. Some viewed the "Treaty of Annexation," held in the statue's hand, as an attempt to misrepresent history. Ms. Kaopuiki explains that: This school is named in honor of someone whose place in Hawaii's history is not one of pride. Wouldn't it be nice if it was decided that, because the school is an educational institution and should represent truth, that President McKinley doesn't deserve such honorable recognition—here in Hawai'i anyway. The name of the school should be changed and the statue removed. Mr. Kapanui also recalls that, "There was some controversy about the statue in front of the auditorium. That the document had something to do with—something that really wasn't what it was all about—something to do with the overthrow."
Mr. Kapua, a U.S. veteran and a McKinley High School alumnus, recommends that the truth regarding the McKinley Statue be addressed: "If not now, then when?" The statue holds a document, and the words on the document are "Treaty of Annexation": Mr. Kapua believes that a plaque should be erected in front of the statue to draw attention to the inaccuracy, thus remedying the wrong. He does not believe this is a matter of rewriting history, but instead honestly portraying the truth of history. He also believes that a plaque is more respectful and less costly than taking down the statue and fixing it.

Table 10. Genz & Hammatt (2010) Results of Community Consultations

Genz & Hammatt (2010:ix-xi)
1. *Wahi pana* and *mo'olelo* associated with the Project vicinity reveal a strong connection to past traditions and a renewed salience of those traditions today. Mr. Kapanui explains that Hawaiians traditionally dedicated newly constructed *heiau* to the war god Kū and other primary male gods and christened special events with human sacrifices. He shares a *mo'olelo* of sacrificial drowning at the waters of Kewalo Basin and an inland pond located at the Blaisdell Center, a story that Mr. Kapanui uses today to enrapture visitors. According to Mr. Kapanui, *ali'i* (chiefs) associated with two sacrificial *heiau*— Kānelā'au Heiau on the slopes of Punchbowl Crater and a *heiau* near the former coastline at the Kawaiaha'o Church—required that members of the low *kauwā* caste were strangled underwater to ensure the victim's body remained intact without excessive blood and bruises.

Genz & Hammatt (2010:ix-xi)
2. The identity of the descendents of former Kakaʻako residents is influenced by *moʻolelo* of the area as a place of coral flats, landfill, dumps, disease, and death. Mr. Kapanui describes how the smallpox epidemic of 1853 ravaged Hawaiʻi. According to Mr. Kapanui, over 3,000 small pox victims were buried in mass graves near the former coastline at Restaurant Row and the old Kakaʻako Fire Station. Older firemen have shared with Mr. Kapanui their experiences of ghost haunting there.
3. *Kamaʻāina* of Kakaʻako fondly reminisce about the diverse ethnic neighborhoods of Kakaʻako and the recreational use of the waterfront during the 1930s and 1940s. A confidential participant portrays the vibrant and interactive character of the Japanese, Chinese, Filipino, and Portuguese immigrant families. Mrs. Kekina remembers swimming in the harbor and cove of Kewalo Basin and nearby reefs.
4. Despite intense dredging and land reclamation in Kakaʻako, knowledge of *lāʻau lapaʻau* (traditional plant medicine) and customs of gathering plants for medicinal and agricultural purposes continue to be passed on by Hawaiians of Kakaʻako. A confidential participant explains in detail the collection, preparation, and medicinal uses of the following plants: *ʻuhaloa*, castor beans, guava, *pōpolo*, *tī*, and *māmaki*, as well as the gathering and consumption of several types of *limu* (seaweed), including *limu ʻeleʻele*, *limu ogo*, and a type of *limu* that grows on *ʻopihi* (limpets) (see Appendix B for common and scientific plant and animal names mentioned by community participants).
5. The historic era of *aku* fishing and *sampan* of Kewalo Basin still resonates with community members today. Mrs. Kekina gives a voice to the few remaining descendents of the original Japanese immigrant fishermen of the early twentieth century. Her father worked as the shipyard foreman for Hawaiian Tuna Packers and built *sampan* boats for *aku* fishing. Mr. Moses describes the small, vibrant community of *aku sampan* fishermen in the late 1960s. The crew regularly gathered on the shore of the harbor on the present-day eastern parking lot and later in a small building near the harbor entrance (now used by the charter school Hālau Kū Māna) to repair their nets, which reached lengths of 200-300 yards. Several fishermen continue to practice the swiftly declining unique maritime tradition of *aku sampan* fishing. Mr. Nihoa and Mr. Moses describe the unique specificity of the Japanese-designed *sampan aku* boats and detail the techniques of *aku* fishing.
6. The waters of Kewalo Basin once contained numerous reef fish. Mrs. Kekina fished at the Kewalo Cove for menpachi, which her mother then cooked for an exceptional recipe of miso soup and a confidential participant caught several reef fish at Kewalo Basin, including *ʻāweoweo*, *manini*, *ʻōpelu*, *āholehole*, *ʻamaʻama*, and squid (octopus).
7. According to Mr. Iwami, the charter school Hālau Kū Māna leases the old net house at the Kewalo Basin Park and maintains a garden near the harbor channel of at least 13 native Hawaiian plant species. (See Section 9.2 for Hawaiian and scientific names of these plants as they appear on labeled signs).
8. Traditional Hawaiian culinary practices live on for *kamaʻāina* of Kakaʻako. A confidential participant explains the preparation of pigs and fish for *lūʻau* (feasts). In addition, Mr. Nihoa and Mr. Moses continue the practice of drying *aku* at sea for home consumption. The boat they work on is evidence of the continued consumption of fresh *aku* as well.
9. A tight-knit intense social community of surfers has emerged at "Kewalos," a series of four surf breaks adjacent to the harbor entrance in front of the Kewalo Basin Park. Mr. Iwami describes the meanings of the surf breaks (Marine Land, Straight Outs, Rennicks/Right Next, and the Point), as well as the neighboring body surfing break located west of the harbor channel in front of the Kakaʻako Waterfront Park (Point Panic). Mr. Iwami suggests that the excellent surfing conditions, the short section of oceanfront land, and the single entrance to the park have contributed to the enduring social bonds of the Kewalos surfers.
10. The respondents are not aware of any cultural or historic properties, including *ilina* or *iwi kūpuna*, within or adjacent to the current Project area. However, Mr. Moses and Mr. Nihoa highlight the cultural significance of the *Kula Kai*, the last of the original wooden *sampan aku* boats in Hawaiʻi which was built just after World War II and is docked at Kewalo Basin.

Table 11. Elison & McElroy (2011) Results of Community Consultations

Elison & McElroy (2011:70-102)
1. Traditional Sites: Kawaiahaʻo was verified as a pre-Contact Hawaiian site; *heiau* of Pākākā was located in Kuloloia
2. *Moʻolelo*: several *moʻolelo* (mostly of the spooky variety) were relayed about Kakaʻako: the graveyard area by Kawaiahaʻo Church was associated with apparitions of a white horse and horseless man; in a vacant lot near the residential area, supernatural fireballs were observed by several inhabitants
3. Traditional name for the Elison and McElroy (2011) project area: Kuloloia Waterfront, Stream, Harbor, and Reef (referencing several books, quotes, and annuals written on the subject); also Kuloloia as the location that was sovereign, according to Bernice Pauahi Bishop; and referenced in a speech by Lunalilo: "…from the Waters of Keomo struck the first blow on Big Island to the *hui lokahi ana o na Mokupuni i ke kai o Ku-loloia* – everybody coming together building the government at the *kai* of Kuloloia…" (Elison and McElroy 2011:73); Historic era news article talked about the *awa* (bay) of Kuloloia and a ship named Mohongo going into the bay; Kuloloia also had famous markets, named Pakele or Hui Pakele and Hui Kalepa Hoʻokuonoono Hawaiʻi
4. *Oli*: Kakaʻako, Kālia, Māmala, and Kuloloia mentioned in numerous chants that can be found in the Bishop Museum
5. Burials: Kakaʻako in general and specifically the Elison and McElroy (2011) project area said to have *iwi kūpuna*; many Native Hawaiians in Kakaʻako were destitute and subsequently fell victim to epidemics in mid-1800s and buried near to where they lived; on Keʻeaumoku Street there is make-shift cemetery for 250 people that died during epidemics; various areas may contain disarticulated *iwi kūpuna* from this era; Kakaʻako has areas where sediment contains disarticulated human remains from periods of high mortality due to epidemic; various locations of known and unknown burials throughout area; areas of fill may also contain *iwi kūpuna;* unauthorized and unmarked burials may be located at Kawaiahaʻo Cemetery, as it was regarded as a *puʻuhonua*; Ala Moana Park said to have mass burial from smallpox epidemic;
6. *Limu*: Kakaʻako was verified as a location to pick *limu* (*limu ʻele ʻele* was gathered in the location of where Pier 2 is today, which was a park next to the immigration depot); *ʻopihi* and *hāʻukeʻuke* (*Colobocentrotus atratus*) also gathered in Kakaʻako; *limu lipoa* and *limu waiwaiole* was gathered in Kakaʻako, which would be added to poke; some interviewees were warned against collecting *limu* from areas in Kakaʻako that may have motor oil in the water
7. Agriculture: rice paddies and *loʻi kalo* (dry land variety) existed in the area for subsistence agriculture of local families; growing *kalo*, ti leaves, and sweet potato as well as raising pigs and chickens were common forms of subsistence living in Kakaʻako; people grew *kalo* to make their own poi
8. *Paʻakai*: Kakaʻako verified as a location that one could obtain *paʻakai* (salt)
9. Fishing: locations consist of Kewalo area, Kakaʻako area, Fisherman's Wharf, Ala Moana Park, Sea of Kuloloia, from Honolulu Harbor to Ala Moana Park, and open ocean off of Kakaʻako; pole fishing, net throwing, torch fishing, spearing, and boat fishing; wide variety of fish and marine invertebrates caught in Kakaʻako: *manini*, *mamo*, menpachi, *weke*, *ʻupāpalu*, *kūmū*, *palani*, *uhu*, as well as squid, *tako*, and crab
10. Post-Contact Sites: *hale* of Kamehameha I located on the shore of Kuloloia as well as the fort and Wharf of James Robinson; European cemetery on King Street along Kawaiahaʻo to Mission Lane;
11. Demographics: Kakaʻako had a dense population of displaced Hawaiians in mid-1800s; Honoakaha Housing Project was located where the Honolulu Brewery is located; Near the marshland of where Ala Moana Center was a community of nearly 90% Hawaiians called Ala Moana Hawaiian camp; Kakaʻako was primarily a blue-collar community; Kakaʻako became very ethnically diverse with Portuguese, Hawaiians, Japanese, Okinawan, Chinese, and Filipinos typically living in sub-communities (camps), though some areas, such as Magoon Block were mixed ethnicity communities

Elison & McElroy (2011:70-102)
12. Swamp area: the area that became Lewers & Cooke lumber yard; Ala Moana Park was previously swamp area; *mauka* of Ala Moana Mall were duck ponds and taro patches; beach leading to "Bowls" surf break was swamp; area that is now Sears was swamp and forest with no streets; Ala Moana Center was all marshland; the marshland had a lot of mud hens, ducks, and wild birds
13. Trails: there were many trails leading to the Ala Moana Park area
14. Transportation: bus and streetcar (also referred to as the trolley); people walked everywhere, since cars were not affordable for most Kakaʻako locals; the train was used by Kakaʻako locals, leaving from Aʻala to other areas of the island
15. Work: many Kakaʻako residents also worked in Kakaʻako, at such places as the City and County Road and Refuse Divisions (Incinerator), Honolulu Iron Works, and from home or relatives houses making *leis*
16: Housing: E.E. Black, Mr. Kamalae, Enoko Kealoha, and Jack Magoon were either property owners or property managers of many rental homes in Kakaʻako who primarily rented to Hawaiians; many Hawaiians rented in Kakaʻako; Dillingham, Castle & Cooke, and Ward owned most of Kakaʻako; tenement housing from Queen Street to Ala Moana Blvd.; Magoon Block had small residential cottages; Squattersville was behind the Incinerator; Don Ho lived in Squattersville; residential areas became commercial and industrial
17. Local Business: Piggly Wiggly's Super Market; Miwa Store; the animal hospital was on Kapiʻolani Blvd. (no name given); Honolulu Laundry; Lewers & Cooke lumberyard; Aiʻs gas station; Kodak Hawaii; KGMB station; horse stable and small racetrack at the end of Kawaiahaʻo; Kewalo Inn; potato chip factory; John Dominis Restaurant; Royal Brewery; Mexican Restaurant (no name given); Mi P.Y. Chong restaurant; Mr. Christian's restaurant; strip club between Ward and Piʻikoi Streets (no name given); Kewalo Theatre; American Sanitary Laundry; Primo Beer Company on Cooke and Kawaiahaʻo Streets; Honda Store
18. Houses of Worship: Kawaiahaʻo Church, Lamb of God Pentecostal Church; St. Agnes Church; Holy Ghost Church; Buddhist Temple
19. Recreation: open air theatre; Kewalo Theatre; Kakaʻako locals often camped in tents at Squattersville on the weekends; Mother Waldron Neighborhood Park sports (basketball, baseball, softball, football, volleyball); Mother Waldron Neighborhood Park live music on Saturday Nights; Thomas Square had tricycle races; swimming and surfing at various locations (Point Panic and Atkinson Drive); various children's games (broomstick games, walking on tin cans, tube rolling, sand bag games; picnicking;
20. Resources: property on Pensacola Street, next to McKinley High School had a stream with mullet as well as coconut trees; date trees on Queen Street; Kawaiahaʻo graveyard had many fruit trees, including mango and soursop; some Kakaʻako residents made alcohol out of pineapple and rice;
21. Community Events: Holy Ghost Days (Portuguese Catholic festival) put on by Holy Ghost Society, had a bazaar and sold malasadas; election season booths with food and entertainment at Ward and Waimanu Streets;
22. Music, Hula, & Kanikapila: many famous musicians hailed from Kakaʻako, including Aunty Genoa Keawe, Gabby Pahinui, Don Ho, Danny Kaleikini, and Chris Kamaka; Saturday Night Kanikapila at Mother Waldron Neighborhood Park; park near Pohukaina was where Portuguese gathered to sing harmonies together; Honolulu Girls Glee Club was a hula and music troupe led by Amelia Guerrero located in Kakaʻako
23. Neighborhood Culture: everyone was *ʻohana*; sharing was expected; respect for other's property and resources (e.g. no trespassing, no stealing; no collecting other's *limu*); Magoon block known for being very candid with each other; trusting neighbors was more common; blue-collar community; very ethnically diverse with Portuguese, Hawaiians, Japanese, Okinawan, Chinese, and Filipinos typically living in sub-communities (camps), though some areas, such as Magoon Block were mixed ethnicity communities; some friction between ethnicities and racism existed

Elison & McElroy (2011:70-102)
24. Changing Shoreline: much less freedom to access water and shorelines as Hawaiians did in pre-Contact era; shoreline was further out (by filling with rubbish); houses and coral gravel beaches where the Ilikai is located; shore had more boats and dry-docks; surfers go further out now; Ala Wai Canal was dredged and dredged material used for land fill; Ala Moana Beach Park had a lot of canoes parked on beach; Magic Island did not exist; Ala Wai Canal was clean before and people used to catch mullet in the channel; there were salt ponds along coast; more sandy beaches now; more crowded nowadays; the water was clear and clean until the City took over and then there was rubbish all over the reef; Fort Armstrong was located on the coast near Aloha Tower
25. World War II era: martial law was implemented; food was rationed out by the military using ration cards; the military took over Ala Moana Beach Park and the entire coastline for 3 years; access to marine food resources was next to impossible due to military rule over the coastlines; Kewalo Basin used for military vessels; military dumped swill into Kewalo basin, making the water very dirty; a military warehouse was located where the Hawaiian Electric building is near Aloha Tower; local Japanese not trusted, some taken to internment camps

4.3 Previous Traditional Cultural Properties (TCP) Study

A TCP Study was conducted by Kumu Pono Associates LLC for the proposed Honolulu Rapid Transit Project (HRTP), Sections 1-4 (Maly et al. 2013). Section 4 of the HRTP TCP Study covers Areas of Potential Effect (APE), consisting of lands in the proposed rail corridor, in the *ahupuaʻa* of Kalihi, Kapālama, Nuʻuanu, Honolulu, and Waikīkī in the District of Kona, Oʻahu Island (Figure 16). This portion of the TCP Study includes ethnographic research and oral historical interviews to augment earlier cultural studies covering HRTP APE lands stretching from Kalihi to Kālia, incorporating a wide range of historical literature including resources written in the Hawaiian language and accounts recorded by early visitors and residents. Much of the Historical literature in this study is cited in verbatim quotes with original context provided. Maly et al. (2013) based their study on the writings of early residents of the study area, native lore, 1848-1920s land tenure records, 1850-1930s surveys, 1860s-1920s Boundary Commission testimonies, land conveyance records, and historical narratives from the late 1700s to the 1920s describing these lands and her people. Hundreds of late 1700s to the early 1900s documents originally written in Hawaiian were translated by Maly et al. (2013), most of which were not previously accessible to the non-Hawaiian speaking public.

In order to guide the National Register eligibility evaluation process, The SRI Foundation (2013:20-30) summarized and categorized the Maly et al. (2013) findings into five themes:

1) Places where the gods and demigods walked the land;
2) Places of ceremonial importance, tribute sites, places associated with the dead and spirit world;
3) Notable events and individuals in Hawaiian history;
4) Places of traditional resource management; and
5) Trails and boundary markers.

According to The SRI Foundation (2013) a large number of these *wahi pana* and *inoa ʻāina* fit Criterion A and Criterion B of the official National Register Eligibility criteria provided in *How to Apply the National Register Criteria for Evaluation* (National Park Service 1995:2):

- Criterion A: That are associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B: That are associated with the lives of persons significant in our past;
- Criterion C: That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D: That have yielded, or may be likely to yield, information important in prehistory or history

Table 12 provides a list of *wahi pana* and *inoa ʻāina* that lie within the Kakaʻako TOD Overlay project area and are recognized as eligible for the National Register according to The SRI Foundation's Section 4 Management Summary (2013:Tables 1 and 6). A series of maps exhibiting *wahi pana*, *iwi kūpuna*, and archaeological sites identified prior to and during the TCP Study and Archaeological Inventory Study (AIS) were also provided in Section 4 of the HRTP (SRI Foundation 2013: Appendix E-1 through E-4).

In addition, the TCP Study included an oral history and consultation component (Maly et al. 2013: Appendix D), which was prepared by Mina Elison (2013). This supporting document of the TCP Study includes insights from eight cultural informants regarding areas within Section 4 of the HRTP that were obtained via interview, email, or telephone (Elison 2013). Selected references to *inoa ʻāina* and *wahi pana* from interviews and other communications were provided in Elison (2013:10-13). Table 13 lists the references that pertain to areas within or adjacent to the Kakaʻako TOD Overlay project area.

Figure 16. TCP Study Project Corridor, Showing Section 4 (Courtesy of The SRI Foundation and Kumu Pono Associates LLC 2013).

Table 12. Maly et al. (2013) *Wahi Pana* and *Inoa ʻĀina* identified through Archival Research (adapted from The SRI Foundation 2013: Tables 1 & 6)

Maly et al. (2013)			
Name	**Description**	**National Register**	**Theme**
Hale Kauwila (House made of Kauwila wood) (see also Kauila)	Historical name given to area adjoining Pākākā and the old Fort, and the street which bears the name Hale Kauwila (Kuloloia shoreline section). The name was given to one of the large thatched structures built in the 1820s by the Chiefs, and was the place where the King, his Council, Governor/Judge Kekuanaʻoa, the Legislature, Board of Land Commissioners and many other offices of the Kingdom met. It was at this place that many of the major decisions of the Hawaiian Government were made (Ii 1959; Kamakau, 1961). It was this structure that gave rise to naming Hale Kauwila Street. (Register Map No.'s 241, 242, 864, 1910, 1955 and 2609). In another example, Brigham (1908:111) recounts an 1837 meeting that took place at Hale Kauwila ("council chamber"). The meeting involved the King, Kauikeaoluli (Kamehameha III), his sister Nahiʻenaʻena, his wife Kalama, Boki and other chiefs and representatives of France, England, and the United States. Hale Kauwila was a thatched house built of Kauwila wood. The rafters were taken from the sacred house of Līloa at Wai-pio, Hawaiʻi, a burial place of chiefs (Pukui et al. 1974) Kauila wood is associated with the akua Kū thus imbuing the Hale Kauwila with sacred qualities associated with the god.	**Criterion A**: Associated with pattern of traditional ceremonial use relating to governance; **Criterion B**: Associated with the akua Kū. Associated with historical figure King Kauikeaoluli (Kamehameha III)	2,3
Hale o Lono (House of Lono)	A heiau, and for a time, the residence of Liholiho (Kamehameha II), once situated at the area marked by the corner of Fort and Queen Streets. (Ii 1959; Rockwood 1957)	**Criterion A**: Associated with pattern of traditional ceremonial use; **Criterion B**: Associated with pattern of traditional ceremonial use	2,3
Honokaʻupu (Albatross Bay) (see also Kauanonoʻula)	A coastal land situated west of Kuloloia. Named for a chief and husband of Kauanonoʻula. The Hale Hui and Hale Kāʻili (houses of the gods) were situated here in the area between what is now Queen and Merchant Streets. The ancient trail from Waikīkī, joined the trail of Honuakaha and continued to Honokaʻupu, where a noted fresh water spring was situated, and continued on the ʻAiʻēnui. (Īʻī 1959, Rockwood 1957; Register Map No. 900)	**Criterion A**: Associated with pattern of traditional land use for transportation – trails. Associated with pattern of traditional resource use – spring water; **Criterion B**: Associated with chief Honokaʻupu	3, 4, 5

Maly et al. (2013)			
Name	**Description**	**National Register**	**Theme**
Honuakaha (Marked earth or Coastal land)	A land area bounded by Queen and Punchbowl Streets, once the site of an important coconut grove; former residence of Kinau (k.) father of Chiefess M. Kekauonohi. (Ii 1959; Rockwood, 1957; Māhele Claims 677, 680, 683 and 729; Register Map No.'s 241, 611 and 900). Property described in association with trails in the Kona District. "Let us return to where the trail from Waikīkī met the trail from Honuakaha, mauka of the Honokaʻupu spring." See Maly et al. (2013:106). Kekauonohi was a noted historical figure, granddaughter of Kamehameha I, married to Liholiho. See Maly et al. (2013:106).	**Criterion A**: Associated with pattern of traditional land use for transportation – trails; **Criterion B**: Associated with historical figures Kinau and Chiefess M. Kekauōnohi	3, 5
Hoʻokūkū (To compete)	Area between Honuakaha and Honokaʻupu, now covered by Queen Street. Healing heiau and a residence of Liholiho were situated here. (Ii 1959; Rockwood 1957). Property is associated with Liholiho (his residence), the trail between Kālia and Kukuluāeʻo, and the Papa *heiau* along the trail. See Maly et al. (2013:105).	**Criterion A**: Associated with pattern of traditional ceremonial use. Associated with pattern of traditional land use for transportation – trails; **Criterion B**: historical figure King Liholiho (Kamehameha II)	2, 3, 5
Kākāʻako (Strike and gather)	A land area, ancient fishing village and historic community, situated between Honuakaha and Kaholoakeāhole. In the historic period, a section of the land was used as a quarantine for plague victims. (Ii 1959; Rockwood 1957; Māhele Claims 3455 and 4457; Register Map No. 900). Property is named in the tradition of ʻAiʻai, son of Kūʻula (fish god). See Maly et al. (2013:59).	**Criterion B**: Associated with the *akua* ʻAiʻai, son of Kūʻula (fish god)	1
Kālia (Waited for)	An *ʻili* land of the coastal region of Waikīkī, noted for its numerous salt works and fishponds. "The trail from Kālia led to Kukuluaeo" (Ii 1959; Pukui et al. 1974; Māhele Claims 97 F.L., 100 F.L., 101 F.L., and 387; Register Map No.'s 111 and 1090). Property is associated with chief Hua-a-Kamapau and Kamehameha I (Maly et al. 2013:99).	**Criterion A**: Associated with pattern of traditional resource management. Associated with pattern of traditional land use for transportation – trails. **Criterion B**: Associated with the Chief Hua-a-Kamapau	1,2,3
Kaʻoaʻopa (meaning undetermined)	Coastal section of land between Mokuʻaikaua and Honuakaha. Area crossed by the trail from Honolulu to Kākāʻako and beyond, where attendants of Liholiho resided in the time of Kamehameha I. (Ii 1959; Rockwood 1957; Māhele Claims 19 and 129). See Maly et al. (2013:105).	**Criterion A**: Associated with pattern of traditional land use for transportation - trails	5

Maly et al. (2013)			
Name	**Description**	**National Register**	**Theme**
Kewalo (The calling)	A kula land and coastal region, noted for its fish and salt ponds. There was once a famous spring at Kewalo near the ponds, where victims of sacrifice at Kānelāʻau Heiau on the slopes of Pūʻowaina were first drowned. "The priest when holding the victims head under water would say to her or him on any signs of struggling, "*Moe malie i ke kai o ko haku.*" "Lie still in the waters of your superior." From this it was called "Kawailumalumai," "Drowning waters" The law under which the sacrifices were made, was called Kekaiheheʻe. (Māhele Claims 97 F.L., 100 F.L., 101 F.L., 387, 1503, 1504 and 10605; Register Map No.'s 111, 611 and 1090).	**Criterion A**: Associated with pattern of traditional resource management. Associated with pattern of traditional ceremony relating to ritual sacrifice.	2,4
Kolowalu (An ancient law)	A section of land in Kukuluāeʻo, and adjoining Kālia. During the reign of Kūaliʻi, the "Royal Kolowalu Statute" was declared for the "preservation of life," making it safe for people to travel the trails, and to be respectfully treated (Fornander 1917; Māhele Claim 3142; Register Map No.'s 111 and 1090) Kolowalu is connected by trails that cross Waikīkī and the Honolulu Region. See Maly et al. (2013:92).	**Criterion A**: Associated with pattern of traditional land use for transportation – trails; **Criterion B**: Associated with historical figure Chief Kūaliʻi	3,5
Kou (Cordia tree)	Said to be the ancient name of what is now called Honolulu. (Various features and named localities cited in traditions and historical accounts; Māhele Claims; and various Register Maps). Kou was noted for *kōnane* [Hawaiian checkers] and for *ʻulu maika* [an ancient game likened to lawn bowling] and said to be named for the *Ilamuku* (executive officer) of Chief Kūkuhihewa of Oʻahu. See Maly et al. (2013:7).	**Criterion A**: Associated with pattern of traditional ceremony relating to the Makahiki Seasonal ritual; **Criterion B**: Associated with historical figure Chief Kākuhihewa	2,3
Kōʻula (Red sugar cane)	Kō ʻula and Kewalo were lands which the ancient chief Hua, caused to be cultivated. Hua was known as a chief who cared for his people (S.M. Kamakau, 1865). Land section covering the Catholic burying ground and the Ward family's, "Old Plantation". Kōʻula is name given to lands cultivated by Hua. See Maly et al. (2013:52).	**Criterion B**: Associated with historical figure Chief Hua	3
Kukuluāeʻo (The Hawaiian stilt)	A near shore land area in the Kākāʻako vicinity, traditionally a detached parcel belonging to Punahou of Waikīkī. "This was a famous place in ancient times, and the heiau was Puʻukea" (Kamakau 1865). Noted for its fish and salt ponds. (Māhele Claims 97 F.L., 387, 982, 1503, 7712, 10463 and 10605; Register Map No.'s 111, 611, 1090 and 1471). Property is also linked with Hua-a-Kamapau, the chief of Honolulu/ Waikīkī, through reference to the Puʻukea heiau. See Maly et al. (2013:82).	**Criterion A**: Associated with pattern of traditional ceremonial use. Associated with a pattern of traditional resource management; **Criterion B**: Associated with historical figure Chief Hua-a-Kamapau	2,3,4

Maly et al. (2013)			
Name	**Description**	**National Register**	**Theme**
Kuloloia (also written Kuloloio)	Once a beautiful sandy beach on the shore of Kou, and a favored residence of the high chiefess Nāmahana (wife of Keʻeaumoku, and mother of Kaʻahumanu and other significant figures in the Hawaiian Kingdom). There were a number of chiefly houses and heiau spread across the shoreline of Kuloloia, between Pākākā and Honuakaha. Nāmahana died at her home on the shore of Kuloloia, and "A younger cousin of Namahana's children, who was present at her death, was named Kuloloia for the place in which Namahana died." (Ii 1959; Rockwood 1957). Also named in tradition of ʻAiʻai, son of the fishing god Kū-ʻula. See Maly et al. (2013:13).	**Criterion A**: Associated with pattern of traditional ceremonial use; **Criterion B**: Associated with historical figures: The high Chiefess Nāmahana wife of Keʻeaumoku, and mother of Kaʻahumanu. Associated with deity ʻAiʻai, son of the fishing god Kūʻula	1,2,3
Mauna Kilika (Silk Mountain)	Named for the mounds of silk cloth traded by foreigners in exchange for Hawaiian products. Area of the former residence of chief Kekuanaʻoa, Governor of Oʻahu under Kamehameha III; and situated along the shore of Kuloloia. Area was later called Hale Kauwila, and is the source of the street with the same name (Register Map No. 900).	**Criterion B**: Associated with historical figure Chief Kekuanaʻoa, Governor of Oʻahu	3
Pākākā (To skim, as stones over water)	Site of an ancient heiau of human sacrifice, dedicated to the god Kūhoʻoneʻenuʻu (Westervelt 1915). Later the site of the Fort of Honolulu, and residence of chiefs. In the historic period, the site was developed into "Robinson" wharf on the western side of Hale Kauwila Street; and later filled in. (Ii 1959; P. Rockwood Map, 1957; and Register Map No.'s 241, 242, and 900).	**Criterion A:** Associated with pattern of traditional ceremonial use; **Criterion B**: Associated with the *akua* Kūhoʻoneʻenuʻu	1,2
Puʻukea (White hill) See also **Kukuluāeʻo**	An ancient heiau built for or by, Hua-nui-ka-lā-laʻilaʻi, a hereditary chief of Oʻahu, who was born at Kewalo (Kamakau 1865:22; Pukui & Ebert 1992). Also associated with the ancient Chief Luanuʻu who was taken there when he was dying. See Maly et al. (2013:85).	**Criterion A:** Associated with pattern of traditional ceremonial use; **Criterion B**: Associated with historical figure Chief Hua-nui-ka-lā-laʻilaʻi and ancient Chief Luanuʻu	2,3
Waikahalulu (Roaring water)	An *ʻili* land, the upper section being where the goddess, Papa, embraced her husband Wākea, who was being taken to be sacrificed at Pākākā Heiau, and changed into the form of an *ʻulu* (breadfruit tree). This *ʻulu*, became known as the deity, Kāmeha'ikana, who had the power to overthrow governments. Kāmehaʻikana was a god called upon by Kamehameha I in his conquest of the islands (Kamakau 1991). The land area includes the section between Nuʻuanu and Pauoa streams, and a section on the shore, below Hale Kauwila St., where it joins the sea at ʻāina Hou, and adjoining Kuloloia and Kaʻākaukukui (Kamakau 1961; Māhele Claim of H. Kalama & Claim No.'s 7712, 11219 and 11225; Register Map No.'s 242, 244, 305, 611, 861, 900, 1090 &1471).	**Criterion B**: Associated with the *akua* Papa and Wākea, and the deity Kāmehaʻikana	1

Table 13. References to *Wahi Pana* and *Inoa ʻĀina* of Kakaʻako in Elison (2013)

Elison (2013)		
Name	**Comments**	**Informant**
Kākāʻako (Strike and gather)	• "...all of Kākāʻako is a "sensitive" area ..." (AK) • The song "Henehene Kou Aka" is about a courtship that took place during a bus ride that ends in Kakaʻako. (FG) • Kakaʻako was a place to collect *limu*. (FG) • Kakaʻako was marshy before development and people could hunt mudhens and other wild birds. (DL) • Kakaʻako had street festivals such as the Portuguese Holy Ghost Festival, fair events and food during election season (DL) (VD)(WH) • Kanikapila and various sporting events at Mother Waldron Neighborhood Park. (DL) • Graveyards and unmarked burials are encapsulated by fill in Kakaʻako. (DL)(WH) • Mother Waldron Park is an important sports and recreation hub for the Kakaʻako community. (DL)(VD) • There is high probability that *iwi kūpuna* will be encountered in the Kakaʻako area. (DS)(WH) • Kakaʻako had sand dunes in the distant past. (DS) • Kakaʻako in the 1940s had a large population of Hawaiians, but Portuguese, Asian, and Filipino working-class families also lived there (VD)(WH) • Incinerator was located at the John Dominis Restaurant in Kakaʻako (VD)(WH) • Thomas Park in Kakaʻako used to have tricycle races (VD) • Kawaiahaʻo Church in Kakaʻako was where people gathered to play Hawaiian music and hula (VD) • Many Hawaiian musicians and dancers hailed from and practiced in Kakaʻako (VD)(WH) • Residents of Kakaʻako kept small dry land sweet potato and *kalo* patches and pounded their own poi, they also grew ti for making *laulau*.(WH) • Squattersville was located in Kakaʻako Makai (WH) • Kawaiahaʻo Church in Kakaʻako was where families would spend some of their Sundays visiting buried relatives and relaxing. (WH) • Two theatres were important venues for Kakaʻako's community (WH) • A horse stable and small racetrack was once located in Kakaʻako (WH) • Some residents of Kakaʻako raised pigs and chickens (WH)	• Adrian Keohokalole (AK) • Francine Gora (FG) • Douglas Lapilio (DL) • Dexter Soares (DS) • Van Horn Diamond (VD) • William "Bill" Papaiku Haole, Jr.(WH)
Kālia (Waited for)	• Fishponds were located in Kālia, one of which supplied Kamehameha I with his favorite type of fish to eat. (PK) • Near Kālia was also Kamehamehaʻs *loʻi* which he constructed and cared for while on Oʻahu. (PK) • Kaleikini ʻOhana lands in Kālia include Loko Kūwili, once adjacent to the Hawaiʻi Convention Center, but was dredged through in the construction of the Ala Wai Canal. (PK) • Kālia is the name of a region. The Ala Moana Shopping Center is located on a portion of Kālia. (DL) • A Hawaiian Camp was located in Kālia where the Ala Moana Shopping Center is located. (DL)	• Paulette Kaʻanohi Kaleikini (PK) • Douglas Lapilio (DL)

Elison (2013)		
Name	**Comments**	**Informant**
Kewalo (The calling)	• Japanese fished in Kewalo Basin and aku boats (sampan) moored in Kewalo Basin. (DL) • Various surf breaks exist along the south shore of Kewalo Basin. (WH) • Water was much cleaner than it is today at Kewalos. (WH) • Kewalo Inn, which served Hawaiian and local food, was located on the property that Ward Center is now located. (WH)	• Douglas Lapilio (DL) • William "Bill" Papaiku Haole, Jr.(WH)
Kou (Cordia tree)	• The song "Henehene Kou Aka" is about a courtship that took place during a bus ride from Kalihi to Kakaʻako, passing through Kou. (FG)	• Francine Gora (FG)
Kukuluāeʻo (The Hawaiian stilt)	• The area in which Puʻukea Heiau once stood. (PK) • Location of Kukuluāeʻo pointed out on map. (RF)	• Paulette Kaʻanohi Kaleikini (PK) • Randie Fong (RF)
Pākākā (To skim, as stones over water)	• Several heiau which date to the 1500s were located in Honolulu, including Pākākā Heiau, which was located at the foot of Fort Street in downtown Honolulu. (• Within the vicinity of Pākākā Heiau was an *aliʻi* complex which also served as the residence of Kamehameha I from 1809-1812.	• Paulette Kaʻanohi Kaleikini (PK) • Randie Fong (RF)
Puʻukea (White hill)	• Puʻukea Heiau was located in the area of Kukuluaeo which is now the location near Halekauwila and Cooke Streets. Most likely named after the *heiau* respective ʻili of the same name, Puʻukea. Kaleikini traces her lineage to the chief who is associated with the construction of this heiau.	• Paulette Kaʻanohi Kaleikini

4.4 Identified Cultural Groups, Practices, and Resources Summary

Numerous cultural groups, practices, and resources were identified by Wilson Okamoto and Associates, Inc. (2002), Spearing et al. (2008), Vogeler et al. (2010), Genz and Hammatt (2010), Elison and McElroy (2011), Maly et al. (2013), and Elison (2013) for the Kakaʻako TOD Overlay project area. In general, cultural groups included Native Hawaiians as well as a few *kamaʻāina* and cultural practitioners belonging to various ethnic groups and groups of mixed ethnicities. Cultural practices identified in the CIAs and TCP Study consisted of a number of traditional Hawaiian activities as well as activities that bind other cultural and ethnic groups together. In general, traditional Hawaiian activities were not reported as currently being practiced in a traditional context, perhaps due to drastic environmental changes and large-scale development, yet some survive and other cultural groups have developed unique cultural practices in the wake of urban development. These reviewed reports demonstrate that in the distant past, there was an abundance of tangible cultural resources, such as an array of fish, plants, salt, and ceremonial sites in the project area. Currently, some of those resources are available in a handful of locations, but far less in quantity. However, intangible resources are still felt by Native Hawaiians who identify with these *wahi pana*, as *moʻolelo* and ceremonial practices imbue the cultural landscape with the *mana* of their ancestors. Further, the presence of archaeological sites and *iwi kūpuna* in these lands is well documented. In contrast, non-traditional Hawaiian cultural resources were also being utilized by various cultural groups during these assessments, such as the *aku sampan* and memorials to Historic figures of Kakaʻako.

4.4.1 Identified Cultural groups

A total of 200 cultural groups, practitioners, and informants were identified between the five previously conducted CIAs and TCP Study. No cultural groups or individuals were identified in Wilson Okamoto and Associates, Inc. (2002). However, out of the 81 community members identified by Spearing et al. (2008), they received responses from 34 individuals and were able to interview 12 informants, which were comprised of residents, cultural and lineal descendents, and cultural practitioners. Twenty individuals were identified by Vogeler et al. (2010) and interviewed five out of the ten respondents. Genz and Hammatt (2010) identified 39 potential informants, consisting of community members, government agency officials, community organization representatives, cultural and lineal descendants, cultural practitioners, and residents. Six individuals of 16 respondents were interviewed for the CIA. Elison and McElroy (2011) identified 88 cultural groups and individual informants, with a total of 8 individuals participating in interviews. Elison (2013) included transcripts from 6 newly conducted ethnographic interviews, transcripts from two previously conducted ethnographic interviews (Elison and McElroy 2011), a telephone consultation summary, and information from an email consultation in the Oral History-Consultation Interview Program component of the TCP Study. Table 14 provided below lists the cultural groups, practitioners, and informants identified by the previously conducted CIAs. Appendix D provides a list of all cultural informants contacted in the previously conducted CIAs and contact logs summarizing communications between CIA preparers and informants.

Of the 200 cultural practitioners, groups, and informants identified, the grand majority were Native Hawaiians. Very few individuals representing other ethnic and cultural groups were identified or contacted for these studies.

Table 14. Cultural Groups, Practitioners, & Informants Identified in Reviewed CIA & TCP

Name	Affiliation	CIA Identifying informants	Participated
Abord, Chelsie	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Agard, Louis	Former fisherman in Kewalo Basin	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)	Yes
Ahahui, Kaʻahumanu Society	Cultural informants recognized by KD	Elison and McElroy (2011)	No
Ailā, William	Hui Mālama I Na Kūpuna O Hawaiʻi Nei	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)	Yes
Alves, Henry	Former resident of Kakaʻako 1923-1941 and Participant in the 1978 University of Hawaiʻi Oral History Study: *Remembering Kakaʻako 1910-1950.*	Spearing et al. (2008); Genz & Hammatt (2010)	Yes
Apaka, Jeff	Waikiki Community Center Kūpuna	Genz & Hammatt (2010)	No

Name	Affiliation	CIA Identifying informants	Participated
Apo, Peter	Hawaiian Cultural Consultant; MVE Pacific—Architects for Kakaʻako Makai Master Plan	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)	No
Arcalas, Cara	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Ayau, Eddie Halealoha	Cultural informant recognized by KD	Elison and McElroy (2011)	yes
Ayau, Peter	Hui Mālama I Na Kūpuna O Hawaiʻi Nei	Vogeler et al. (2010)	No
Bates, Keʻala	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Bacon, Pat Namaka	Bishop Museum Archives	Genz & Hammatt (2010)	No
Becket, Jan	Photographer of sacred sites	Vogeler et al. (2010)	No
Bosley, Bob	Diamond Head Sprinkler Company	Spearing et al. (2008)	No
Brown, Desoto	Bishop Museum Archives	Genz & Hammatt (2010)	No
Burke, Jackie Kahoʻokele	KAHEA	Vogeler et al. (2010)	No
Cayan, Phyllis "Coochie"	SHPD History and Culture Branch Chief; Cultural informant recognized by KD	Spearing et al. (2008); Vogeler et al. (2010); Elison and McElroy (2011)	Yes; referrals
Cazimero, Kanoe	Kawaiahaʻo Church Archives & Cemeteries Na Iwi Committee	Genz & Hammatt (2010); Vogeler et al. (2010)	No
Center for Oral History, UH Mānoa	Cultural informants recognized by KD	Elison and McElroy (2011)	No
Ching, Baron	Kahu for Kaniakapupu— Kauʻikeaouli's Summer Palace	Vogeler et al. (2010)	No
Chun Oakland, Suzanne	Hawaiʻi State Senator, Representing 13th District	Vogeler et al. (2010)	Yes
Confidential	Kamaʻāina of Kakaʻako	Genz & Hammatt (2010)	No
Cruz, Lynette	President, Ka Lei Maile Aliʻi Hawaiian Civic Club	Vogeler et al. (2010)	No
DaMate, Leimana	ʻAha Kiole member, father raised in Kakaʻako	Spearing et al. (2008)	No
Dang, Mike	Kewalo Development	Spearing et al. (2008)	No
Dawson, Beadie Kanahele	Played at Mother Waldron Neighborhood Park as a child; former Land attorney for the State of Hawaiʻi and City Planning Commission; practitioner of *hoʻoponopono*	Elison (2013)	Yes
Del Toro, Rachel & Samuel	Cultural informants recognized by KD	Elison and McElroy (2011)	No

Name	Affiliation	CIA Identifying informants	Participated
Diamond, Van Horn	Cultural Descendant; Cultural informant recognized by KD & SHPD	Spearing et al. (2008); Elison and McElroy (2011); Elison (2013)	Yes - Elison & McElroy (2011) and Maly et al. (2013)
Downing, George	Save our Surf	Genz & Hammatt (2010)	No
D'Olier, Mitch	Former manager of the Victoria Ward Estates.	Spearing et al. (2008)	No
Enomoto, Stanton	Office of Hawaiian Affairs, Special Assistant to the Administrator	Spearing et al. (2008)	No
Falemei, Hinaleimoana	Cultural informant recognized by SHPD; Oʻahu Island Burial Council, Vice-Chair	Elison and McElroy (2011)	Yes
Faulkner, Kiersten	Historic Hawaiʻi Foundation	Spearing et al. (2008); Genz & Hammatt (2010)	Yes
Flores, George Kahumoku	Member, Ka Lei Maile Aliʻi Hawaiian Civic Club	Vogeler et al. (2010)	No
Fong, Randie	Cultural informant from Kalihi with knowledge of Honolulu area	Elison (2013)	Yes
Freitas, Bob	Planner, Department of Hawaiian Homelands	Spearing et al. (2008)	No
Frierson, Jim	Kakaʻako Coalition, Kakaʻako small business owner	Spearing et al. (2008); Genz & Hammatt (2010)	No
Furushima, Scottie	Kewalo Keiki Fishing Conservancy	Genz & Hammatt (2010)	No
Galuteria, Brickwood	Raised in Kakaʻako	Spearing et al. (2008)	No
Garcia, Clifford	Longtime business owner of Tropical Lamp & Shade Co.	Spearing et al. (2008)	Yes
Gomes, Phoebe	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Gomes, Robin	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Gora, Francine	Na Kūʻauhau ʻo Kahiwa Kanekapolei, Koʻolaupoko Hawaiian Civic Club	Elison (2013)	Yes
Grace, Nadine K. (Takaki)	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Graff, Gwendolyn Y.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Guila-Theone, Nicole (Kaleikini)	Cultural Descendant	Spearing et al. (2008); Elison and McElroy (2011)	Via PK
Haʻi ʻOhana	Cultural informants recognized by KD	Elison and McElroy (2011)	No
Hale o Na Aliʻi o Hawaiʻi, Harriet Smith	Cultural informant recognized by KD	Elison and McElroy (2011)	No

Name	Affiliation	CIA Identifying informants	Participated
Haole, William Boysie P. III	Cultural informant recognized by KD	Elison and McElroy (2011); Elison (2013)	Referrals
Haole, William P. Jr.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Haili's Hawaiian Food	Long-time tenant in the Ward Farmer's Market	Spearing et al. (2008)	No
Hedlund, Nancy	Secretary, Ala Moana/Kakaʻako Neighborhood Board	Spearing et al. (2008); Genz & Hammatt (2010)	No
Higgins, Colette	Hawaiian historian, specializing in Queen Kapiʻolani, Kapiʻolani Girls' Home and the Kakaʻako Branch Hospital	Spearing et al. (2008); Genz & Hammatt (2010)	No
Hughes, Claire	Mother grew up in Kakaʻako	Spearing et al. (2008); Genz & Hammatt (2010)	Yes
Hui Malama I Na Kupuna o Hawaiʻi Nei, William Aila	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Huihui, Henry	Family were former residents of Kakaʻako	Spearing et al. (2008)	No
Huihui, Micky	Hālau Kū Māna	Genz & Hammatt (2010)	No
Hustace, Cedric	Descendant of Victoria Ward.	Spearing et al. (2008)	No
Iwami, Ron	Friends of Kewalos	Genz & Hammatt (2010)	Yes
Iopa, Rob	President, WCIT Architecture	Spearing et al. (2008)	No
Jones, Bob	Writer for Midweek Press	Spearing et al. (2008)	Yes
Kaʻaihue, Isaac	Cultural informant recognized by Keala Pono	Elison and McElroy (2011)	No
Kahn, Leimomi	Kamaʻāina	Spearing et al. (2008); Genz & Hammatt (2010)	Yes
Ka Hui O Malama Kakaʻako Paka	Local organization	Genz & Hammatt (2010)	No
Kai, Carole	McKinley High School alumnus, Carole Kai Charities	Vogeler et al. (2010)	No
Kai Makana	Local organization	Genz & Hammatt (2010)	No
Kaleikini, Aliʻikaua	Cultural Descendant	Spearing et al. (2008)	Via PK
Kaleikini, Kala W.	Cultural Descendant	Spearing et al. (2008)	Via PK
Kaleikini, Noʻeau	Cultural Descendant	Spearing et al. (2008)	Via PK
Kaleikini, Paulette	Recognized descendant of Kakaʻako; Kaleikini ʻOhana as cultural informants recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	Yes - only in Spearing et al. (2008)
Kaleikini, Tuahine	Cultural Descendant	Spearing et al. (2008)	Via PK
Kapanui, Lopaka	Mysteries of Honolulu, Famous storyteller, folklorist	Spearing et al. (2008); Vogeler et al. (2010)	Yes

Name	Affiliation	CIA Identifying informants	Participated
Kaopuiki, Pi‘ilani	McKinley High School alumnus	Vogeler et al. (2010)	Yes
Kamae, Eddie & Myrna	Cultural informants recognized by Keala Pono	Elison and McElroy (2011)	No
Kamai, May	Cultural informant recognized by Keala Pono	Elison and McElroy (2011)	Yes
Kamaka, Fred Sr. & Sam Jr.	Cultural informants recognized by Keala Pono	Elison and McElroy (2011)	No
Kapua, Charles	Member of Pearl Harbor Hawaiian Civic Club; Mr. Kapua’s grandfather owned a fish market in Kaka‘ako; Kama‘āina of Kewalo Ahupua‘a	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)	Yes
Keahiku, Carter Leland	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Keana‘aina, Betty	Cultural Descendant	Spearing et al. (2008), Elison and McElroy (2011)	No
Keana‘aina, Luther	Cultural Descendant	Spearing et al. (2008)	No
Keana‘aina, Kihei	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Keana‘aina, Michelle	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Keana‘aina, Noelani Luther	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Keana‘aina, Vicky	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Keana‘aina, Wilsam	Cultural Descendant	Spearing et al. (2008)	No
Keaweaheulu, Joseph M.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Kekaula, Mary Kualoku	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Kekina, Mabel	Kama‘āina of ‘Aiea. Mrs. Kekina’s father was foreman of Hawaiian Tuna Packers.	Genz & Hammatt (2010)	Yes
Kekipi, Greg	Cultural Descendant; Cultural informant recognized by Keala Pono	Elison and McElroy (2011)	Referrals
Keli‘inoi, Kalahikiola (Kaleikini)	Cultural Descendant; Cultural informant recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	Via PK in Spearing et al. (2008)
Keli‘inoi, Moani K. (Kaleikini)	Cultural Descendant; Cultural informant recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	Via PK in Spearing et al. (2008)
Keli‘ipa‘akaua, Chase K. (Kaleikini)	Cultural Descendant	Spearing et al. (2008)	Via PK
Keli‘ipa‘akaua, Justin K. (Kaleikini)	Cultural Descendant; Cultural informant recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	Via PK in Spearing et al. (2008)

Name	Affiliation	CIA Identifying informants	Participated
Keli‘ipa‘akaua, Kepo‘o	Cultural informant recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	Via PK in Spearing et al. (2008)
Keohokalole, Adrian	Cultural Descendant; Cultural informant recognized by KD & SHPD	Spearing et al. (2008); Elison and McElroy (2011); Elison (2013)	No
Keohokalole, Dennis Ka‘imi	Cultural Descendant	Spearing et al. (2008)	No
Keohokalole, Ema Emalia	Cultural Descendant; Cultural informant recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	No
Keohokalole, Joseph M. Keaweaheulu	Cultural Descendant	Spearing et al. (2008)	No
Keohokalole, Ka‘imi	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Keppeler, Bruss	Native Hawaiian Chamber of Commerce member	Spearing et al. (2008)	No
Kewalo Park Association	Local organization	Genz & Hammatt (2010)	No
Kikiloi, Kekuewa	Kamehameha Schools	Spearing et al. (2008)	No
Kini, Debbie P. K. (Norman Kaleikini)	Cultural Descendant; Cultural Descendant; Cultural informant recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	Via PK in Spearing et al. (2008)
Kini, Nalani K. (Kaleikini)	Cultural Descendant	Spearing et al. (2008)	Via PK
Kini-Lopes, Puahone K. (Kaleikini)	Cultural Descendant; Kini-Lopes ‘Ohana as cultural informants recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	Via PK in Spearing et al. (2008)
Kinilau, Eric L.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Kinilau, Evan L.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Kinilau, Elvis	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Koko, Kanaloa	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Kruse, Kehaulani	Member, O‘ahu Island Burial Council	Spearing et al. (2008); Genz & Hammatt (2010)	No
Ku, Alvin	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Ku, Bertha Kauiaa	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Ku, Dwight Lawrence	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Ku, Jacob John Jr.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Ku, Jacquelyn & Kaui	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Ku, Tercia	Cultural informant recognized by KD	Elison and McElroy (2011)	No

Name	Affiliation	CIA Identifying informants	Participated
Kuhea, G. Kealoha	Cultural Descendant; Cultural informant recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	No
Kuloloio (Kuloloia), Manuel Makahiapo	Cultural Descendant; Cultural informant recognized by KD & SHPD	Spearing et al. (2008); Elison and McElroy (2011)	Yes
Lapilio, Douglas	Cultural informant recognized by KD	Elison and McElroy (2011); Elison (2013)	Yes
Lavoie, Frank	Chairperson, Downtown Neighborhood Board	Spearing et al. (2008); Genz & Hammatt (2010)	No
Leleo, Abigail U.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Leleo, Nathan	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Leleo, Knowland	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Leleo, Sharyl	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Lee, Michael Kumukauoha	Cultural practitioner (*papakilohōkū, limu lapaʻau, & Hā*) and informant for Honolulu area	Elison (2013)	Yes
Lee, Vivien	Researcher for the 1978 University of Hawaiʻi Oral History Project Remembering Kakaʻako1910-1950	Spearing et al. (2008)	No
Lewis, Dennis	Honolulu Fire Department Historian	Spearing et al. (2008)	No
Lopes, Kamahaʻo (Kaleikini)	Cultural Descendant; Lopes ʻOhana as cultural informants recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	Via PK in Spearing et al. (2008)
Luka, Alex M.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Lum, Sam P.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Macariola, Kay	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Mamac, Violet L. (Medeiros)	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Markell, Kai	Cultural informant recognized by KD, OHA Director of Native Rights	Elison and McElroy (2011)	Yes
Matsuyama, Tainato	Cultural informant recognized by KD	Elison and McElroy (2011)	No
McDonald, Ruby (Keanaʻaina)	Cultural informant recognized by KD	Elison and McElroy (2011)	No
McKeague, Mark Kawika	Oʻahu Island Burial Council	Spearing et al. (2008); Genz & Hammatt (2010)	No
McQuivey, Jace	Chairperson, Oʻahu Island Burial Council	Spearing et al. (2008); Genz & Hammatt (2010)	No
Medeiros, David	Cultural informant recognized by KD; Medeiros ʻOhana as cultural informants recognized by KD	Elison and McElroy (2011)	No
Medeiros, Roland	Cultural informant recognized by KD	Elison and McElroy (2011)	No

Name	Affiliation	CIA Identifying informants	Participated
Mendonça, Melvin	Former McCully firefighter	Spearing et al. (2008); Genz & Hammatt (2010)	Yes
Mitchell, Samuel	Member, Makiki Neighborhood Board	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)	No
Miyasato, Norman	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Moikeha, Josephine Jr.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Moses, Ferman	*Aku* fishermen at Kewalo Basin	Genz & Hammatt (2010)	Yes
Moses-Hukiku, Clarence Andres	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Moore, Paulette	Family owned a home in Kakaʻako	Spearing et al. (2008)	Yes
Muller, Zoeann L.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Nabarro, Doris	Owner of Tsukenjo Lunch House on Cooke St., which started in 1959 as a saimin stand.	Spearing et al. (2008)	No
Nakayama,Perry	Researcher for the University of Hawaiʻi Oral History Project Remembering Kakaʻako 1910-1950	Spearing et al. (2008)	No
Nāmuʻo, Clyde	Administrator, Office of Hawaiian Affairs	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)	Yes
Nicol, Brian	Former editor-in-chief at Honolulu Magazine which featured a piece on Kakaʻako	Spearing et al. (2008)	No
Nihoa, Solomon	*Aku* fishermen at Kewalo Basin	Spearing et al. (2008); Genz & Hammatt (2010)	Yes
Nishimoto, Warren	Director, Oral History Center, University of Hawaiʻi	Spearing et al. (2008)	No
Norman, Carolyn D.K. (Kaleikini)	Cultural Descendant; Norman ʻOhana as cultural informants recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	Via PK in Spearing et al. (2008)
Norman, Eileen (Kaleikini)	Cultural Descendant; Cultural informant recognized by KD	Spearing et al. (2008); Elison and McElroy (2011)	Via PK in Spearing et al. (2008)
Norman, Kaleo K. (Kaleikini)	Cultural Descendant	Spearing et al. (2008)	Via PK
Norman, Keʻala	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Norman, Keliʻinui K. (Kaleikini)	Cultural Descendant	Spearing et al. (2008)	Via PK
Norman, Theodore R. K. (Kaleikini)	Cultural Descendant	Spearing et al. (2008)	Via PK
Oda, Bob	Kamehameha Schools	Spearing et al. (2008)	No

Name	Affiliation	CIA Identifying informants	Participated
Okada, Noelani Charmine	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Olds, Nalani	Cultural informant recognized by SHPD	Elison and McElroy (2011)	No
Paik, Linda Kaleo	State Historic Preservation Division, History and Culture Branch, Cultural Specialist	Spearing et al. (2008)	Yes
Panui, Charles Jr.	Cultural informant recognized by KD	Elison and McElroy (2011)	Referrals
Panui, George	Cultural informant recognized by KD	Elison and McElroy (2011)	Yes
Papa, Likeke	Cultural informant recognized by SHPD	Elison and McElroy (2011)	No
Pascua, George	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Peahi, Curtis	Honolulu *kamaʻāina*, McKinley High School alumnus	Vogeler et al. (2010)	No
Ponimoi, Dean	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Panimoi, James K. Jr.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Ponimoi, Frank	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Rash, Regina H. (Keanaʻaina)	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Recca, Regina	Ke Alaula o ka Mālamalama	Spearing et al. (2008); Genz & Hammatt (2010)	No
Romero, Julia Puaala	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Royal Order of Kamehameha I, Kūhiō Chapter	Cultural informants recognized by KD	Elison and McElroy (2011)	No
Save Our Kakaʻako Coalition	Affiliated with Friends of Kewalos	Genz & Hammatt (2010)	No
Seeling, Terry	Honolulu Fire Department Information Office	Spearing et al. (2008)	No
Soares, Dexter	Cultural Descendant	Elison (2013)	Yes
Stender-Jenkins, Leimomi	Hawaiian Studies teacher at McKinley High School	Vogeler et al. (2010)	No
Stevens, Anne	Chairperson, Ala Moana/Kakaʻako Neighborhood Board	Spearing et al. (2008); Genz & Hammatt (2010)	No
Steelquist, John	Chairperson, Makiki Neighborhood Board	Spearing et al. (2008); Genz & Hammatt (2010)	No
Summers, Leola B.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Suzuki, Kimberly K. & Ashley	Cultural informants recognized by KD	Elison and McElroy (2011)	No
Sylva, Nancy	Hui Ohana o Maunalaha	Genz & Hammatt (2010)	No

Name	Affiliation	CIA Identifying informants	Participated
Takaki, Miles (Keanaʻaina)	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Takaki, Moses	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Takaki, Tracy	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Takizawa, Lorna (Medeiros)	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Tanimoto, Jojo	Cultural informant recognized by KD	Elison and McElroy (2011)	interviewee withdrew testimony
Tuiloma, Michelle	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Vaughan, Palani Jr.	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Ventura, Jeanah	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Wilson-Ku, Nalani	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Wolfgramm, Paulette Mome	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Wong, Kaupena	*Kamaʻāina* of Kakaʻako	Genz & Hammatt (2010)	No
Yamaguchi, Mae	Pohukaina School	Spearing et al. (2008)	No
Yokooji, Dayleen	Cultural informant recognized by KD	Elison and McElroy (2011)	No
Young, Tin Hu	Kawaiahaʻo Church	Genz & Hammatt (2010)	No
Zinsman, Karl Max Puou	Cultural informant recognized by KD	Elison and McElroy (2011)	No

KD=Kewalo Development
SHPD=State Historic Preservation Division
OHA=Office of Hawaiian Affairs
PK= Paulette Kaʻanohi Kaleikini

4.4.2 Cultural Practices & Resources Identified

The background and community consultations sections of Spearing et al. (2008), Vogeler et al. (2010), and Genz & Hammatt (2010) revealed a number of cultural practices that have occurred and/or are currently occurring in the Kakaʻako TOD project area. Table 15 provides a compilation of cultural practices identified in the previously conducted CIAs. As with other sections of these CIAs, a very comprehensive attempt at identifying past and present cultural practices and resources of Native Hawaiian groups was made. However, those of other ethnic groups and groups united by non-traditional Hawaiian cultural practices were scarcely covered. Further, the scope of each report was limited to the project area's boundaries. Therefore, cultural practices and resources, such as those listed in Table 8, occurring outside of the project areas of the previously conducted reports, but within and adjacent to the Kakaʻako TOD project area, still need to be identified and assessed.

Table 15. Cultural Practices & Resources Identified in Reviewed CIA

Practice/Resource	Practice/Resource Area	Time Period	Cultural Group	CIA Identifying Cultural Practice
Agriculture (*lo'i kalo, niu*, & non-traditional; animal husbandry)	Various locations within project area	Pre-Contact to Historic	Hawaiians (no longer practiced in area); Ward Family (no longer practiced); Kaka'ako residents (small scale subsistence & supplemental agriculture); Hālau Kū Māna (diverse array of native Hawaiian plants for education & traditional use)	Wilson Okamoto and Associates, Inc. (2002); Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010); Elison and McElroy (2011)
Aquaculture, fishponds (*loko i'a*)	Makai areas of Kaka'ako & Kewalo	Pre-Contact to Historic	Hawaiians (no longer practiced in area)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Archaeological Sites	Various locations within project area (in marked & unmarked locations)	Pre-Contact to Present	Hawaiians, other ethnic groups, & Community members (no specific ethnic group)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Cemeteries & burials (*iwi kūpuna*), traditional Hawaiian & post-Contact	Various locations within project area (in marked & unmarked locations)	Pre-Contact to Historic	Pre-Contact & early Contact Hawaiians (no longer practiced); Historic era no specific ethnic group	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Canoe landing & boat moorage	Kewalo Basin	Pre-Contact to Historic (canoe); Historic to present (boat)	Hawaiians (canoe landing no longer practiced in area); boat moorage practiced by various commercial, cultural, & ethnic groups	Genz & Hammatt (2010)
Ceremony & Religious Congregation	Various locations within project area	Pre-Contact to Present	Hawaiians (no longer practicing at *heiau;* human sacrifice abandoned; Catholic Church groups (Annual Holy Ghost Ceremony)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Feasting (*lū'au*) & traditional food preparation (*aku* drying)	Kewalo Basin area	Undeter-mined to Present	Hawaiians & other ethnic groups	Vogeler et al. (2010); Genz & Hammatt (2010)
Fishing (net & pole)	Kewalo Basin & Ala Moana areas (shoreline & from boats)	Pre-Contact to Present	Fishermen (no specific ethnic group)	Vogeler et al. (2010); Genz & Hammatt (2010)
Fishing, *aku sampan*	Kewalo Basin area	Historic to Present	Fishermen of the *Kula Kai*, last remaining *aku sampan* at Kewalo Basin	Genz & Hammatt (2010)
Fish processing & canning	Kewalo Basin area	Historic	Local, mostly Japanese, Korean, & Filipino	Genz & Hammatt (2010)

Practice/Resource	Practice/Resource Area	Time Period	Cultural Group	CIA Identifying Cultural Practice
Fisherman's Wharf	Bounded by Ala Moana Blvd., Ward Ave., & Kewalo Basin	Historic to Recent years	Community members (no specific ethnic group); tourist & local patrons	Spearing et al. (2008)
Habitation	Various locations within project area	Pre-Contact to Present	Hawaiians & other ethnic groups; modern era no specific ethnic group	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Historic Buildings	Various locations within project area	Historic to present	Community members (no specific ethnic group); commercial groups & individuals	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Memorial statue of Mother Marianne Cope	Kaka'ako Waterfront Park	Modern/ Present	Community members (no specific ethnic group)	Genz & Hammatt (2010)
Memorial statue of the *Pueo 'Aumākua*	Kaka'ako Waterfront Park	Modern/ Present	Community members (no specific ethnic group)	Genz & Hammatt (2010)
McKinley High School & Memorial statue of President William McKinley	Bound by King St., Pensacola St., Kapiolani St., & Neal S. Blaisdell Center	Historic to present	Community members (no specific ethnic group); current students & alumni	Vogeler et al. (2010)
Mother Waldron Neighborhood Park	Bounded by Halekauwila St., Coral St., Pohukaina St., & Cook St.	Historic to present	Community members (no specific ethnic group)	Spearing et al. (2008); Vogeler et al. (2010);
Plant & *limu* gathering for traditional purposes	Various locations within project area; McKinley High School campus	Pre-Contact to Present	Practitioners of *lā'au lapa'au;* gatherers of *pili* & *mahiki* grass (no longer practiced in area)*; limu* for traditional dishes	Spearing et al. (2008); Genz & Hammatt (2010)
Quarantine, human & animal	Kaka'ako Makai	Historic	Past smallpox, cholera, bubonic plague, & leprosy victims (no specific ethnic group); domesticated animals (pets & livestock)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Arms storage, & practice; coastal defense	Kaka'ako Makai	Historic	U.S. Army & Honolulu Rifle Association	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Salt (*pa'akai*) gathering & production (*kai ho'olulu*)	Much of Kaka'ako & Kewalo	Pre-Contact to Historic	Hawaiians, other ethnic groups, & commercial groups	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Surfing/Body Surfing & Swimming	*Makai* of Kewalo Basin and Kaka'ako Waterfront Park	Pre-Contact to Present	Surfers/Body Surfers, (no specific ethnic group)	Spearing et al. (2008); Genz & Hammatt (2010)

Practice/Resource	Practice/Resource Area	Time Period	Cultural Group	CIA Identifying Cultural Practice
Trails (*ala hele*)	Leading from Waikīkī to Honolulu (Kou) & connecting various communities to each other & resources	Pre-Contact to Present	Hawaiians, other ethnic groups, & Community members (no specific ethnic group)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Storied Places (*wahi pana*) & spiritual land associations	Various locations within project area	Pre-Contact to Present	Hawaiians, other ethnic groups, & Community members (no specific ethnic group)	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)
Ward Farmer's Market	Bound by Auahi St., Ward Ave., Queen St., & Kamakee St.	Historic to present	Community members (no specific ethnic group)	Spearing et al. (2008)
Waste Management, Historic era	*Makai* areas of Kakaʻako & Kewalo	Historic	Public & municipal	Spearing et al. (2008); Vogeler et al. (2010); Genz & Hammatt (2010)

5.0 NEWLY IDENTIFIED CULTURAL RESOURCES

Due to the fact that the Kakaʻako Transit Oriented Development (TOD) project area is spatially larger than the project areas of the previously conducted Cultural Impact Assessments (CIAs), there were several areas not covered by these assessments (Figure 17). Further, cultural resources were not identified for areas adjacent to the previous CIA project areas, which are to be included in these assessments according to the official CIA guidelines (OEQC 1997).

A number of cultural practices and resources that were either overlooked or outside of the scope of previous CIAs were identified in the course of this SCIA that occur in or adjacent to the Kakaʻako TOD Overlay project area. Further, cultural resources valued by non-Traditional and non-ethnic based cultural groups were considered in this assessment, as contemporary Kakaʻako is a community of multiple cultures and a hub for cultural activities for the entire island community.

Figure 17. Kakaʻako TOD and Reviewed CIA Project Areas.

Cultural resources have been grouped as: Historic Places and Landmarks, Cultural Learning Facilities, Public Parks and Grounds, Memorials and Commemorations, Religious and Spiritual Gathering Places, and Public Art Installation and Entertainment Centers. These locations function as cultural resources in a sense that community members frequent them tap into the institutional knowledge held by members of the same cultural group or sub-group who also frequent the location in addition to the resource (i.e. memorials, art, music, and food) that they identify with. Further, regular and intermittent gatherings by those united by a common tradition, practice, ideal, identity, belief, and/or memory generates an institutional knowledge within the group and serves to perpetuate their cultural practices and values. In some cases, cultural resources are not necessarily tangible in nature, but are locations that serve as repositories for various shared traditions, practices, ideals, identities, beliefs, and memories.

For the Kakaʻako TOD Overlay SCIA, numerous community consultations were performed, which focused on several different types of cultural groups representing the cultural landscape of the area that is now considered Kakaʻako. Cultural groups identified for the SCIA consisted of groups united by ethnicity, religion and spirituality, memorials, arts and entertainment, as well as sports and recreation. A total of 78 cultural groups and cultural informants were contacted for consultation, 29 of which agreed to participate. Participation consisted of 5 referrals to other informants, 7 email communications providing information on cultural resources, 2 informants granting permission to use prior interview data for Kakaʻako, 9 online questionnaire submittals, and and 6 interviews. However, one interview was not included as the cultural resource was to be discontinued and one online questionnaire was retracted.

In addition to documentation research and community consultations, five site inspections were performed on the 27th July as well as the 2nd, 10th, 15th, and 22nd of August 2013 by Kimberly M. Mooney of Pacific Legacy, Inc. to determine the extent of cultural usage of the property. These inspections consisted of largely of pedestrian survey and photographic documentation of portions of the project area. The area designated as Kakaʻako Makai and the HECO Downtown Power Plant portion of the Kakaʻako TOD Overlay project area were investigated on 27 July and 15 August 2013. Portions of the area designated as Kakaʻako Mauka was investigated on the 2nd, 10th, 15th, and 22nd of August 2013, sweeping streets generally from *mauka* to *makai* and ʻEwa to Diamond Head.

A total of 34 cultural resources consisting of Historic Places and Landmarks (n=8), Cultural Learning Facilities (n=7), Public Parks and Grounds (n=7), Memorials and Commemorations (n=4), Religious and Spiritual Gathering Places (n=4), and Public Art Installation and Entertainment Centers (n=4) were identified in this assessment (Figure 18; Table 16). A significant number of cultural resources (n=21) were identified as occurring within the project area and numerous resources occurring in areas adjacent to project area (n=13). Many of these cultural resources are unique locations where events and activities that are vital to various cultural groups are held. While some groups (e.g. contemporary and urban arts groups and the LGBT community) are often discounted by cultural studies due to their contemporary and/or "sub-culture" nature they exhibit all of the hallmarks or a distinct cultural group. Thus, it seems necessary to fully assess what cultural impacts may be caused by the proposed Kakaʻako TOD project, if it is enacted.

Newly Identified Cultural Resources:

1 Hawai'i Capitol Historic District
2 HECO Downtown Power Plant
3 Aloha Tower Complex
4 Falls of Clyde
5 Mabel Smyth Memorial Building
6 Post Office, Customhouse, & Courthouse Building
7 Dillingham Transportation Building
8 U.S. Immigration Office
9 African American Diversity Cultural Center of Hawai'i
10 Diverse Art Center
11 Hawai'i Children's Discovery Center
12 Maritime Museum
13 Nā Mea/Native Books Hawai'i
14 The Refuge (808 Urban)
15 Home of the Brave Tour
16 Kaka'ako Waterfront Park
17 Kewalo Basin Park
18 Kaka'ako Makai Gateway Park
19 Mother Waldron Neighborhood Park
20 Ala Moana Beach Park
21 Irwin Park
22 Thomas Square
23 Ehime Maru Memorial
24 MADD Memorial
25 Nagasaki Peace Bell
26 Florentino Das Plaque
27 First Chinese Church of Christ
28 Kawaiaha'o Church
29 Ke Alaula Oka Malamalama
30 Makiki Christian Church
31 POW! WOW!
32 Neal S. Blaisdell Complex
33 FreshCafe & Loft in Space
34 Vacant Lots & Thoroughfares

Figure 18. Map of Newly Identified Cultural Resouces (adapted from Google Earth map).

Table 16. Newly Identified Cultural Resources (map location numbers correspond with Figure 18).

Map Location	Resource	Resource Area	Period & Frequency	Comments
Historic Places & Landmarks				
1	Hawai‘i Capitol Historic District	57 acre area includes: 20 Historic Structures	1794 - present	Located partially within and adjacent to project area. Includes: Kawaiaha‘o Church, Hawaiian Mission Houses, Kapuāiwa Building, Hawai‘i State Library, Honolulu Hale, Honolulu Hale Annex (Mission Memorial Building Complex), and State (Territorial) Office Building. These structures are in or adjacent to the project area.
2	Hawaiian Electric Company (HECO) Downtown Plant	222 Ala Moana Boulevard	1929 - present	Architectural resource; in project area
3	Aloha Tower (State Site No. 80-14-9929), Aloha Tower Marketplace & Entertainment Complex	Pier 9, Honolulu Harbor	1926 - present	Architectural resource and Historic events relating to Hawaiian history ; adjacent to project area
4	The *Falls of Clyde*	Pier 7, Honolulu Harbor	Ship 1878-present, (in repair)	Maritime and Historical resource; adjacent to project area; No estimated date of reopening
5	Mabel Smyth Memorial Building	corner of Punchbowl St.& Ala Moana Blvd.	1941 - present	Architectural resource and Historic events relating to Hawaiian medical history; in project area
6	Post Office, Customhouse, and Courthouse Building (King David Kalākaua Building)	335 Merchant Street across Punchbowl Street from the project area’s western boundary	1922 - present	Architectural resource and Historic events relating to Hawaiian history ; adjacent to project area
7	Dillingham Transportation Building	*makai* end of Bishop Street, across from the HECO Downtown	1929 – present	Architectural resource and Historic events relating to Hawaiian history ; adjacent to project area
8	U.S. Immigration Office	595 Ala Moana Boulevard	mid-1930s - present	Architectural resource and Historic events relating to Hawaiian history ; adjacent to project area
Cultural Learning Facilities				
9	African American Diversity Cultural Center of Hawai‘i (AADCCH)	1311 Kapiolani Blvd Ste 203	Modern/ present	In project area
10	Diverse Art Center	1034 Queen Street	Modern/ present	In project area
11	Hawai‘i Children’s Discovery Center	111 Ohe Street	Modern/ present	In project area

Map Location	Resource	Resource Area	Period & Frequency	Comments
12	Maritime Museum	Pier 7, Honolulu Harbor	1988-2009	No estimated date of reopening; adjacent to project area
13	Nā Mea/Native Books Hawai‘i	1050 Ala Moana Blvd, Suite #1000	Modern/ present	In project area
14	The Refuge (808 Urban)	683 Auahi Street	Modern/ present	In project area
15	Home of the Brave Tour	Waimanu Street	Modern/ present	In project area
Public Parks and Grounds				
16	Kaka‘ako Waterfront Park (major venue for various cultural activities & events)	Bound by Pier 1 complex; John Burns School of Medicine Campus; Kelikoi St., & Kewalo Basin	Intermittent use	In project area; includes the surf breaks Point Panic, Flies, & Incinerators; fishing and diving, takes place along entire coastline (various fish species)
17	Kewalo Basin Park (significant venue for various cultural activities & events)	End of Kewalo Basin access road, between sea wall & harbor	Intermittent use	In project area; various marine activities associated with coastline of park, including fishing and surfing; harbor is moorage for dinner cruzes, parasailing, commercial fishing, glass bottom boats, and jetski rentals
18	Kaka‘ako Makai Gateway Park (significant venue for various cultural activities & events)	Bound by Cooke St., Ala Moana Boulevard, & Ohe St	Intermittent use	In project area; various activities,from organized events to random usage
19	Mother Waldron Neighborhood Park (significant venue for various cultural activities & events)	525 Coral St.	1937-present; Intermittent use	Site#80-14-1388; a “C & C of Honolulu Art Deco Park"; Within project area; from numerous regularly occurring activities, to major annual events, to random usage of park
20	Ala Moana Beach Park (major venue for various cultural activities & events)	Bound by Kewalo Basin, Ala Moana Boulevard, Ala Wai Harbor, & ocean.	Historic-present; Intermittent use	Adjacent to project area; from numerous regularly occurring activities, to major annual events, to random usage of park
21	Irwin Park (minor venue for various cultural activities & events)	Bound by Aloha Tower Dr., Bishop St., Ala Moana Boulevard, & Fort St.	1930-present; Intermittent use	Adjacent to project area; random usage of park, possible small scale regular usage
22	Thomas Square (minor venue for various cultural activities & events)	925 S Beretania St.	Intermittent use	Adjacent to project area; from numerous regularly occurring activities, to major annual events, to random usage of park
Memorials and Commemorations				
23	Ehime Maru Memorial	Kaka‘ako Waterfront Park	2002-present	Tragic sinking of a Japanese educational fishing vessel in 2001; in project area

Map Location	Resource	Resource Area	Period & Frequency	Comments
24	MADD Memorial	Kakaʻako Waterfront Park	Modern / present	Multiple services, random visits; in project area
25	Nagasaki Peace Bell (MLK Day & Anniversary of bombing Aug. 9th)	F. F. Fasi Civic Grounds (South Beretania parking entrance)	1990-present, Annual, 2 ceremonies	Adjacent to project area
26	Florentino Das Commemorative Plaque	Kewalo Basin Park	2011-present	1955 solo 1 yr voyage from Kewalo to Philippines; in project area
Religious and Spiritual Gathering Places				
27	First Chinese Church of Christ	1054 South King Street	1929 – present	Regular Sunday service, additional religious and cultural activities held on grounds; Historic structure, likely eligible for NRHP; adjacent to project area
28	Kawaiahaʻo Church	Corner of Punchbowl * King Streets	1840s - present	Regular Sunday service, additional religious and cultural activities held on grounds; Historic structure with NRHP status; in project area
29	Ke Alaula Oka Malamalama (The Bright Morning Rays of the Church of Reasonable Service)	910 Cooke Street	1880s – present	Regular Sunday service in Hawaiian language; hymns in Hawaiian; Historic religious organization
30	Makiki Christian Church (Site No. 80-14-9719)	829 Pensacola Street	1904 – present	Regular Sunday service; service in Japanese language; Historic structure, Historic structure with NRHP status; adjacent to project area
Public Art Installation & Entertainment Centers				
31	POW! WOW!	Between Queen Street and Ala Moana Boulevard	2010 - present	Various locations of murals featuring local and international artists; week long annual festival
32	Neal S. Blaisdell Concert & Exhibition Complex	Bound by S. King Street, Ward Avenue, & Kapiolani Boulevard	1964-present, used intermittently	Three major venues; multiple points of interest; in project area
33	FreshCafe & Loft in Space	831 Queen Street	2009-present, intermittent & regular events	Hosts regular community events; cultural resource for arts community; in project area
34	Vacant Lots & Thoroughfares	Various locations in Kakaʻako	Modern / present	Events include: Art & Flea; Eat the Street; Honolulu Night Market; Honolulu 5K and 1 Mile Keiki Run/Walk; King Kamehameha Floral Parade; Pow!Wow! Hawaiʻi; Three Walls Music Festival

5.1 Historic Places & Landmarks

The Kakaʻako TOD Overlay project area has numerous significant Historical properties. The project is adjacent to Honolulu proper as well as Waikīkī, which have been the backdrop of political and social events that shaped Hawaiʻiʻs complex history. A total of 31 Historic structures in the project area are already registered on the National Register of Historic Places (NRHP) and Hawaiʻi State Register of Historic Places (Figure 19).

A number of Historic places and landmarks still in existence in Kakaʻako have been identified in previous CIA (Wilson Okamoto and Associates, Inc. 2002; Spearing et al. 2008; Vogeler et al. 2010; Genz & Hammatt 2010; Elison and McElroy 2011), including the Kawaiahaʻo Church and Grounds, Mission Houses, Old Kakaʻako Fire Station, Kakaʻako Pumping Station, Mother Waldron Neighborhood Park, McKinley High School, Makiki Christian Church, Yee/Kobayashi Store, and the Royal Brewery Building. However, the HECO Downtown Plant and Mabel Smyth Memorial Building, which are situated within in the project boundaries have not been identified in previous CIA. Furthermore, the Aloha Tower, *Falls of Clyde*, Kapuāiwa Building, Hawaiʻi State Library, Honolulu Hale and Annex, State (Territorial) Office, U.S. Post Office, Customhouse, and Courthouse Building, Dillingham Transportation Building, and U.S. Immigration Office, which are located adjacent to the project had not been previously identified as cultural resources either. While the Kawaiahaʻo Church and Grounds, Mission Houses, and Mother Waldron Neighborhood Park park have been included in previous CIA as Historic Places, this Supplemental CIA identifies them as also being culturally significant in a contemporary sense, where these properties provide a unique space for contemporary cultural practices to occur.

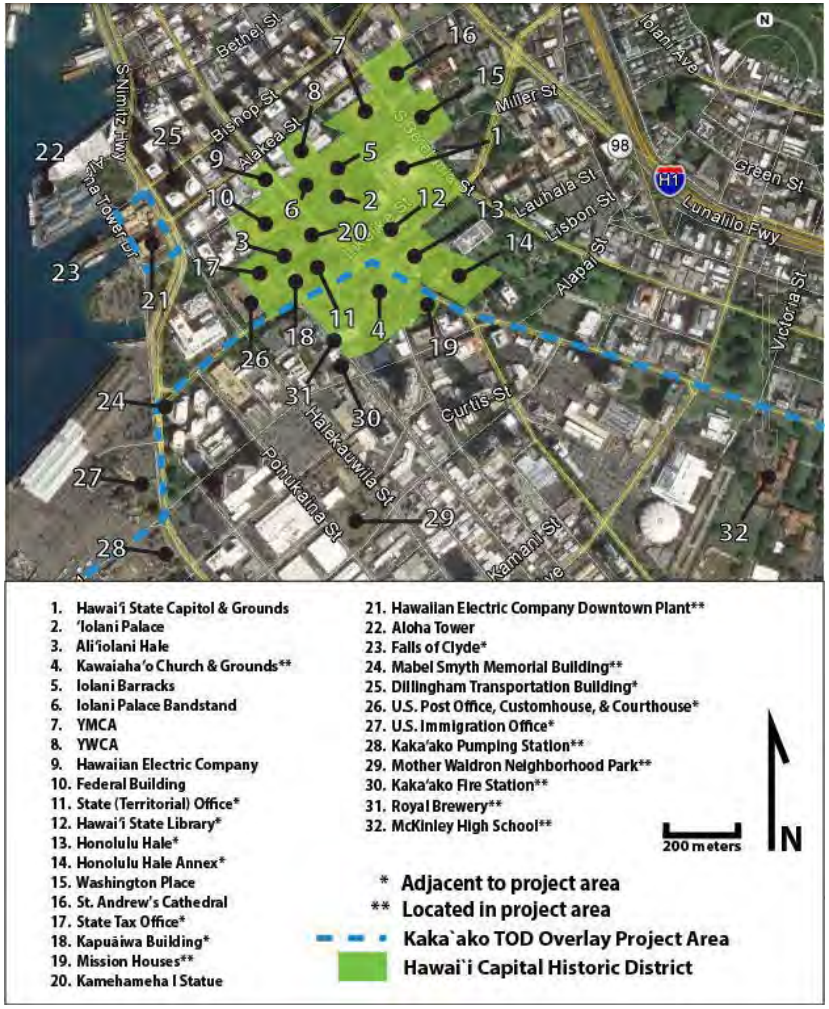


Figure 19. Historic Places & Landmarks located in and adjacent to project area (adapted from Google Earth).

5.1.1 Hawai'i Capitol Historic District

The Hawai'i Capitol Historic District is special district in Honolulu that includes 20 individual Historic Properties (NRHP Reference No. 78001020; State Site No. 80-14-1321). The great majority of the district lies west of the Kaka'ako TOD Overlay project area, but overlaps the project area's northwest corner (Figure 19). The NRHP Nomination Form for the Hawaii Capitol Historic District, which describes the district and most buildings included within, is provided in Appendix E. The Hawai'i Capital Historic District is described in the in the NRHP Nomination Form to have the following characteristics that make it eligible for preservation:

> 1) Open space to building mass relationship: the district encompasses a 57 acre area of which 84% is open space; a building mass to open space ration of 1 to 6.25.
> 2) Visual Access: The district because of its high ratio of open space to building mass, offers a 360°, 57 acre visual plane within a dense urban setting of high and medium high rise structures.
> 3) Architectural Character: The Capital Historic District offers the most cohesive and concentrated historic building categories in the state of Hawaii. These categories include:
> a. Classical Revival
> b. Romansque
> c. Spanish Mission
> d. Italian Mediterranean
> e. French Romanesque
> f. New England Frame (Colonial Rustic)
> g. French Baroque
> h. Georgian (Early Republic USA)
> (NRHP 1978a:2)

Two Historic properties belonging to the Hawai'i Capital Historic District are located in the project area, including the Kawaiaha'o Church and Hawaiian Mission Houses. Both properties have Historic and contemporary cultural significance. A total of 5 Hawaii Capital Historic District properties are adjacent to the project area, including the Kapuāiwa Building, Hawai'i State Library, Honolulu Hale, Honolulu Hale Annex, and State (Territorial) Office.

Kawaiaha'o Church & Grounds

Kawaiaha'o Church is one of the most iconic Historic properties in Kaka'ako as well as a well venerated Christian institution for the island of O'ahu. The church is located in the northwest corner of the project area and is a component of the Hawai'i Capitol Historic District. This "stone" church was constructed mostly of great coral slabs in the early 1840s and has been restored a number of times due to termite damage. A copy of the NRHP Nomination Form for Kawaiaha'o Church, which includes the Mission Houses, is provided in Appendix E for a thorough description and background of the Historic church complex.

Since its erection, Kawaiaha'o Church has been the center of cultural activities for the entire island community. According to the NRHP Nomination Form:

> The historical significance of Kawaiahao Church is indicated by the fact that it is often called "the Westminister Abbey [sic] of Hawaii," Outgrowth of the original Mission Church founded in Boston in 1819 and of the first foreign church on Oahu, it symbolizes the work of the Protestant missionaries, "one of the motivating faces in the life of Honolulu and the Islands." As the state church, it was the scene of many celebrated events--inaugurations, funerals, weddings, thanksgiving ceremonies associated with the Hawaiian kingdom (NRHP 1978b:8).

To this day Kawaiahaʻo Church is the choice setting of important events and ceremonies. The Church and its grounds have been recognized in previous CIA as culturally significant in the past. However, it is important to note that Kawaiahaʻo Church remains to be a major cultural hub for Christians as a cultural group and for the general community of Kakaʻako. The church hosts regular and special events that are open to the community, such as craft fairs, physical fitness classes, youth programs, and Christian based education programs. Site inspections of Kawaiahaʻo Church on the 2nd and 22nd of August verified the contemporary cultural usage of the church and its grounds.

Hawaiian Mission Houses Historic Site and Archives (HMH)

The Mission Houses, located at 553 South King Street, are on the State Register of Historic Places (No.80-14-9991; DUPE State Site No. 80-14-1321) and designated a National Historic Landmark along with Kawaiahaʻo Church since 1965 (Reference No. 66000294) (Appendix E). This Historic complex is also currently a unique cultural learning facility. HMH's Mission Statement is as follows:

> Hawaiian Mission Houses Historic Site and Archives preserves the heritage and interprets the stories of the American Protestant Missionaries, their descendants, and their relationships with the people and cultures of Hawaiʻi, connecting with contemporary life, and encouraging a deeper understanding and appreciation for the complex history that continues to shape Hawaiʻi (HMH website 2013).

Aside from providing access to a large archive of Historic documents and artifacts related to Hawaiʻi's first missions, the HMH hosts free events and offers educational opportunities for the general public to understand the role that missionaries played in Hawaiʻi's History. Public programs consist of "…tours, lectures, family days, workshops, backpacks, teas, exhibitions, and special events" (HMH 2013: Public Programs). Further, HMH offers school programs and events such as a holiday craft fair and public access to an unobstructed view of the Honolulu City Lights Parade, which has been a Honolulu Christmas tradition since 1985. Site inspections of HMH on the 2nd and 22nd of August verified the contemporary cultural usage of the HMH buildings and grounds.

Kapuāiwa Building

The Kapuāiwa Building was constructed in 1884 by George Lucas. The building's location is directly across Punchbowl Street from the project area's western boundary. This two-story, concrete block structure uses an "English inspired ideal of Italian Renaissance" revival style of architecture. The building was originally constructed as a fireproof structure for storing official

government documents, but eventually became a government office building. Although it is a component structure of the Hawaiʻi Capitol Historic District, the Kapuāiwa Building has its own NRHP Nomination Form (NRHP 1973), which is provided in Appendix E. Site inspections of the Kapuāiwa Building on the 2nd and 22nd of August verified the absence of contemporary cultural usage of the building or its grounds.

Hawaiʻi State Library

The Hawaii State Library at 478 South King Street was constructed between 1911 and 1913. The building was designed for the Territory of Hawaii by Henry D. Whitfield in association with Honolulu architect H. L. Kerr and was partially funded by Andrew Carnegie. The library was also supported by Hawaiʻi's royal family and traces its roots to the Honolulu Library and Reading Room Association, which were founded in 1879. This Historic structure is situated on Punchbowl Street directly across from Honolulu Hale and adjacent to the project area's northwest corner. The NRHP Nomination Form (Appendix E) states that the building is significant for the following characteristics:

> 1. The location and scale of the structure is a supplemental element to the total sense/character of the Capitol District. The Hawaii State Library occupies a pivotal position within the architectural landscape of the Capitol District; in conjunction with the Iolani Palace, this building stands at the center of the Capitol District and creates an architectural scale counterpoint to the buildings surrounding the Iolani Palace grounds.
>
> 2. Of particular architectural note is the use of bronze grille work insets in the arches of the main entry, this is the only example of this particular architectural treatment in the State of Hawaii. Also of note is the architect's strict adherance [sic] to classical design principles (except for the inclusion of the Roman derivative arched portico element with bronze grille work) (NRHP 1978a:17).

The building is actively used by the Hawaiʻi State Public Library System as the main library and primary resource center that currently holds more than a half million cataloged books and more than a million items considered supporting materials (HSPLS 2013). The Hawaii State Library hosts numerous exhibits and events a year as well as public installations of art from various genres. The Hawaii State Library is an important contemporary cultural resource utilized by people from all over the island as well as Kakaʻako. Site inspections of Hawaiʻi State Library on the 2nd and 22nd of August 2013 verified the contemporary cultural usage of the library and its grounds.

Honolulu Hale

Honolulu Hale is a late-1920s four-story, reinforced concrete and structural steel, Spanish Colonial/Italian style building with a single six story tower that was designed by architects C. W. Dickey, Hart Wood, Robert G. Miller, Guy Rothwell, and Marcus C. Lester. The building was opened for city use November 26, 1929. Honolulu Hale is located on the corner of King and Punchbowl Streets, directly across King Street from Kawaiahaʻo Church and the project area. A full description is available in the Hawaiʻi Capital Historic District NRHP Nomination Form in Appendix E.

Honolulu Hale was built for the city government, which outgrew the building long ago. The building is now used as the City Hall of Honolulu as well as the Mayor's and City Council's offices. Currently the Mayor's Office of Culture & the Arts (MOCA) currently hosts cultural exhibits that are free and open to the public at the Honolulu Hale Courtyard (MOCA 2013). Although no cultural practices were observed during a site inspection of Honolulu Hale on 22 August 2013, the presence of contemporary cultural usage of the HMH buildings and grounds was found through documentary research.

Honolulu Hale Annex (Mission Memorial Building Complex)

The Honolulu Hale Annex was originally the Mission Memorial Building Complex, which is a two-story high Georgian Revival or Neo-Classical style building on King Street between Honolulu Hale and adjacent to the north border of the project area. In 1915-1916 the Hawaii Evangelical Association commissioned the building of the Mission Memorial Building to commemorate the centennial anniversary of the first missionaries arrival to Hawai'i. The annex, designed by architect Mark Potter, was completed January 12, 1930 and dedicated April 11, 1930. Detail of the structures are provided in the Hawai'i Capital Historic District NRHP Nomination Form in Appendix E. This complex has been home to the Hawaii Evangelical Association headquarters, Kawaiaha'o Seminary, Hawaiian Mission Children's Society, Honolulu Mission Printing Office, and various C & C of Honolulu agencies. The auditorium portion has been restored from office space to a venue where various cultural events are sanctioned (MOCA 2013). According to MOCA (2013), meetings by various City Departments take place during the day and during the evenings and weekends, cultural performances are presented by community organizations at the Mission Memorial Auditorium (MOCA 2013). Although no cultural practices were observed during a site inspection of Honolulu Hale on 22 August 2013, the presence of contemporary cultural usage of the HMH buildings and grounds found through documentary research was not challenged.

State (Territorial) Office Building

The six-story high, reinforced concrete and structural steel Territorial State Office Building was designed for the U.S. Federal Government by architect Arthur Reynolds in 1926 for the Hawai'i Territorial Administrative offices. The Territorial State Office Building is located at the corner of King and Punchbowl Streets directly across from the Hawaii State Library. This Historic property is adjacent to the project area's west boundary. According to the NRHP Nomination Form, the Territorial State Office Building is significant due to its "…location within the Capitol District area; the building and its grounds blend, and add to the total texture, scale, and historic character of the Capitol District" (NRHP 1978a:15). Documentary research found no cultural practices were found to be associated with the structure. A site inspection performed on 10 August 2013 by Kimberly M. Mooney of Pacific Legacy, Inc. failed to identify any current cultural usage of the building or grounds.

5.1.2 Hawaiian Electric Company (HECO) Downtown Plant

The HECO Downtown Plant, located at 222 Ala Moana Boulevard, is not yet recognized by the State of Hawai'i as a Historic site. The power plant, built in 1929, is situated on a 3.4 acre property, which is bound by Nimitz Highway, Bishop Street, Richard Street, and Aloha Tower Drive, is located within the project area. The building is likely eligible as a Historic property, yet it has not been included in any previous CIA as a cultural resource. No cultural practices

have been identified as occurring in or around this property through documentary research and the site survey performed 10 August 2013 by Kimberly M. Mooney of Pacific Legacy, Inc. failed to identify any current cultural usage of the building or grounds.

5.1.3 Aloha Tower

Built in 1926, the Aloha Tower is a iconic 184- foot tall tower is situated Pier 9 of Honolulu Harbor is bound to the north, south, and west by Honolulu Harbor and bound to the east by Irwin Park (Figure 20). This Historic building is located about a tenth of a mile (ca. 150 meters) northwest of to the HECO Downtown Plant portion of the Kaka'ako TOD Overlay project area. Aloha Tower was added to the State Register of Historic Places in 1981 and NRHP in 1976 (State Site No. 80-14-9929 and NRHP Reference No. 76000660), meeting NRHP criteria A and C. A copy of the NRHP Inventory Nomination Form is provided in Appendix E, which describes the history, architecture, and its cultural significance. Smith and Rosendahl (1990) prepared a historical assessment of the Aloha Tower that provides added archival documentary research for the historic property. While the site is recognized as a cultural resource, no CIA to date has included the Aloha Tower as a cultural resource.

Figure 20. Aloha Tower and Aloha Tower Market Place (view to north).

A site inspection was performed on 10 August 2013 by Kimberly M. Mooney of Pacific Legacy, Inc. to determine the extent of cultural usage of the property. The surrounding property was found to continue to function as a commercial marketplace despite the fact that the marketplace is slated to become a residence hall for Hawai'i Pacific University. As a result, many of the commercial spaces appeared to be unoccupied and the grounds fairly void of activity. Therefore, a survey of cultural practices currently occurring in or around the Aloha Tower was inconclusive.

5.1.4 The *Falls of Clyde*

The *Falls of Clyde* is a four-masted, iron hulled ship built in 1878 that is currently moored at Pier 7 in Honolulu Harbor, which is directly across the street from the HECO Downtown Plant portion of the Kaka'ako TOD Overlay project area (Figure 21). This Historic Maritime Landmark was added to the NRHP list in 1973 (Reference No. 73000659) and is also on the SRHP list (Site No. 80-14-9700). Appendix F provides the National Historic Landmark Study for the *Falls of Clyde* (Delgado 1988). According to Delgado (1988:1), the *Falls of Clyde* was "…rescued from destruction, moved to Honolulu and first restored and opened to the public in 1968. Since then, the vessel has undergone continual restoration… and then restored in 1970 to her original ship rig." The *Falls of Clyde,* formerly under the management of the Bishop Museum, is now managed by The Friends of Falls of Clyde (FoFOC), which is a non-profit 501(c)3 organization whose mission is to preserve and restore the ship. FoFOC is currently in the preparation phase for restoring the *Falls of Clyde* and provides monthly updates on their website (FoFOC 2013). A site inspection performed on 10 August 2013 by Kimberly M. Mooney of Pacific Legacy, Inc. failed to identify any current cultural usage of the ship.

Figure 21. The *Falls of Clyde* in repair (view to south).

5.1.5 Mabel Smyth Memorial Building

The Mabel Smyth Memorial Building is located at the corner of Punchbowl Street and Ala Moana Boulevard, which is on the northwest border of the Kaka'ako TOD Overlay project area (Figure 19). This building, constructed in 1941, is listed in the State and National Register of Historic Places (Reference No. 93001558; State Site No. 80-14-9765) due to its Modern Movement/Art Deco/Hawaiian Style architecture and its association with the evolution of modern health care in Hawai'i. According to the NRHP Nomination Form,

> The Mabel Smyth Memorial Building is significant as an example of the work of architect C.W. Dickey and for its associations with the medical profession in Hawaii. In 1937, in reaction to the sudden and early death of Mabel Leilani Smyth, who had for eight years been Superintendent of the Public Nursing Service, there was a Territorial-wide drive to commemorate her accomplishments. A unique center was envisioned, one that would be headquarters for the entire medical profession, in which nurses' and doctors' associations could convene their meetings; a research library could be housed; and where people could gather for educational programs and social interactions (NRHP 1993:8).

Currently the building is home to the Queens Conference Center, which is a venue for medical education, conferences, and meetings within the health care professional community. The complete NRHP Nomination Form is available in Appendix E. Documentary research found no cultural practices were found to be associated with the structure. A site inspection performed on 10 August 2013 by Kimberly M. Mooney of Pacific Legacy, Inc. failed to identify any current cultural usage of the building or grounds.

5.1.6 U.S. Post Office, Customhouse, and Courthouse Building

The U.S. Post Office, Customhouse, and Courthouse Building, also referred to as the King David Kalākaua Building, is located at 335 Merchant Street, which is directly across Punchbowl Street from the project area's western boundary. The structure is three-stories high with two six-story towers built in the Spanish Colonial Revival style in 1922, but expanded in 1929. The Historic structure is registered in the State and National Register of Historic Places (Reference No. 75000620; State Site No. 80-14-9952; DUPE State Site No. 80-14-1321) for its historical significance and architectural style (NRHP 1974). The NRHP Nomination Form is provided in Appendix E for further details. The building was once the official seat of administration in the Territory of Hawaii and state of Hawaii for the United States federal government, but now is solely owned and operated by the State. Documentary research found no cultural practices were found to be associated with the structure. A site inspection performed on 10 August 2013 by Kimberly M. Mooney of Pacific Legacy, Inc. failed to identify any current cultural usage of the building or grounds.

5.1.7 Dillingham Transportation Building

The Dillingham Transportation Building, built in 1929, is a four-story Italian Renaissance/ Mediterranean revival concrete and concrete block structure with three connected wings. It is located at the *makai* end of Bishop Street, across Ala Moana Boulevard of the HECO Downtown Power Plant portion of the project area. The Historic structure is listed on the State and

National Register of Historic Places (Reference No. 79000756; State Site No. 80-14-9900) for its associations with Benjamin Franklin Dillingham, the founder of Dillingham Corporation – a major player in Hawaiian History (NRHP 1973a). The NRHP Nomination Form is provided in Appendix E for a full description. Documentary research found no cultural practices were found to be associated with the structure. A site inspection performed on 10 August 2013 by Kimberly M. Mooney of Pacific Legacy, Inc. failed to identify any current cultural usage of the building or grounds.

5.1.8 U.S. Immigration Office
The U. S. Immigration Office is a complex consisting of five buildings, including the administration building, detention building, lounging shed, garage, and waiting shed. The complex is located on 595 Ala Moana Boulevard, which is adjacent to the southwest boundary of the project area. This complex, constructed in the mid-1930s, is registered in the State and National Register of Historic Places (Reference No. 73000664; State Site No. 80-14-9964) due to its qualities as being a fine example of Hawaiian architect, C. W. Dickey's, work and his ability to adapt architecture to the climate and atmosphere of Hawai'i (NRHP 1973b). The complete NRHP Nomination Form is available in Appendix E. Documentary research found no cultural practices were found to be associated with the structure. A site inspection performed on 10 August 2013 by Kimberly M. Mooney of Pacific Legacy, Inc. failed to identify any current cultural usage of the building or grounds.

5.2 Cultural Learning Facilities

A total of seven cultural learning facilities were identified in the Kaka'ako TOD Overlay project area. These cultural resources provide the entire community of O'ahu as well as the community of Kaka'ako with unique access to cultural knowledge and archives, access to raw and constructed cultural materials, space to create cultural materials, space to enact and perpetuate cultural practices, and space to collaborate with fellow practitioners.

5.2.1 African American Diversity Cultural Center of Hawai'i (AADCCH)
The African American Diversity Cultural Center of Hawai'i (AADCCH) is located in Kaka'ako, and serves as the only repository of documentation and artifacts relating to African American history in Hawai'i. The center has been in existence for 15 years. AADCCH hopes to secure a permanent location in Kaka'ako with increased public access and space for exhibits.

Community Consultation: Ms. Deloris Guttman - AADCCH
Deloris Guttman, Historian and President of AADCCH as well as author of the book, titled *Images of African Americans in Hawai'i*. Guttman was interviewed by Kimberly M. Mooney of Pacific Legacy, Inc. at AADCCH offices on 22 August 2013. She has lived and worked in Hawai'i since 1973.

According to Ms. Guttman, people of African ancestry have played a longer and more pivotal role in Hawaiian history than generally believed. She has been researching and compiling historical documents and artifacts with the assistance of other researchers for decades. Countless tantalizing scholarly dissertation and theses on the subject of African Americans in

Hawaiian Island history can be written based upon tangential story lines that Guttman has come across while performing archival research. She maintains that these untold stories are just waiting to be shared and much of the data is available in AADCCH collections.

The general public has little knowledge of African Americans and people of African descent in Hawaiian history. African Americans played crucial roles in adapting the Hawaiian kingdom to Western style infrastructure, domestic and international diplomacy, education, as well as the arts. Unbeknownst to many, people of African descent first ventured to Hawai'i in the late 1700s as merchant seamen. The most influential of these was Anthony D. Allen of Schenectady, New York. Allen visited many ports around the world before making Honolulu his home in the early 1800s, which was his second voyage to the islands. Shortly after his arrival, Allen became an advisor to King Kamehameha I. He was also a successful entrepreneur and businessman, who built the first hotel, restaurant, bar, and bowling alley in Waikīkī as well as its first hospital on lands located on the site of Washington Middle School, which was given to him by the High Priestess Hewahewa. Among Allen's multi-entrepreurial business ventures included animal husbandry and agriculture. According to Guttman, he supplied his customers with dairy products, meats, and produce. King Kamehameha I himself was among his many patrons. Allen was also involved with the (early infrastructure) building of a permanent roadway in Manoa, now known as Punahou Street.

Allen eventually married a Hawaiian woman and had three children. This was the case with many other men who settled in Hawai'i from abroad. His progeny married and procreated in the islands – some of whom are just finding out about his or her African American ancestry and interested in finding out more about Allen. In AADCCH's collection, the public can find more information about Allen as well as many other persons of African descent who played key roles in Hawaiian history.

MS. Guttman believes Kaka'ako is the cultural "Mecca" of the island of O'ahu, which is why she feels that it is the best location for the AADCCH. Her goal is to open up a cultural learning center that researchers can access and add to the African Americans Hawaiian history data collection as well as provide a space for the general public to view exhibits on the subject. In her opinion, this facility would benefit from the proposed project in terms of increased exposure that the Kaka'ako TOD's added residential and commercial space would bring.

5.2.2 Diverse ART Center
Diverse ART Center is a non-profit youth empowerment resource in Kaka'ako that facilitates classes, workshops and events in music, art, dance and education. The Diverse ART program is designed to develop and build self esteem, self confidence and self awareness in O'ahu's inner-city youth, giving them the opportunity to become respectful contributors to their community, families, and schools. The program allows people to be creative in a positive, supportive and productive environment that brings together a large network of artists from various arts genres. Artists participating in the program work together in teaching classes, holding workshops, producing live events and theater productions, and assist in film making.

Community Consultation: Ms. Nicole Kealoha - Diverse ART Center
Executive Director and founder of Diverse ART Center, Nicole Kealoha, contributed

information regarding the center and program via emails and an online questionnaire between July and August of 2013.

According to Ms. Kealoha, the program has the ability to lower instances of vandalism, violence, and drug abuse as well as increase the number of high school graduates, youths' respect for community and its members, and contributions to the local community (Kealoha 2013). The Diverse ART Center's mission as stated on its website is as follows:

> Diverse Art Center exists to provide creative outlets and opportunities for youth through arts, wellness, and sustainability programming; connecting them with professional performers/teachers who will inspire and nurture the development of self expression with an emphasis on character. Sending them back into their communities as productive contributors (Diverse ART 2013).

The Diverse ART Center is located within the project area at 604 Ala Moana Boulevard and is open to the public Monday through Saturday 4pm-9pm. Ms. Kealoha adds that Diverse ART services "…between 60-70 people a week from all races, demographic[s] and ranging from ages 3-40 yrs" (Kealoha 2013). Classes for various dance styles, such as House, Breaking, Choreo/Street, and Tahitian are regularly held as well as Urban visual arts and music classes. Thus, the Diverse ART Center is another significant resource for the Urban arts community.

Regarding the proposed Kakaʻako TOD Overlay, Ms. Kealoha feels that it is "…another Salt Lake in the making…" where the area is "…being approved piecemeal (project by project)…" (Kealoha 2013). For instance, Ms. Kealoha maintains that the Diverse ART Center had a secure location that is no longer available. She also wonders if Park Dedication fees have been forgotten, as the community of Kakaʻako needs open space for "quality of life" (Kealoha 2013). Further, she states that, "Under the guise of work force housing developers are reaping huge profits. There is no restriction to curb speculator[s]…" (Kealoha 2013).

5.2.3 Hawaiʻi Children's Discovery Center

Located at 111 Ohe Street in Kakaʻako Makai, The Hawaiʻi Children's Discovery Center is a unique cultural learning facility for the community of Kakaʻako and island of Oʻahu. This facility offers an interactive but safe environment for children to learn about themselves, the natural world, and the many cultures of Hawaiʻi. This facility is open to the public with a general admission fee, but offers educational programs that works with public and private school children participate in "focused school visits" as well as discounts and membership rates (Hawaii Children's Discovery Center 2013).

5.2.4 Hawaiʻi Maritime Center

The Hawaii Maritime Center, located at Pier 7 in Honolulu Harbor, was a public maritime themed museum under the management of Bishop Museum, in operation from 1988 to 2009 (Figure 22). According to a Bishop Museum representative, the museum is "currently non-operational and Bishop Museum has no plans to bring the building into operations within the reasonably foreseeable future" (Dettweiler 2013). This museum once celebrated Hawaiʻi's rich maritime history through exhibits, displays, and rare maritime artifacts. Currently, no cultural practices are identified as occurring in or around the Hawaiʻi Maritime Center.

Figure 22. Hawaiʻi Maritime Center, currently closed (view to south).

5.2.5 Nā Mea/Native Books Hawaiʻi

Nā Mea/Native Books Hawaiʻi doubles as a Hawaiiana and Pacific retail outlet as well as a cultural learning facility (Figures 23 and 24).

Community Consultation: Mr. Mathias Maas - Nā Mea/Native Books Hawaiʻi

On 27 August 2013, Mathias Maas, Store Manager for Nā Mea/Native Books Hawaiʻi, was interviewed by Kimberly M. Mooney of Pacific Legacy, Inc. on the cultural learning center/store grounds.

Nā Mea/Native Books Hawaiʻi, which has been around for nearly 25 years, is much more than a Hawaiiana and Pacific retail outlet, according to Mr. Maas, it is a vital cultural resource where people can learn about and participate in an array of Traditional Hawaiian cultural practices. The store is one of the few locations that carries almost exclusively *nā mea Hawaiʻi*, or things having to do with Hawaiʻi, such as a wide variety of Traditional and contemporary arts and crafts made locally with predominantly local materials, which greatly supports practitioners of Native Hawaiian arts and crafts financially. Mr. Maas explained that because Nā Mea/Native Books Hawaiʻi specializes in selling these authentic Hawaiian products, the store attracts the type of customer who is willing to pay extra for their merchandize, which allows the practitioner to make a better profit. Ultimately, this affords the practitioner a livable income from his or her product, which helps to preserve and perpetuate these cultural practices by allowing the practitioner to perfect his or her skills, create more traditional products with more authentic local materials, and perhaps have the time to teach others.

Figure 23. One of Nā Mea/Native Books Hawai'i's retail displays (view to east).

Figure 24. A craft production station at Nā Mea/Native Books Hawai'i (view to south).

While Nā Mea/Native Books Hawai'i is primarily a retailer of Hawaiian and Pacific products, it has a doubles as a Hawaiian cultural learning center that serves the general public. Maas holds that people from all over O'ahu, neighbor islands, as well as a great number of tourists visit the cultural learning center/store to purchase hard-to-find Hawaiian products and books as well as

participate in the many classes and activities. According to Mr. Mass, the average age of the Nā Mea/Native Books Hawai'i customer or learner is well into the 30s-40s; yet, the center offers Hawaiian products, classes, and activities for all ages.

An array of Hawaiian centered classes and activities are regularly held at Nā Mea/Native Books Hawai'i. While classes are free, materials are not provided. Visitors can also learn from and or simply enjoy local musicians as they play Hawaiian music or *kūpuna* share *mo'olelo* (storytelling), which play for free regularly– though tips are accepted. Every day the cultural learning center offers at least one activity or class in Traditional cultural practices including a variety of arts and crafts using a range of Traditional methods and materials as well as *lomi lomi* (massage) healing, *hula* (dance), *'ōlelo Hawai'i* (Hawaiian language), and *'ukulele* – to name a few. The cultural learning center arm also works in conjunction with other local cultural organizations to provide specialized workshops for the public. Mr. Maas provided an example, where recently Nā Mea/Native Books Hawai'i held a workshop with Kumu Kahua Theatre to help local writers learn about playwriting. Another example is the multifaceted annual Pow!Wow! Kaka'ako arts event, in which Nā Mea/Native Books Hawai'i helped to organize for the last few years. The center also hosts conferences for professionals in various Hawaiiana based fields, such as writing and publishing.

Additionally, Mr. Maas stated that Nā Mea/Native Books Hawai'i has the most comprehensive selection of new and used Hawaiiana books, including rare or out-of-print manuscripts and those written by local authors that are not available in major book stores. The selection of books at Nā Mea/Native Books Hawai'i focuses entirely on *nā mea* Hawai'i and the Pacific, ranging from Hawaiian history reference books to contemporary books for *keiki* as well a wide variety of CDs and DVDS. The book selling arm of the store, though commercial in nature, also functions to preserve and perpetuate Native Hawaiian traditions. For those who may not have direct access to *kahu* of a specialized practice or *kūpuna* for oral traditions, books can be an invaluable cultural resource. In some cases, Nā Mea/Native Books Hawai'i provides access to out-of-print reference books to Native Hawaiians researching their genealogy.

In regards to the proposed development, Mass maintains that Nā Mea/Native Books Hawai'i is supportive of the proposed Kaka'ako TOD Overlay project. Mr. Maas believes that the proposed development will revitalize Kaka'ako and provide a sound architectural landscape that will bring in families and likely increase patronage at Nā Mea/Native Books Hawai'i. Further, he holds that it's better to keep major development within the footprint of previously disturbed lands, such as Kaka'ako, rather than developing undisturbed or agricultural lands which often occurs with "urban sprawl."

5.2.6 The Refuge (808 Urban)

808 Urban is a 501 (c) (3) grassroots Non-Profit Organization (NPO) self described as "a collective of community cultural workers: artists, organizers and volunteers committed to improving the quality of life for our communities through arts programming," according to the 808 Urban website, that mentors youths in creative and entrepreneurial aspects of urban arts. In short, the intent of 808 Urban is to prepare young artists for real world situations. The Refuge, 808 Urban's Kaka'ako based workshop currently located at 683 Auahi Street, provides a safe space for youths to collaborate with professional artists and peers while developing artistic

skills (Figure 25). It gives them a real world understanding of art as a trade and how to make a living as an artist or arts professional. The Refuge is also a site for creating introspective and expressive art as well as selling the art produced by 808 Urban mentees.

Community Consultation: Mr. John "Prime" Hina and Ms. Sierra Dew – 808 Urban

Founder of 808 Urban, John "Prime" Hina, and Co-Director and Program Manager of The Refuge, Sierra Dew, were interviewed together on 2 August 2013 by Kimberly Mooney of Pacific Legacy on site at The Refuge.

Mr. Hina began his art career in Hawai'i as a graffiti artist in the 1980s, before it was culturally accepted and typically illegal or associated with an array of illegal activities. Having experienced the dangerous lifestyle of an at-risk youth, Prime has a unique understanding of these kids' lives and the importance that artistic expression holds for them. With tough love and a passion for art, Prime keeps these aspiring artists on track and focused. He also understands the need for youths to be mindful of Hawaiian history and culture by incorporating traditional Hawaiian values into the art program and sharing traditional *mo'olelo* and the cultural landscape of the ancient Hawaiians. He also encourages the participants to fully embrace their own ethnic roots (e.g. Filipino, Japanese, Hawaiian, etc.) and to express it in their art. Much of his recent art projects tie in or focuses on his roots, providing a contemporary visual interpretation of traditional Hawaiian values and beliefs.

With a formal education in fashion and textile-arts as well as experience as a youth center volunteer and entrepreneur in the arts trade, Ms. Dew balances the 808 Urban and The Refuge collective. Growing up in the small Maui town of Pā'ia and being practically raised in the family store, Mana Foods, which is the most prominent cultural hub for the health and environmentally conscious in Maui, Sierra was rooted in a social movement that centered on feeding the bodies, souls, and minds of the community. With this background and her own experiences as a professional artist, she quickly saw the need for such a movement on O'ahu and wholeheartedly joined the 808 Urban cause.

Initially, 808 Urban was largely a mobile mentoring program for at-risk youth with the goal of urban arts and cultural education that started in Prime's backyard back in 2006. At that time, society in general did not embrace graffiti as art. Yet, Prime and Sierra recognized that this genre of art goes hand in hand with urban development. Being that the landscape was becoming increasingly urban, they felt that it was important to teach youths, who are largely influenced to destroy or deface buildings and walls; that they can instead work with business owners and developers as co-creators in integrating art into the urban landscape. Sierra and Prime added that the 808 Urban mentorship program was also designed to teach adolescents the importance of preserving and conveying the history of Hawai'i and celebrating its many cultures and ethnic groups through art. 808 Urban's mentorship program was intended to help aspiring young artists in a public school paradigm that devalues art and defunds art programs. After several years of operation, Prime and Sierra found the logistics of youth mentoring without a dedicated facility to be troublesome. In February of 2013, 808 Urban found a space in Kaka'ako to run the program out of and named it The Refuge. Although Chinatown with its vibrant people, sights, sounds, and smells has been the default location for emerging artists and where Prime spent a good portion of his youth, he felt that the adjacent community of Kaka'ako

was the better location for The Refuge. According to Sierra and Prime, the arts community of Chinatown benefits little from such events as First Friday and other street fairs that do more to diminish art and promote debauchery. Further, with Chinatown's relatively high density of bars, prostitutes, and homeless, both felt that it was not suitable as a permanent base for the program. To them, Kaka'ako was the natural choice for The Refuge, with its urban setting, multifaceted and open-minded community, rich background, affordability, centrality, and growing arts culture. Kaka'ako, as a community, has also become increasingly unified with a sense of shared culture and community interest. 808 Urban among other local artists in Kaka'ako have come to accept the impending development of the area; yet, they feel they have a responsibility to ensure that Kaka'ako maintains its cultural identity and honors its people as well as its past throughout the course of its development.

808 Urban and The Refuge have become unique and significant cultural resources for the arts community where aspiring young artists have the opportunity to work with and be mentored by a dynamic and diverse group of professional artists as well as non-artists who work within this community. Program mentors specialize in an array of conventional visual arts, film making, and graphic design as well as organizing events and other activities supporting the arts. The mentorship program, referred to as the Junior Board Initiative, is exceptional in that its mentors are professional artists, rather than educators, who understand how an individual can make a living from art in the real world. Prime holds that the mentorship program does not teach kids how to create art; it teaches them how to live and be successful as a professional artist. The program also allows youths to participate in the organization as board members, where they partake in decision making, fund raising, grant-writing, budgeting, and governance within the non-profit organization. They are given the opportunity to engage in real world, grassroots community organizing and activism, which potentially gives them the skills and courage to change the system or make it work to their advantage.

Mentees have the opportunity to express themselves in a way that does not break laws, but rather, helps them to be community oriented and work in accordance with the law. The program encourages their mentees to work with neighborhoods to help express its unique character through art. To date, 808 Urban's mentees have successfully installed numerous murals from Waipahu to Punahou by working with the respective communities. Sierra and Prime are working to expand the program to other islands.

Another facet of the program allows mentees to engage as entrepreneurs in the arts marketplace to experience first-hand the trial and error processes at an earlier age than most aspiring artists. These youths also have the support of 808 Urban *ohana* while testing the sometimes harsh waters of art entrepreneurship.

According to Sierra, The Refuge is like a "home away from home" and the participants are like family. For many aspiring artists, especially at-risk youths, a space conducive to expressing themselves is rare, so for those who are fortunate to make it into the program, The Refuge is exactly what its name suggests.

In regards to the proposed Kaka'ako TOD development, Prime and Sierra are concerned about the population increase that will follow vertical development putting further strain on

resources, such as water. They feel that the development should incorporate more architectural features that conserve resources, such as water catchment and rooftop gardens. So far, they hold that the proposed structures exhibit minimal measures to conserve resources. Sierra and Prime also worry that lease and utility rates will increase to a degree that 808 Urban and The Refuge would be forced out of the area.

Figure 25. 808 Urban's headquarters, The Refuge (view to the south).

5.2.7 Home of the Brave Tour

The Home of the Brave Tour is a family-owned and operated World War II tour and museum that is a one-of-a-kind repository and interpretive center designed to remember, honor, and salute those who served in World War II (Figures 26 and 27). The museum complex is hidden among Kakaʻako's warehouses and is fast becoming Kakaʻako's best kept secret. The museum provides public tours with admission fee to view literally thousands of World War II artifacts and memorabilia that provide unique insights into WWII and an intimate understanding of the soldiers and their experience. While the U.S. Arizona Memorial and other museums tend to render a visitor to solemnity and tears, the Home of the Brave Tour offers a well-rounded experience where the visitor feels as if they've transcended into a 1940s E-Club and can hear all of the amazing WWII war stories as the veterans themselves would have told them.

Community Consultation: Glen Tomlinson – Home of the Brave Tours

Home of the Brave Tours President, Glen Tomlinson, was interviewed by Kimberly M. Mooney of Pacific Legacy, Inc. at the Home of the Brave Tours museum complex on 27 November 2013 to provide further insights on the cultural significance of the Home of the Brave Tours and museum.

Home of the Brave Tours initially began as a bus tour of Hawaiʻi's WWII battlefields in December of 1991 to commemorate the 50th Anniversary of the attack on Pearl Harbor. As years passed, the tours grew in size. Due to the popularity of the tour, Mr. Tomlinson decided the tour needed a headquarters with a participant receiving area and gift store. Already in possession of an impressive WWII artifact and memorabilia collection, Tomlinson began showcasing his collection at the tour headquarters. When tour participants, mostly WWII veterans and their families, witnessed Tomlinson's passion for the era as well as his gift of storytelling and interpretive design, they began donating artifacts, personal memorabilia, and intimate stories of their experiences to Home of the Brave Tours museum. Other WWII collectors in the community came forward eventually and lent their collections to the museum to be shared with the public. As the Home of the Brave Tour's museum collections grew through donated and loaned artifacts, Tomlinson expanded the facility year by year into adjacent Historic structures, including a horse stable, incorporating many Historic structural elements into the new design. The museum has grown over the twenty years of its existence from a single room operation to a two-story complex with nearly a dozen rooms and niches filled from floor to ceiling with fascinating photos, replicas, and artifacts from the WWII and 1940s era.

Each room, niche, and display cabinet is themed and Tomlinson guides the viewer from room to room, interpreting the themes and recounting stories with such passion and proficiency that one would think he was a WWII veteran himself. The stories behind each picture or artifact, most of which have been handed down from his veteran tour participants, is worthy of being a Hollywood movie. The museum is also very hands-on, where you can have your photo taken sitting on a WWII era Army issue Harley Davidson motorcycle or a group photo in one of the two vintage army jeeps. With antique televisions and radios softly playing the sights and sounds of the 1940s, one could not help but feel as though they've been transported back in time.

The museum, which Tomlinson likes to call a "Brewseum," even has its own 1940s style *tiki* bar with outdoor lanai where tour participants can enjoy a hand-crafted Home of the Brave beer, root beer, or coke in a glass hobble-skirt bottle. Tomlinson is currently in the process of expanding into a nearby warehouse to house his upcoming banquet room and entertainment venue as well as the brewery for the hand-crafted beers produced by Tomlinson's sons. According to Tomlinson, the Home of the Brave Tour is currently considering an evening tour through the museum.

The Home of the Brave Tour is culturally significant for several reasons: 1) the museum is a repository and interpretive center showcasing thousands of artifacts and replicas that embody WWII; 2) Tomlinson and his trained tour guides have become cultural resources themselves as the custodians of countless WWII oral histories, many of which have not yet been recorded; and 3) we are losing our surviving WWII veterans at a growing rate, as the average WWII veteran is in their 90s. Thus, the Home of the Brave Tours preserves and shares these cultural resources in a way that is matchless. According to Tomlinson, their collections are invaluable because they represent the lives and accomplishments of our country's "Greatest Generation," of whom we are losing at a higher rate year by year.

Figure 26. One of Home of the Brave Tours and museum displays.

Figure 27. Home of the Brave Tours' "Wall of Fame" exhibiting photos of WWII veterans.

Currently, the Home of the Brave Tours and museum complex is firmly rooted in Kaka'ako from the unique Historic structure it is housed that has been painstakingly modified over twenty years to display the collections to its central locality and affordable rent. While parking is hard to come by, the Home of the Brave Tours is primarily accessed by tour buses. Tomlinson is considering expanding the hours of operations to increase visitation at present,

but holds that finding and employing specialized staffing, additional parking, and security of the many priceless artifacts are obstacles. In regards to potential impacts caused by Kaka'ako TOD Overlay project, Tomlinson's only concerns are that the property that houses his museum may be bought out and the museum would have to relocate.

5.3 Public Parks and Grounds

The majority of public parks and grounds are located in Kaka'ako Makai and are under the jurisdiction of HCDA. Kaka'ako Makai, Kewalo Makai Gateway, and Kolowalu Parks are located in the Kaka'ako TOD Overlay project area. Information regarding cultural activities occurring in these parks was largely obtained from published literature and community consultations.

For parks managed by the City and County (C & C) of Honolulu, Department of Parks and Recreation, information regarding all sanctioned activities was obtained from the parks permit registry, which was graciously provided by department officials to aid in this assessment. To add insight to selected cultural practices, community consultations were performed. Parks in and around the Kaka'ako TOD Overlay project area under the jurisdiction of C & C include Mother Waldron Neighborhood Park, Ala Moana Beach Park/McCoy Pavilion, and Thomas Park. According to the C & C, over five hundred thousand people participate in permitted events in Mother Waldron Neighborhood, Ala Moana Beach/McCoy Pavilion, and Thomas Parks (Table 15). Additionally, the annual estimate of casual visitors to these parks is approximately two million for the year 2013. No permit information was available for Irwin, Walker, or Sheridan Parks.

Table 17. City & County of Honolulu Parks 2012-2013 Annual Usage Summary

No. of Permits	Description	No. Of Participants
2,027	Ala Moana Park, Magic Island, Thomas Square: Picnic Permits	161,395
115	Ala Moana Park, Magic Island, Thomas Square: Special Events	272,770
139	Ala Moana Park, Magic Island, Thomas Square: Ongoing Permitted Activities	25,275
342	McCoy Pavilion: Special Events	24,065
10	Mother Waldron Neighborhood Park: Special Events	21,625
72	All Parks: Filming Permits	3,100
12	Ala Moana Park, Magic Island: Commercial Activity (scuba, surf)	1,560
2717	**All permitted activities**	**509,790**

5.3.1 Kaka'ako Waterfront Park

Situated on the southern terminus of the Kaka'ako Peninsula, which is located at the end of Keawe, Ahui, and Ohe Streets, is Kaka'ako Waterfront Park (Figures 28 and 29). This roughly 30-acre park was constructed over a former municipal landfill in 1992. Kaka'ako Waterfront park offers shore fishing and ocean access for body surfing, swimming, and diving as well as an amphitheater, a waterfront promenade, picnic areas, restrooms, trash cans, water fountains, and an expanse of rolling grass hills with observation areas to view Waikīkī and Diamond Head. Kaka'ako Waterfront Park also has 300 public parking spaces available. In addition, the park is home to two culturally significant memorials, including the Ehime Maru Memorial and the Mothers Against Drunk Driving (MADD) Victim Memorial. Currently, Kaka'ako Waterfront Park is under the management of the Hawaii Community Development Authority (HCDA), which issues permits to groups for large events.

Figure 28. Kaka'ako Waterfront Park promenade and public facilities (view to east).

The park is used daily by local residents, people who work in Kaka'ako or attend the nearby universities, people living in other communities on O'ahu, and tourists. Park visitors enjoy a wide variety of marine activities at Kaka'ako Waterfront Park's waters including body surfing, body boarding, surfing, swimming, diving, and fishing. Point Panic is held by many as one of O'ahu's best body surfing breaks and is sanctioned for body surfing only. Thus, several long-standing body surfing competitions are held at Point Panic several times a year, including:

- HASA Surf Series
- Redwings Memorial World Championship of Handboarding and Paepo Boarding
- Point Panic Bodysurfing Club's Hawaiian Bodysurfing Championship

Kaka'ako Waterfront Park is also utilized for an array of public recreational activities that don't require water, such as walking, jogging, roller skating, bicycle riding, yoga, tai chi, picnicking, sun bathing, and relaxing to name a few. This park offers Kaka'ako residents and workers a needed escape from the urban landscape of Kaka'ako. However, occasionally the park hosts larger events that people from all over the island participate in, including:

- Live music concerts held at the amphitheatre (various genres of music)
- The Love Festival (annual)
- Hele On Kaka'ako! (Kakaako 5k Run & other activities)
- Fireworks viewing (New Year's Eve and 4th of July)

Figure 29. Kaka'ako Waterfront Park Amphitheatre (view to north).

<u>Community Consultation: Mr. Wayne Takamine – Kaka'ako Makai</u>

To offer an insider's perspective on Kaka'ako Waterfront Park, Mr. Wayne Takamine, who is a long-time body surfer and surfer of Kaka'ako's waters as well as the Chair of Kaka'ako Makai Community Planning Advisory Council (CPAC) was consulted. Although the Kaka'ako Makai CPAC collaborates with HCDA and other planning consultants, Mr. Takamine was recommended by Ron Iwami (Friends of Kewalos) and Robert H. Richmond, Ph.D. (Research Professor and Director at Kewalo Marine Laboratory) as one of the most knowledgeable informants on recreational and cultural activities occurring in Kaka'ako Makai. Mr. Takamine was interviewed as a cultural informant by Kimberly M. Mooney of Pacific Legacy on 25 October 2013 at Kaka'ako Waterfront Park.

Kaka'ako Makai's parks and promenades, including Kaka'ako Waterfront Park, Kewalo Basin Park, Ala Moana Park, and Kaka'ako Gateway Park are utilized by a variety of individuals and cultural groups within the community on a daily basis. But, according to Mr. Takamine, water

sports and recreation enthusiasts are the largest cultural group that rely on Kakaʻako Makai. This group generally consists of fishermen, surfers, body boarders, body surfers, paddle boarders, paddlers/kayakers, swimmers, divers, and boaters. These water sports and recreation groups are comprised of individuals of all walks of life and hail from all areas of the island. Most water sports and recreation enthusiasts are driven by the surf and water conditions. Just as most parks do, these waterfront parks have their regular recreation enthusiasts who use the ocean for sport, recreation, and sustenance. When not actively surfing or recreating in the water, many of these people remain for extended times at the various waterfront parks to relax, picnic, and/or enjoy the panoramic shoreline views with fellow waterfront regulars.

People from across the island can be found participating in an array of activities, both organized and random, including jogging picnicking, barbequing, tai chi, cardboard sliding on grass slopes, and relaxing. There are also many music concerts held at the Kakaʻako Waterfront Park Amphitheatre. Newlyweds, mostly Japanese, can be seen taking wedding photos at the waterfront promenade as well. Several major events are attended at Kakaʻako Waterfront Park and other Kakaʻako Makai parks by thousands of people annually, including the 4th of July and New Years' Eve fireworks displays. Mr. Takamine holds that people from all over the island come as early as the night before the event to secure a good spot to view the fireworks.

There are several well-known surf breaks along the coast of Kakaʻako. The most renowned break for the area is Point Panic, located off of the east end of Kakaʻako Waterfront Park. Point Panic is one of the only breaks in town soley reserved for body surfing, which is regularly enforced to keep board surfers from dominating the waves. Mr. Takamine has been participating in the Redwings Memorial competitions at Point Panic for twelve years, but holds that the events have been going on for at least twenty years. He describes the events as large enough to occupy the entire southeast corner of the park and parking lot. The next surf breaks to the west are called "Flies" and "Incinerators." These names were given to the surf break at a time before Kakaʻako Waterfront Park existed and the "land" was actually the landfill refuse, which is now what lies beneath the park. These breaks are accessible to board surfers.

To the west of these breaks is a swimming cove that is protected by a sea wall with stairs leading into the water. Local kids as well as Micronesians can be found swimming and jumping off of the rock walls of the cove. Mr. Takamine holds that the long and deep culvert located west of Kakaʻako Waterfront Park is used for recreation by people who live at The Next Step homeless shelter, despite the fact that the culvert is frequented by large sharks.

Further to the west are popular fishing spots, where people fish by pole and spear both day and night. Fishing occurs all along the waterfront at different times of the day. An array of species are caught in these waters, but Mr. Takamine states that *pāpio*, *puhi*, and *hīnālea* are common catches *and uhu*, *weke, moana,* as well as *heʻe* can also be caught. He also has seen *ʻaʻama* crabs and small *ʻopihi* and *hāʻukeʻuke* on the rock sea wall. In the past he recalls there being regular schools of *āholehole* and *halalū*. He adds that the non-profit Kewalo Keiki Fishing Conservancy, which operates out of the west side of Kewalo Basin, is an important cultural resource for the area's youths.

Kakaʻako Waterfront Park also has several memorials, including the Ehime Maru Memorial, around which annual services are held for the victims of the tragic accidental sinking of the Japanese research vessel by a U.S. Navy Submarine. Another memorial is the Mothers Against Drunk Driving (MADD) Victim Memorial, which is visited by family and friends of victims on random occasions and scheduled memorial events. While these memorials were erected by the HCDA, the practice has been discontinued to ensure unobstructed recreational use of the remaining park open space.

Mr. Takamine's concerns regarding HCDA's management of Kakaʻako Waterfront Park and other coastal parks in Kakaʻako Makai, are as follows:

- maintaining and increasing open park space;
- maintaining open public access to our established ocean recreational areas;
- mitigating problems from adverse overcrowding and over-development impacts on cultural and recreational shoreline park uses;
- addressing ocean water quality concerns from storm water runoffs, as such may adversely impact and endanger shoreline recreation uses; and
- establishing a critical ocean safety and lifeguard facility to ensure effective first-responder and emergency treatment of shoreline park water users

As Chair of CPAC, Mr. Takamine recommends that CPAC's Kakaʻako Makai Vision and Guiding Principles be consulted to fully understand the cultural significance of the area and to responsibly plan development for areas included in Kakaʻako Makai. A copy of the Kaka'ako Makai Vision and Guiding Principles is provided in Appendix H.

5.3.2 Kewalo Basin and Park

While Kewalo Basin Park was thoroughly evaluated in the CIA for the Kewalo Basin Repairs Project (Genz and Hammatt 2010), several events and cultural practices were overlooked. For example, Genz and Hammatt (2010) identified four surf breaks "Marineland," "Straight Outs," "Rennicks/Right Next," and "The Point," off of Kewalo Basin, but it is important to add that these breaks are not only utilized by locals (Figure 30). Several times a year when the surf is high at these surf breaks, scores of water sports enthusiasts from all corners of the island gather to participate in or watch surfing, body boarding, and paepo boarding competitions. The three major competitions held in these waters are:

- HASA Surf Series
- Royal Richard Memorial World Championship of Paepo Boarding
- Redwings Memorial World Championship of Handboarding

Site inspections of Kewalo Basin and Park on the 2nd and 15th of August verified a variety of contemporary cultural activities in the basin as well as the park buildings and grounds.

Figure 30. Point Panic surf break with Diamond Head in background (view to east).

Community Consultation: Mr. Ronald Iwami and Mr. Thomas Iwai, Jr. – Friends of Kewalos
On behalf of Friends of Kewalos, Ronald Iwami and Thomas Iwai, Jr., were interviewed by Kimberly M. Mooney of Pacific Legacy, Inc. at Kewalo Basin Park on 15 August 2013 to provide further insights on the cultural significance of Kewalo Basin and Park. Mr. Iwami is a long-time Kewalos surfer and President as well as founding member of Friends of Kewalos, which started in 2005 as the grassroots organization, Kewalo Basin Park Association. In 2009, the association was renamed Friends of Kewalos and granted 501 (c) (3) Non-Profit Organization (NPO) status. Mr. Iwai is also a long-time Kewalos surfer, fisherman, fisheries and aquaculture consultant, and Board Member of Friends of Kewalos.

The mission statement of Friends of Kewalos is:

> To Protect, Preserve, and Malama Kewalo Basin Park and the surrounding shoreline and ocean, to ensure that the recreational user will continue to have access and the ability to enjoy the area for future generations to come (Friends of Kewalos 2013).

Friends of Kewalos represent and consist primarily of Kewalo Basin Park users, who come from all over Oʻahu to participate in an array of activities such as surfing, fishing, diving, picnicking, exercising, and relaxing – just to name a few activities. Kewalo Basin and its park, which is located within Kakaʻako Makai on the outside of the basin, unites many of its users as a choice location for these cultural activities and has been a "way of life" for those who have frequented the park for much of their lives. According to the Friends of Kewalos brochure, "It is a place where lifelong friendships have evolved and everybody knows your name. The parks' location in the heart of Honolulu, quiet charm, low-key atmosphere, and beautiful vistas of Diamond

Head and the ocean, keep all of us coming back" (Friends of Kewalos 2013). Thus, Kewalo Basin is an important cultural activity area that has developed a distinct culture shared by its regular users. The Friends of Kewalos embodies this culture and works with numerous water sports, business, watchdog, and conservation groups to *mālama* Kewalos and other localities within Kakaʻako Makai. Furthermore, Friends of Kewalos regularly organizes events to unite Kakaʻako's community and other Oʻahu residents for beach cleanups and peaceful rallies centered on keeping the beaches, waters, and parks of Kakaʻako Makai open to the public.

According to Mr. Iwami and Mr. Iwai, the coasts of Kewalo Basin and Kakaʻako Waterfront Parks are renowned for having excellent surf breaks, which are utilized by scores of surfers, body surfers, body boarders, and hand boarders. Surf breaks that line Kakaʻako's coast, such as "Marineland," "Straight Outs," "Rennicks," "Points," and "Point Panic" are locations that many of the above mentioned sports hold annual contests. Other cultural activities include swimming, paddling, and stand-up-paddling. Fishing and aquatic gathering are also common activities at Kakaʻako Makai beaches, where an array of reef and open ocean fish are caught. Also, *tako* or *heʻe* (octopus) is still speared off of Kewalo Basin Park using the glass bottom box methods and snorkeling. Both informants have witnessed several species of *wana* (sea urchin) being collected by Sāmoan and Micronesian families for food as well.

Mr. Iwami has a few key concerns regarding the proposed Kakaʻako TOD Overlay: 1) residential development of Kakaʻako Makai; 2) limited access to the coast for those who do not live in Kakaʻako; and 3) parking for the various beach parks and ocean access points. Keeping Kakaʻako Makai free of condos and timeshares has been a key concern for Mr. Iwami over the years. He advocates for "smart and responsible growth," where developers need to show the public the "big picture" and how the end product, which includes an influx of approximately 30,000 people, will impact infrastructure and traffic in already congested areas. In regards to accessing the coast from areas outside of Kakaʻako, Mr. Iwami is concerned that key thoroughfares used to travel from *mauka* to *makai*, including Ward Avenue, Punchbowl Street, Pensacola Street, and Piʻikoi Street, will be impacted by increased traffic created by the increased population and business. Due to the fact that he does not live in an area serviced by the proposed rail and that he has surfboards to transport, he would not likely use the rail to access Kewalo Basin Park. Therefore, his only option is to drive to and park at Kewalos, which is a situation shared by many other Kewalo Basin Park users. A personal vehicle may be the only feasible way to transport surfboards, diving gear, fishing tackle, or picnic supplies from areas outside of Kakaʻako. Thus, Mr. Iwami holds that free and ample parking spaces as well as open avenues leading to the coast are crucial to Kakaʻako Makai park, beach, and ocean users.

Mr. Iwai, who recently retired from the Hawaiʻi State Division of Aquatic Resources (DAR), has a unique perspective on the impacts of conservation laws on traditional and commercial fishing practices from his many years of employment at DAR. Because Mr. Iwai is himself a fisherman and aquaculture practitioner, he has strong concerns about the marine ecosystem as well as fishing rights. He holds that federal agencies, conservation organizations, and academic institutions that sponsored, created, and implemented wildlife conservation laws often disregarded the effects of these laws on local jobs and cultural practices, such as fishing for sustenance and/or livelihood. He suggests that many of these laws enter the books as temporary conservation measures, but become permanent over time with no further studies to

determine whether or not they are warranted, if the laws benefit the subject species, or even if they harm the marine ecosystem in the long-term. Further, Mr. Iwai maintains that Environmental Protection Agency (EPA) regulations are often based on mainland studies then applied to Hawai‘i, which has different environmental variables. Therefore, many regulations are not easily implemented, fail to protect natural resources, and are expensive. While he feels as though the laws have the right outcome in mind, they often have short-term positive outcomes andcause long-term negative effects on local fishing and aquaculture practices. According to Mr. Iwai, traditional fishing practices are already struggling for a variety of reasons. For example, the *Nisei*, which was the last remaining *aku sampan* (Traditional Japanese skipjack tuna boat), out of Kewalo Basin is no longer in operations due to high operational costs. Ultimately, Mr. Iwai's concern is that the proposed Kaka‘ako TOD Overlay will incorporate regulations or support legislation based on wildlife conservation studies that are not tailored to the local ecosystem or outdated, especially when the laws impact local marine based jobs and cultural practices.

5.3.3 Kaka‘ako Makai Gateway Park

Kaka‘ako Makai Gateway Park is 4-acres of open, flat grass field that is bound by Ala Moana Boulevard to the north, Cooke Street to the west, the parking lot for Kaka‘ako Waterfront Park to the south, and Ohe Street to the east. This park is also utilized for a variety of recreational and sports activities by Kaka‘ako residents and those who work or attend the nearby universities. Park users can be seen playing a variety of field sports, exercising, flying kites, and participating in other forms of recreation on a daily basis. Because of the large, flat expanse, this park is also a good venue for fairs, bazaars, rallies, and other public gatherings. Several events have occurred at Kaka‘ako Makai Gateway Park drawing visitors locally and from areas outside of Kaka‘ako, such as Kaka‘ako Kalikimaka, Aloha Pet Festival, and Film & Food: Pop-up in the Dark. This park is also managed by HCDA, who grant permits for park events. Site inspections of Kaka‘ako Makai Gateway Park on the 2nd and 15th of August 2013 verified a variety of contemporary cultural activities occurring at the park.

5.3.4 Mother Waldron Neighborhood Park

Although originally named Mother Waldron Playground, this park is often referred to as Mother Waldron Park and is now officially named Mother Waldron Neighborhood Park. The park, located within the project area, has been on the Hawaii Register of Historic Places since 1988 along with several other parks grouped under of the thematic group "City & County of Honolulu Art Deco Parks" (Site No. 80-14-1388). Mother Waldron Neighborhood Park has been recognized as a cultural resource for its history in previous CIA (Spearing et al. 2008; Elison & McElroy 2011; Elison 2013; Maly et al. 2013), however, no mention of what current cultural activities take place at the park. According to the C & C of Honolulu, Department of Parks and Recreation, in addition to an array of recreational and sports activities carried out by casual-use visitors on a daily basis, five permitted events (single day events and reoccurring) are scheduled for Mother Mother Waldron Neighborhood Park in 2013 (Table 18), totaling in nearly 22,000 participants for the year. Site inspections of Kaka‘ako Makai Gateway Park on the 2nd and 22nd of August 2013 verified a variety of contemporary cultural activities occurring at the park.

Table 18. Mother Waldron Neighborhood Park permitted activities and events for 2013

Organization	No. of days	No. of Attendees	Total	Purpose
Hawaii Jokgu Assn.	50	25	1250	Jokgu league
Ke Aloha Ho‘okahi Preschool	250	35	8750	P.E. activities
Voyager Charter School	250	45	11250	P.E. classes
Cycle on Hawaii	1	300	300	"Hele On Kaka‘ako" event
Olanui Church	1	75	75	Church picnic
Totals	**552**	**105**	**21625**	

5.3.5 Ala Moana Beach Park/McCoy Pavilion

Immediately to the south of the Kaka‘ako TOD Overlay project area is Ala Moana Beach Park, which includes the McCoy Pavilion located in Ala Moana Beach Park. This park, constructed in the early 1930s, encompasses approximately 76-acres of waterfront property, which consists of a 4000-foot long by 150-foot wide gentle-sloping sandy beach as well as the McCoy Pavilion, a lawn bowling complex, expansive grass fields, tennis courts, and a few small ponds. The waters of Ala Moana Beach feature a l000-meter long channel parallel to the beach that is protected by a reef. These calm water conditions make Ala Moana Beach Park a hot spot for swimmers, families with young children, and stand-up paddle surfers. The City and County Department of Parks and Recreation provided a list of all registered events occurring within Ala Moana Beach Park to aid with identifying cultural activities. Numerous long-standing cultural practices have been identified as occurring in or partially in Ala Moana Beach Park/McCoy Pavilion, including:

- Lantern Floating Festival
- Dragon Boat Festival
- Boy Scouts of America Makahiki
- Aloha Floral Parade
- Martin Luther King, Jr. Parade
- Greek Festival
- Talk Story Festival
- Pride Festival
- Honolulu Gay Pride Parade
- Lei Queen Selection events
- Hui Wa'a/OHCRA Canoe Paddling Practice & Races
- Interscholastic League of Honolulu (ILH) Canoe Races
- Honolulu Marathon & Triathlon
- Charity Runs & Walks (various causes)
- Baptisms (group and individual)
- Car Shows (various clubs)
- PetWalk (Hawaiian Humane Society)
- U.S. Tennis Association Lessons & Tournaments
- Gateball & Groundgolf

Community Consultation: Mr. Roy Ho - Lantern Floating Hawaii

The annual ceremony of Lantern Floating Hawaii at Ala Moana Park, which is officiated by the Buddhist Order, Shinnyo-en, and presented by Nā Lei Aloha Foundation, is becoming one of Hawai'i's most cherished memorial services. Lantern floating, as a ceremony, is an ancient and cross-cultural tradition that allows a community to share in the moment of remembering and honoring those we've lost by lighting a candle in their honor. The candles, which are set in a floating lantern, are set free at dusk in a symbolic gesture to be embraced by the wind and open waters. As the glowing lanterns float peacefully away from the devotee, the lantern joins countless other lanterns adrift together united by a synchronized gesture of aloha, peace, life, and love (Figure 31). While the floating lanterns are set free in a contained section of waters off of Ala Moana Beach Park and collected before entering the open ocean, the effect is still lasting and powerful. Lantern Floating Hawaii is a unique "water consolatory" ceremony that unites people from an array of religions, cultures, ethnicities, socio-economic backgrounds, and generations around a spiritual act that is centered on universal beliefs and emotions. According to the Nā Lei Aloha Foundation website (2013), "Lantern Floating Hawaii helps to open our hearts in an experience that transcends the human boundaries that usually divide us." The ceremony, now in its 16th year, attracts upwards of 50,000 participants from all walks of life to Ala Moana Beach Park every Memorial Day. Mr. Roy Ho, Executive Director of Nā Lei Aloha Foundation, was interviewed by Kimberly M. Mooney of Pacific Legacy, Inc. at the Nā Lei Aloha Foundation headquarters in Honolulu on 10 September 2013.

Figure 31. 2013 Lantern Floating Ceremony at Ala Moana Beach (photo courtesy of Nā Lei Aloha Foundation).

While the Lantern Floating Hawaii ceremony is open to the general public, its roots are grounded in Buddhism. According to Mr. Ho, Nā Lei Aloha Foundation is the "secular, community-building arm" of the Shinnyo-en Buddhist Order in Hawai'i. The foundation supports and gives contributions to a diverse group of charities and humanitarian causes in

Hawai'i. The name, Nā Lei Aloha, Hawaiian for "many lei of aloha," was given to the foundation in 2004 by the late, dearly loved Native Hawaiian cultural practitioner, Kupuna Aunty Malia Craver, on behalf of the foundation's mission of "bringing people together in cooperation and harmony" (Nā Lei Aloha Foundation website 2013). Shinnyo-en is a relatively new but International Buddhist sect that is founded on ancient Buddhist teachings in the Japanese Shingon tradition. Mr. Ho states that the term *shinyo* denotes "truth" or "spiritual awakening" and *-en* stands for "borderless garden." When both terms are combined, the expression embodies the following concepts: "truth beyond all temporal boundaries" or "truth open to everyone." Master Shinjo Ito, the late founder of Shinnyo-en, wanted to help people to awaken and attain enlightenment as Siddhartha did over 2,500 years ago, but not through countless lifetimes and reincarnations. In Shinjo's teachings, which are begotten from the Nirvana Sutra (thought to be by many as the Buddha's final teachings), enlightenment can be attained by all people who simply hold to a path of genuine altruism following the four key virtues of "lovingkindness, compassion, joy, and equanimity" (Shinnyo-en website 2013).

According to Mr. Ho, Her Holiness Shinso Ito, Head of the Shinnyo-en Buddhist community and daughter of Master Shinjo Ito, wished to foster cultural harmony and understanding in Hawai'i by organizing and enacting a lantern floating ceremony. The ceremony she created is based upon the Japanese tradition of lantern floating in the final stages of the Obon festival, which is ritual to honor ancestral spirits. While the Lantern Floating Hawai'i ceremony is held every Memorial Day, a federally observed holiday created to honor fallen military personnel, the lantern floating ceremony is designed to honor all of our departed loved ones. To promote inclusivity, the Lantern Floating Hawai'i ceremony is preceded by traditional cultural practices from various religions and cultures, including Native Hawaiian *oli* and *hula*. Further, Nā Lei Aloha Foundation provides free floating lanterns (one per family) to all that wish to participate, but also encourages devotees to make their own vessel to impart the vessel with their own energy and essence.

The first officiated the inaugural Lantern Floating Hawai'i ceremony was enacted on Memorial Day in 1999 with approximately 7,000 participants. The Lantern Floating Hawai'i ceremony was held annually at Ke'ehi Lagoon for its first three years, before being moved to Ala Moana Beach a few miles to the east where it has been observed every year since. Approximately 50,000 people from all walks of life were estimated to have participated in the 2013 Lantern Floating Hawai'i ceremony, which attests to the universal attraction and inclusivity of the ceremony. It is likely that the number of participants will continue to grow.

Enduring to maintain the spiritual integrity of the ceremony without harming the environment or burdening city services, Nā Lei Aloha Foundation/Shinnyo-en - with the help of members and volunteers - organizes and facilitates the event in its entirety. Mr. Ho explained that Nā Lei Aloha Foundation works with the City and County (C & C) of Honolulu and other groups, but takes full responsibility for the event. All donations to Nā Lei Aloha Foundation/Shinnyo-en for the event specifically are given to the C & C of Honolulu for any impacts caused by the ceremony. Many measures are implemented before and after the ceremony to prevent environmental impacts. The foundation prepares the ceremonial space by leading volunteers in a massive park and beach cleanup prior to setting up ceremonial and event structures. The foundation also sets out catchment lines offshore to keep the lanterns from floating beyond

reach and harming marine life. Following the ceremony, members of the foundation and volunteers carefully collect the floating lanterns, which are transported to a sanctified space and burned in a final ritual. Despite the rising number of participants over the years the ceremony has had no regrettable incidents, perhaps a factor in its growing popularity.

As with other major events at Ala Moana Park, access and parking for those coming from other areas on the island to participate in the Lantern Floating Hawai'i ceremony remains key. In regards to potential impacts caused by the proposed Kaka'ako TOD Overlay, Mr. Ho declined to comment.

Community Consultation: Ms. Michelle Wong – Hawai'i Dragon Boat Festival

The Hawai'i Dragon Boat Festival has become a major two-day festival that takes place each summer in Ala Moana Beach Park annually (Figure 32). The festival, which is open to the public, consists of several events, with Dragon Boat racing as the main event and other festivities such as grass volleyball tournaments, cultural exhibits, live local entertainment, and big screen feature movie, as well as local craft and food vendors. This family friendly event has grown to over 4000 participants since its establishment start in 1996. Michelle Wong, representing the Hawai'i Dragon Boat Association, contributed information on the Hawai'i Dragon Boat Festival in several emails, phone calls, and online questionnaire in August 2013.

While Dragon Boat Racing has become a contemporary world-wide sport and recreational activity, it is an ancient Chinese tradition that originally functioned as a means to commemorate the life and teachings of Qu Yuan, a beloved warrior poet, who committed suicide over 2000 years ago. According to the International Dragon Boat Federation (IDBF),

> The Dragon has a very symbolic meaning for the Chinese. A classic dragon has the head of an ox; a deer's antlers; the mane of a horse; the body and scales of a snake; the claws of an eagle and the tail of a fish. With its strength and power the Dragon rides the clouds in the sky and commands the wind, mist and rain.
>
> The Dragon Boat is deeply embedded in China's 'Dragon' culture, with each Boat having an ornately carved dragon's head at the Bow and a tail in the Stern. The Hull is painted with the Dragon's scales. The paddles symbolically represent the claws. In IDBF Sport Racing there are generally 18-20 paddlers per Standard size Dragon Boat and 8-10 paddlers in the Small Boat, plus a drummer and a helm (Steerer). In Traditional Festivals the boat designs and crew numbers can vary from 10 up to 50 or more paddlers, plus of course the Drummer and Helm.
>
> The races are a colourful spectacle, with at least two boats competing against each other over distances from 200 to 2000 metres and above. Not only are strength, endurance and skill important but teamwork and harmony of purpose.
>
> In ancient China the Dragon Boat was used for religious purposes as a way of appeasing the rain gods. Later Qu Yuan, the great warrior poet, committed suicide in the river Mi Lo, as a protest against the political corruption of the day. To commemorate this sacrifice the people began to organize Dragon Boat Races in his memory. Since that time over 2000 years ago, Dragon Boat Racing has

become a major part of Chinese culture, representing patriotism and group integrity (IDBF 2013).

Figure 32. Dragon Boat at Ala Moana Beach Park (photo courtesy of Hawai'i Dragon Boat Association).

In keeping with tradition, teams of colorful dragon boat racers power their canoes forward in sync with the rhythm of pounding drums at the Hawai'i Dragon Boat Festival. According to Ms. Wong, "Former Mayor Jeremy Harris and the late Honorary Mayor of China Town Mr. Sun Hung (Sonny) Wong were able to secure the donation of 3 traditional Dragon Boats from Honolulu's Sister City, Kaohsiung. With the 3 boats, the Festival has continued to grow to include other sports such as volleyball to attract more people, both native and visitors, to join together in participation, camaraderie, and a lot of fun" (M. Wong 2013). She adds that the Hawai'i Dragon Boat Festival held at Ala Moana Beach Park are enjoyed by a wide variety of groups, including "local cultural based organizations to Hawaiian and national organizations and companies" (M. Wong 2013). Ms. Wong holds that the Dragon Boat Festival is significant to the community, as it brings a lot of people together as a group, which "…enhances public enjoyment and appreciation of Ala Moana Park and makes Honolulu a more exciting place because there are different and unique events going on" (M. Wong 2013). The community, according to Ms. Wong, consists of people from many areas outside of Kaka'ako as well as within, stating:

> People come from different areas for the event. It is events and activities such as this that make the Community a great place to be. These events attract people,

> and with the greater number of people coming to the area there will be more commerce, whether it is the gas used for transportation to the site or the food and supplies the people bring or purchase for the event (M. Wong 2013).

Thus, the 17 year running annual Hawai'i Dragon Boat Festival brings people together from all over O'ahu, and perhaps beyond, to participate in an ancient Chinese festival that now integrates contemporary sports and recreational themes that appeal to people of all walks of life.

In regards to potential impacts caused by the proposed Kaka'ako TOD Overlay, Ms. Wong feels that there should be no impacts to the Hawai'i Dragon Boat Festival held at Ala Moana Park, unless as she states, "it takes away the park and surrounding parking" (M. Wong 2013).

5.3.6 Irwin Memorial Park

Across Bishop Street of the HECO Downtown Power Plant portion of the project area is Irwin Memorial Park, which was constructed in 1930. This park is approximately two acres of open shaded grass lawns with a long promenade running *mauka* to *makai* through the center and an inoperable water fountain at its heart (Figure 33). The park offers a choice location with numerous concrete tables and stools, which encircle the water fountain. No cultural activities were identified as occurring at the park through documentary research. A site inspection performed on 10 August 2013 by Kimberly M. Mooney of Pacific Legacy, Inc. failed to identify any specific cultural practices occurring at the park, though being one of the few open space parks in the area, the likelihood of cultural activities occurring at Irwin Memorial Park is high.

Figure 33. Non-operational Water Fountain at Irwin Park (view to north).

5.3.7 Thomas Square

Historic Thomas Square is a 6.5 acre open space park located across King Street of the northern border of the Kaka'ako TOD Overlay project area. This park, dedicated in the 1840s, is registered in the State and National Register of Historic Places (Reference No. 72000423; State Site No. 80-14-9990) due to its role in Hawaiian history as the location that Kamehameha III held a ceremony to reinstate the Hawaiian Kingdom's sovereignty after being temporarily overtaken by the British Lord, George Paulet. According to the Thomas Square NRHP Nomination Form:

> In early 1843, Lord George Paulet, representing the British Crown, overstepped his bounds, landed sailors and marines, seized the government buildings in Honolulu and forced the King (Kamehameha III) to cede the Hawaiian kingdom to Great Britain. Paulet raised the British flag and issued a proclamation formally annexing Hawaii to the British Crown. Queen Victoria, on learning the injustice done, immediately sent an envoy to the islands to restore sovereignty to its rightful rulers. The man chosen for this task was Rear Admiral Richard Thomas, and on July 31, 1843, pompous ceremonies were held whereby the Hawaiian Kingdom was restored. It was on the occasion of the restoration that Kamehameha was moved to say, "Ua mau ke ea o ka aina i ka pono" -- The life of the land is restored in righteousness. (This statement has since become the official motto of the State of Hawaii.)
>
> From July 31, 1843, the plot of land on which the ceremonies took place was known as Thomas Square. Kamehameha III later officially gave this, name to the area and dedicated it as a public park. In 1850, the Privy Council voted to enlarge the square, and in 1925, a Joint Resolution of the legislative session set aside Thomas Square as a public park and placed it under the management of the Park Board of the City and County of Honolulu. It remains this today (NRHP 1972:3).

In addition to being historically significant, Thomas Square is currently used for a variety of cultural practices and events (Table 19). The annual Honolulu Intertribal Powwow held by the Northern Cherokee Nation has been ongoing since 1974. The Honolulu Intertribal Powwow website describes the event as follows:

> The first ever Honolulu Intertribal Powwow began in October 1974 with a small group of interested Native American individuals who longed for a place to celebrate their culture through music, drumming, dance, food and sharing their native arts and crafts. Many of them either came to Honolulu via military service, had family members who left their reservations and inter-married with native Hawaiians and other diverse ethnicities in the islands, or through adoption and being raised in an island culture and far from their native reservations (Honolulu Intertribal Powwow 2013:home).

Several Native Hawaiian events also take place annually at Thomas Square that are culturally significant, including the Hui Mau Ke Ea gathering and Ilima Kumu. A high frequency of dog shows take place at Thomas Square, which can be considered cultural practices for those within the dog enthusiast communities.

Table 19. Thomas Square Permitted Activities and Events for 2013

Organization	No. of days	No. of Attendees	Total	Purpose
Aloha State Sporting Dog Assn	2	100	200	Dog show
American Cancer Society	1	500	500	Bark for Life
Collie Club of Hawaii	4	100	400	Obedience trials
German Shepherd Dog Club	1	100	100	Dog show
Golden Retriever Club of Hawaii	2	100	200	Dog show
Handcrafters & Artisans Alliance	2	500	1000	Craft Fair
Hawaiian Herding Dog Assn.	2	50	100	Dog show
Hawaiian Hound Assn.	2	50	100	Dog show
Hawaiian Humane Society	1	500	500	Canine Game Day
Hawaiian Terrier Assn.	2	80	160	Dog show
Hui Mau Ke Ea	1	400	400	Hawaiian Cultural gathering
Ilima Kumu	1	150	150	Club picnic
Japanese Ministry of New Hope	1	50	50	Church service
Landscape Industry Council	4	300	1200	Plant show and sale
Northern Cherokee Nation	2	1000	2000	Powwow
Obedience Training Club of HI	11	75	825	Obedience trials
Our Lady's Prayer Group	1	200	200	Prayer group
Poodle Club of Hawaii	1	60	60	Dog show
Shetland Sheepdog Club of HI	2	80	160	Dog show
Siberian Husky Club of HI	2	60	120	Dog show
Tropical Toy Dog Fanciers of HI	2	60	120	Dog show
Miscellaneous	10	25	250	
Ongoing: non-permitted but coordinated with Dog clubs	250	10	2500	
Totals	**39**	**4550**	**11295**	

5.4 Memorials and Commemorations

A total of four memorials and commemorations have been discovered within or adjacent to the Kakaʻako TOD Overlay project area that have not been identified in previous CIA.

5.4.1 Ehime Maru Memorial

The Ehime Maru Memorial, located in Kakaʻako Waterfront Park, was dedicated on 9 February 2002 to honor the victims of the disastrous accidental sinking on 9 February 2001 of the Ehime Maru, a Japanese Fishery High School training ship, after its collision with the US Navy submarine, the USS Greenville (Figure 34). The tragic event is thoroughly described in the National Transportation Safety Board's "Marine Accident Brief: Collision between the U.S. Navy Submarine USS Greeneville and Japanese Motor Vessel Ehime Maru near Oahu, Hawaii, February 9, 2001" (NTSB 2013), which is provided in Appendix G.

Figure 34. Ehime Maru Memorial at Kakaʻako Waterfront Park (view to south).

Community Consultation: Mr. Ed Hawkins - Ehime Maru Memorial Association

Mr. Ed Hawkins, President of both the Ehime Maru Memorial Association (EMMA) and the Japan-America Society of Hawaiʻi (JASH), contributed information regarding the Ehime Maru Memorial and EMMA's role in maintaining the memorial via telephone communications, emails, and online questionnaire from July through August of 2013.

The Ehime Maru Memorial was designed by Uwajima Fisheries High School graduate, Kyosuke Tamai and is composed of nine black granite blocks that support the Ehime Maru's salvaged one-ton anchor with nine links of its chain still attached. Engraved in stone in English and Japanese is the following inscription: "This honors the nine precious lives lost and serves as a place where their souls are remembered" as well as the names, titles, and ages of the nine victims, a summary of the tragic event, the school emblem, and a map showing the accident site,

the site of the Navy's recovery effort, the ship's final resting place as well as the Aloha Tower. The memorial is surrounded by stainless steel bollards and chains.

According to Mr. Hawkins, the Ehime Maru Memorial was erected a year after the catastrophic incident. The formal memorial service is held annually on the day of the tragic event for "…bereaved family members, representatives from the city of Uwajima in Ehime Prefecture (home port of the Ehime Maru), Ehime government representatives, representatives of the U.S. Navy, and Hawaii residents" and "…is attended by Hawaii's Governor and Mayor of City of Honolulu and their representatives)" (Hawkins 2013). Since its inception in November 2001, EMMA arranges two professional cleanings a year and volunteer cleaning weekly, which is carried out by Japanese-American groups (Kenjinkai, Honolulu Japanese Chamber of Commerce), Japanese student visitors, Japan Self Defense Forces personnel who visit Hawai'i. He further states that EMMA provides the maintenance through a stipend provided annually by the Ehime Prefecture government" (Hawkins 2013). Thus, the victims of the Ehime Maru's accidental sinking are still honored at this memorial regularly.

Mr. Hawkins holds that "As long as the subject development does not interfere with the annual memorial service" in regards to potential impacts caused by proposed Kaka'ako TOD Overlay. Further, he states that "Cleaning arrangements can be adjusted based on the development schedule" (Hawkins 2013).

5.4.2 MADD Memorial

The Mothers Against Drunk Driving (MADD) Victim Memorial was created in March of 2003 to remember individuals who were injured or lost their lives in impaired driving crashes (Figure 35). Regular visits, ceremonies, and candle light vigils at the memorial continue to serve the bereft and honor the victims of drunk driving incidents as well as violent crimes. The MADD Victim Memorial is located at the Ewa end of Kaka'ako Waterfront Park, behind the John A. Burns School of Medicine, and is designed to accommodate large groups, long visits, and disabled visitors.

Community Consultation: Ms. Abigail Nickell - MADD Hawai'i Victim Memorial

Ms. Abigail Nickell, Executive Director of MADD Hawai'i, shared information regarding the MADD Victim Memorial via emails and an online questionnaire during July and August of 2013.

Ms. Nickell stated that, "During MADD Hawai'i's 15th anniversary commemoration in March 1999, a dream was born to give our community a victim memorial to remember individuals who were injured or who had lost their lives in impaired driving crashes and other violent crimes" (Nickell 2013). She holds that such a memorial was essential for the community, stating:

> All over the world, victims of highway crashes die relentlessly every day, every month, every year. Most likely they are unpublicized deaths, only occasionally attracting the attention of the press. But those left behind experience the same horrible, traumatic grief known to all those losing a loved one in a sudden violent criminal act. MADD believes these victims deserve to be remembered

> and their families deserve to have a special place to visit, reflect, and mourn… MADD believes the community deserves to see a tangible reminder of the senseless deaths of so many of its citizens in order to remember that we all have the power to stop these tragedies (Nickell 2013).

Hence, the MADD Victim Memorial stands to honor the victims, but also stands as a reminder to the community at large of the absolute and detrimental effects that drunk driving and other violent crimes can have on fellow citizens.

Figure 35. MADD Victim Memorial at Kaka'ako Waterfront Park (view to northwest).

The dream of a victim memorial was realized in March of 2003 with former Governor Linda Lingle, former First Lady Vicki Cayetano, MADD National President Wendy Hamilton, and bereaved father, Mr. Robert Gore speaking for the dedication of the sculpture. John Tanji Koga, an esteemed Honolulu sculptor, lent his talents to create the 13-foot high abstract sculpture of three adjoined family members, each with mid-chest circular voids. As Ms. Nickell elucidates, "The bronze work poignantly depicts a family trio, each with a void where the heart would have been. Years may go by but the emptiness in the hearts of victims' families will always remain" (Nickell 2013).

Ms. Nickell holds that as long as a peaceful atmosphere is maintained at the MADD Victim Memorial, it will not be negatively impacted by the proposed Kakaʻako TOD Overlay. She states, "Developing the area could potentially bring more foot traffic to the memorial and more attention to the dangers of drunk driving and other violent crime, which would be wonderful. We would hope that the increased development would not significantly change the peaceful atmosphere of the Victim Memorial, as it was designed to be a place of reflection, remembrance, and mourning" (Nickell 2013).

5.4.3 Nagasaki Peace Bell

The Nagasaki Peace Bell is located on the Frank F. Fasi Civic Grounds of Honolulu Hale (City Hall), along Beretania Street near Lauhala Street, which is one block to the northwest of the proposed Kakaʻako TOD Overlay project area. The monument was dedicated on 7 December 1990 with a delegation of more than sixty Nagasaki Hibakusha, or surviving victims of the Nagasaki atomic bombings, in attendance. While the primary function of the monument is for honoring all victims of the atomic bombings at Nagasaki as well as an acknowledgment of harmful actions played out during World War II, the Nagasaki Peace Bell has also come to be associated with Dr. Martin Luther King, Jr., a world renowned peacemaker and promoter of non-violence. Since its erection, every year the bell has been rung ceremonially on August 9th in remembrance of the Nagasaki atomic bomb victims and on the third Monday of January each year for Martin Luther King Jr. Day to protest the manufacture and use of nuclear weapons.

Community Consultation: Ms. Marsha Joyner - Nagasaki Peace Bell

Ms. Marsha Joyner, Co-Chair of the Nagasaki Peace Bell Ringing Ceremony, provided information through emails and telephone communications in July 2013.

The Nagasaki Peace Bell is a replica of the bell from the tower of Urakami Cathedral in Nagasaki, Japan, which is a bronze bell that is suspended by four steel supports and topped with a life-sized bronze sculpture of a flying crane. According to Ms. Joyner, the bell was a gift to City and County of Honolulu from the City of Nagasaki, Japan.

Participants in the 2013 Nagasaki Peace Bell Ringing Ceremony consisted of the Dr. Martin Luther King, Jr. Coalition – Hawaiʻi, The Royal Hawaiian Band, Friends of the Gensuikin, Nagasaki Kenjinkai (Association of Descendants of Immigrants from Nagasaki Prefecture), United Nations Association Hawaiʻi Chapter, International Peace Poem Project, and the Chamber of Commerce for Persons with disABILITIES – Hawaiʻi as well as the general public.

5.4.4 Florentino Das Commemorative Plaque

Over twenty years before the epic voyage of the Hōkuleʻa from Hawaiʻi to Tahiti, Florentino Das set off on his trans-oceanic solo voyage from Kewalo Basin, Oʻahu, to his native Philippines on 14 May 1955. A commemorative plaque has been installed at Kewalo Basin Park to honor this brave Filipino (Figure 36).

Figure 36. Florentino Das Commemorative Plaque at Kewalo Basin Park (close up).

Community Consultation: Dr. Serafin Colmenares - Florentino Das Story

Scholar on the life and achievements of Florentino Das and co-author of the book, *Bold Dream, Uncommon Valor: The Florentino Das Story* (Colmenares et al. 2013), Dr. Serafin Colmenares contributed further information on Mr. Das and his sentiments on the importance of the memorial plaque at Kewalo Basin via emails, online questionnaire, and personal exchanges.

Florentino Das was born in Allen, Northern Samar Island, Philippines in 1918 and came to Hawaiʻi in 1934 at the age of 16 as a stowaway on a British freighter heading to the United States. Das survived initially in Hawaiʻi doing various odd jobs and eventually he became a boat builder, carpenter, and mechanic as well as a noted prize-fighting boxer. He married and raised a family in Māʻili, Oʻahu, while working at the Pearl Harbor shipyard. Despite his accomplishments in Hawaiʻi, Mr. Das felt compelled to make a pilgrimage back to the Philippines for several reasons: to provide a brighter future for his family in Hawaiʻi, to help the family he left in Samar, and for Filipino pride (Colmenares et al. 2013: 28).

To make the journey, Florentino modified a 24 foot wooden boat by hand for trans-oceanic voyaging and renamed the vessel, Lady Timarau, which was powered only by a canvas sail and two 25-hp outboard motors for maneuvering in harbors. On 14 May 1955, Das began his voyage from Kewalo Basin, Oʻahu, to his homeland, the Philippines. Navigating only by the stars and a simple compass, Mr. Das was able to cross 5,000 miles of the Pacific through numerous storms in just under a year with no means to communicate with the rest of the world. After a few stops in Micronesia, the Lady Timarau landed on Siargao Island in the province of Mindanao, Philippines on 25 April 1956, before continuing on to his birthplace of Northern Samar Island, Philippines. Although he was advised by his sponsors to abort his mission, Mr. Das refused to give up, as he believed that Filipino national pride was at stake. Upon his arrival in Manila, Florentino Das was welcomed by his homeland and honored by Philippine President Ramon Magsaysay with the honorary title of Commodore of the Philippine Navy as well as the Legion of Honor. However, no honors were given to Mr. Das in Hawaiʻi and his triumphant voyage was celebrated by few. The fanfare over his accomplishment eventually faded in the Philippines and Florentino Das' fame and affluence waned as did his health. Mr. Das succumbed to illness and passed away in Manila on October 7, 1964, at the young age of 46 - never to return to his family in Hawaiʻi (Colmenares et al. 2013).

A commemorative plaque was dedicated to Florentino Das at the main pavilion of Kewalo Basin Park in 2006 as one of the major activities undertaken by the Filipino community during the centennial celebration of Filipinos' arrival in Hawaiʻi, according to Dr. Colmenares. The production and installation of the plaque was initiated and implemented by the Congress of Visayan Organizations through the Filipino Centennial Celebration Commission and approved by the Hawaii Community Development Authority. As Florentino Das was a Filipino of Visayan origin, Dr. Colmenares holds that it was a fitting tribute for the members of the Congress of Visayan Organizations (COVO) and the Oahu Visayan Council to bestow on behalf of one of their own. The memorial highlights one of the major achievements of the Filipino community in Hawaiʻi and, thus, is a significant cultural resource for all Filipinos. According to Dr. Colmenares, "the plaque symbolizes the triumph of hope over adversity. It showed that dreams can be fulfilled. It proved that the Pacific can be conquered, and is an example of how the Pacific peoples might have traveled across the vast oceans - certainly a forerunner of the Hokuleia and other present-day voyaging activities" (Colmenares 2013).

The Florentino Das Commemorative Plaque is a bronze embossed tablet that is mounted on a north facing pillar at the central opening of the main pavilion of Kewalo Basin Park (Figure 36). The 18 inch by 24 inch plaque describes Mr. Das' solo voyage from Kewalo Basin to his native Philippines as well as a short biography of Mr. Das and a depiction of his vessel, the Lady Timarau.

Regarding the proposed Kakaʻako TOD Overlay, Dr. Colmenares believes that the project may increase the chances for the site to become a tourist destination (Colmenares 2013).

5.5 Religious and Spiritual Gathering Places

A total of eleven Religious or Spiritual Gathering Places were identified within or adjacent to the Kakaʻako TOD Overlay project area. These institutions provide a space for public worship, ceremonies, celebrations, atonement, and/or spiritual reflection, which are cultural practices for those within a spiritual community or religious sect. Of the eleven Religious or Spiritual Gathering Places, 4 long-standing institutions were identified and described below.

5.5.1 First Chinese Church of Christ

The First Chinese Church of Christ is located on 1054 South King Street and located across South King Street of the project area. The main structure of the church was built in 1929 and is a novel integration of Chinese and Western architectural styles. In addition to its contemporary cultural use, the antiquity of the Church and unique architecture suggest that this church is eligible for NRHP status. The church has an active congregation and meets regularly on Sundays for worship.

5.5.2 Kawaiahaʻo Church

Kawaiahaʻo Church, located in the northwest corner of the project area, is a component of the Hawaiʻi Capitol Historic District, which is on the State and National Register of Historic Places (NRHP Reference No. 78001020; State Site No. 80-14-1321). A full description of the Historic church is provided in the NRHP Nomination Form (NRHP 1978b), which is provided in Appendix E. Since its erection in the early 1840s, Kawaiahaʻo Church has been the center of cultural events for the entire island community. Kawaiahaʻo Church continues to be a favored setting of important events and ceremonies. The Church and its grounds have been recognized in previous CIA as culturally significant in the past. However, it is important to note that Kawaiahaʻo Church remains to be a major cultural hub for Christians as a cultural group and for the general community of Kakaʻako. The church hosts regular and special events that are open to the community, such as craft fairs, physical fitness classes, youth programs, and Christian based education programs. Site inspections of Kawaiahaʻo Church on the 2nd and 22nd of August verified the contemporary cultural usage of the church and its grounds.

5.5.3 Ke Alaula Oka Malamalama

The Ke Alaula Oka Malamalama (The Bright Morning Rays of the Church of Reasonable Service) is located at 910 Cooke Street. According to (Ritz 2002) the church, which is a mixture of Protestant and Hawaiian faith, is one of the oldest churches in the state. She holds that the Founder, Reverend J.H. Poliwailehua, was called to faith in 1853 and initiated the Christian sect in the 1880s. It is said that Queen Liliʻuokalani preferred this church to Kawaiahaʻo (Ritz 2002). To this day, the sermons are mostly delivered in Hawaiian as are the hymns. The church continues to serve the community of Kakaʻako and has a congregation of approximately 300 hundred members.

5.5.4 Makiki Christian Church

Makiki Christian Church is located at 829 Pensacola Street, which is situated in the northeast corner of the project area. The Makiki Christian Church was added to the State Register of Historic Places (Site No. 80-14-9719) in 1988 and was identified as a cultural resource in

Spearing et al. (2008) as a Historic structure in Kakaʻako. However, no mention was made about its current cultural significance. This church has been in operation since 1904 and continues to serve the community of Kakaʻako in Japanese and English.

5.6 Public Art Installation & Entertainment Centers

While Kakaʻako has a colorful past, people who live, work, and travel from afar have come to identify Kakaʻako as its own district with a progressive, freethinking, and counter-culture atmosphere. Kakaʻako has, among many, a growing urban culture that is united by the arts (i.e. visual, musical, & performing) and is fast becoming what the community of Kakaʻako identifies with. As a result, Kakaʻako has become a vital hub for the modern arts movement in Hawaiʻi. Artists and art enthusiasts are beginning to flock to Kakaʻako for the many cultural resources it has to offer. Several public art installation and entertainment centers provide the general public access to art and artists a venue to share art, which are both important cultural practices.

5.6.1 POW! WOW!

POW! WOW! is a year round contemporary and Urban arts movement, which is centered around a week-long mural festival in Kakaʻako held annually in mid-February. The main POW!WOW! event has grown to unite over a hundred international and local artists in the creation of murals and other art forms at various publicly viewable locations of Kakaʻako (between Queen Street and Ala Moana Boulevard)(Figures 37 and 38). Since its inception in 2010, POW! WOW! as an organization has developed into a global network of artists and has put together dozens of local arts exhibits, lecture series, mural projects, concerts, a school for visual art and music, and a large creative space named Lana Lane Studios. POW! WOW! is also responsible for organizing several live art installations across the globe.

Community Consultation: Mr. Jasper Wong - POW! WOW!

Jasper Wong, Founder and Lead Director of POW! WOW!, contributed information about the arts organization via emails and online questionnaire between July and August 2013.

According to the organization's website, the name POW!WOW! was chosen for the organization based upon the following ideas:

> POW! – It's the impact that art has on a person. A punch in the face.
> WOW! – It's reaction that art has on a viewer. A sense of awe and wonderment.
>
> Together they form POW! WOW!, which is a term that describes a gathering that celebrates culture, music and art (J. Wong 2013b).

In 2010, Mr. Wong held the first POW! WOW! Urban mural art event in Hong Kong as a means of creative expression for himself and other Urban or Street artists. In organizing the event, he formed a collective of artists, together starting a gallery that is still in operation in the city of Hong Kong. POW! WOW! 's main event in 2013 had expanded to include 100 artists hailing from Hawaiʻi as well as Austria, South Africa, Japan, Australia, and UK creating 40 murals in Kakaʻako over the span of a week. As POW! WOW! heads into its fifth year, Wong plans to expand "across the nation and globally" (J. Wong 2013a). Locally, POW! WOW! has become a

major player in the growing arts movement in Kakaʻako, contributing many significant visual landmarks in the evolving cultural landscape of Kakaʻako.

POW! WOW! is a multifaceted arts collective and cultural resource, that provides "artistic expression, cultural sharing, and beautification of a neighborhood through art" for the community (J. Wong 2013a). It also educates the community at large, especially its youth, about contemporary Urban or Street art and its importance as a legitimate form of expression in a community such as Kakaʻako. POW! WOW! offers several unique youth educational programs that highlight urban art and culture in a safe, legal setting. Another significant aspect of POW! WOW! to the local arts community is that it helps support the arts economically and connects Hawaiʻi to a greater community of international artists as well as the global economy (J. Wong 2013a).

According to Mr. Wong, POW! WOW's School of Art is a collective effort between POW! WOW! and 808 Urban, where students from local schools participate in a nine month art centered mentorship program (J. Wong 2013a). Art workshops, held by 808 Urban's John "Prime" Hina, are available through this program weekdays after school and on Saturdays in Kakaʻako's industrial district. The workshops are designed to do the following:

> ….explore contemporary urban art and its influence on commercial culture from the 1950s to the present…Students will discuss changing societal concepts regarding contemporary public "street" art while exploring a variety of artistic concepts, including basic design, color theory, and symbolism. Additional elements that will naturally come from these workshops include self-expression, and cultural awareness, as well as respect for community and nature. These workshops are an effort to prepare students for future POW! WOW! Hawaiʻi gatherings. The more art these students do in preparation for these gatherings, the more the students will be able to learn from these national and international urban artists. The hope is that the participating students will be able to conceive, develop, and collaborate on a large mural in Kakaʻako as part of POW! WOW! Hawaiʻi…The ultimate mission is to validate student art experiences and introduce young people to various forms of public expression. Working closely with 808 Urban to continue to support a gathering of contemporary artists that engages with the broader community in the process and creation of art. The final product of the project will beautify a portion of the students' urban landscape (J. Wong 2013a).

Schools that have participated in POW! WOW!'s education program include Kamehameha Schools, Roosevelt High School, McKinley High School, Voyager Charter School, Punahou School, Farrington High School, Mid-Pac Schools, Maryknoll School, La Pietra School, and Washington Middle School as well as the YMCA (J. Wong 2013a).

POW! WOW!'s School of Music partners with Flexfit, LLC, a global custom hat vendor, to provide Hawaiʻi's youth with a unique music education program that offers a select group of local musicians between the ages of 13-18 the opportunity to learn composition, vocals, percussion, guitar, ukulele, keyboard, bass, recording, performance and the music business from local and international musicians and music industry professionals. Through this

program, students have the opportunity to collaborate with one another to create original music and have the opportunity to perform for the public at the conclusion of POW! WOW! Hawai'i's main event (J. Wong 2013a).

Figure 37. ***The Hawaiian Gods Wall*****, created by artists, Prime, Estria, Trek6, and Mike Bam (photo courtesy of POW!WOW!).**

Figure 38. The Mahalo Wall, created by artist Eric Marcinizyn (photo courtesy of POW!WOW!).

Mr. Wong holds that the proposed Kaka'ako TOD Overlay may have a positive effect as well as negative impacts on POW! WOW!'s programs and events. "An increase in viewers of the murals and participation in related initiatives and activities…" as Mr. Wong (2013a) states, would benefit POW! WOW! Hawai'i. Yet, he holds "…increased property value might lead to less owners open to art on their property," which would cause considerable impacts to the organization.

5.6.2 Neal S. Blaisdell Concert & Exhibition Complex

The Neal S. Blaisdell Concert and Exhibition Complex, most commonly referred to as 'The Blaisdell,' is located on 777 Ward Avenue and situated centrally within the project area. The complex is comprised of a multi-purpose arena, exhibition hall, galleria, concert hall, meeting rooms, and parking structure. Since 1964, the Blaisdell has provided the island of O'ahu with 'big ticket' entertainment and access to arts and culture on a scale almost unmatched in the state. The complex is nearly eligible for NRHP status.

5.6.3 FreshCafe & Loft in Space

The Fresh Cafe and Loft in Space located at 831 Queen Street, Kaka'ako are adjoined venues that provide a space for social interactions and creative collaboration primarily within the arts community. The Fresh Cafe is principally a café that sells local and/or healthy fare, coffee, tea, juices, and smoothies, but its main allure is that it has become a hub for creative minds in Kaka'ako. The creators of Fresh Cafe eventually expanded the venue for these meetings-of-the-minds, opening the Loft in Space, a renovated warehouse loft at the rear of Fresh Cafe to host art exhibits, workshops, and performances.

Community Consultation: Mr. Jasper Wong - Fresh Cafe and Loft in Space

Jasper Wong, Co-owner of Fresh Cafe and Loft in Space, provided details of the joint venues through email communications and online questionnaire in August 2013.

According to Mr. Wong, Tiffany Tanaka, Founder of Fresh Cafe and Loft in Space, saw a need for a cafe/venue space in Kaka'ako for the arts. Mr. Wong partnered with Ms. Tanaka to open the creative arts center in July of 2009 (J. Wong 2013c). As stated by the Fresh Cafe website, "Fresh Cafe was born into the hip and up and coming industrial district of Kaka'ako. [Fresh Cafe is a] hidden oasis with an eclectic mix of artists, students, musicians, and entrepreneurs who need to get away from the hustle and bustle of the city" (Fresh Cafe 2013). Further, the website holds that The Fresh Cafe mission is as follows:

> …to provide a unique gathering space for the community by offering healthy food choices and showcasing both up-and-coming and major talent in music, art, and cuisine. We strive to promote creativity, sustainability, local business, and Fresh ideas. We are here for the next-level dreamers, fearless innovators, and dedicated visionaries. We dare to inspire and be inspired (Fresh Cafe 2013).

Thus, the Fresh Cafe is not only one of the few locations where the community of Kaka'ako can purchase local and/or healthy foods and beverages, it functions for many as a refuge from the stress of city life as well as a sharing and collaboration space for various forms of art being

produced locally. The mission of Loft in Space is to be a "community space supporting the visual arts, music, and education on an international and local scale," which is "…dedicated to the cultural enrichment of the community…" (Loft in Space 2013). To do so, exhibitions, outreach, and related educational programs are held at the Loft in Space monthly. Therefore, the Loft in Space shares the same values as Fresh Cafe, but is an open, food free space to accommodate large gatherings and exhibits centered on the arts. While the Fresh Cafe and Loft in Space are open to all ages, regular customers and participants tend to range from teenagers and thirty-somethings (J. Wong 2013c).

Mr. Wong had a positive outlook on how the proposed Kakaʻako TOD Overlay will affect the Fresh Cafe and Loft in Space, stating: "Hopefully it brings more patrons to the cafe and events held at the space" (J. Wong 2013c).

5.6.4 Vacant Lots & Thoroughfares

Numerous properties within the Kakaʻako TOD Overlay project area have become regular outdoor venues where culturally significant events take place regularly. Table 20 lists the events, the locations, the frequency of the events, and the cultural groups they serve.

Table 20. Events Regularly Occurring in Vacant Lots & Thoroughfares

Event	Location	Frequency	Cultural Group/group
Art & Flea	831 Queen St.	Modern-ongoing, Monthly, 4th Thursdays	Contemporary/Urban Arts (visual, musical, fashion, & food) communities & enthusiasts; community members (no specific ethnic group); local commercial groups; patrons (tourist & residents)
Eat the Street	555 South St.	Modern-ongoing: Monthly	Culinary arts & music communities & enthusiasts; community members (no specific ethnic group); patrons (tourist & residents)
Honolulu Night Market	683 Auahi St.	Modern-ongoing: Monthly	Arts/music, fashion, & food communities & enthusiasts; community members (no specific ethnic group); patrons (tourist & residents)
Honolulu 5K and 1 Mile Keiki Run/Walk	S. Beretania St. to S. King St.	Modern-ongoing: Annual	Running community; community members (no specific ethnic group); spectators (tourist & residents)
King Kamehameha Floral Parade	From corner of King St. & Richards St. to Kapiolani Park	1916-present; Annual (2 days in June)	Parade participants; Hawaiian community; community members (no specific ethnic groups); commercial groups; patrons, & spectators (tourist & residents)
Pow!Wow! Hawaiʻi	Various locations in Kakaʻako Mauka and Makai	Modern-ongoing: Annual (2 days in February)	Contemporary urban & music/arts community; community members (no specific ethnic group); patrons, & spectators (tourist & residents)
Three Walls Music Festival	311 Keawe St.	Modern-ongoing: Annual (2 days in May)	Contemporary & urban music/arts community; community members (no specific ethnic group); tourist & local spectators/patrons

6.0 SUMMARY AND RECOMMENDATIONS

In the Final Environmental Impact Statement Preparation Notice (EISPN) for the Kakaʻako Transit Oriented Development (TOD) Overlay, Sichter (2012) states, "…persons most impacted by the Proposed Action will be existing and future residents of the district, together with all commuters who will pass through the district by car, bus, light rail, bicycle, or as pedestrians." (Sichter 2012:3). This Supplemental Cultural Impact Assessment (SCIA) prepared for the Kakaʻako TOD Overlay focuses on cultural resources in Kakaʻako that are utilized by the above mentioned persons and identified cultural groups.

To be inclusive of all cultural groups, including "Native Hawaiians, other ethnic groups, and other groups" (OEQC 1997: 3-4), and to address areas not previously assessed, this SCIA has added over thirty new cultural resources to the existing record of cultural resources for Kakaʻako. The existing record of cultural resources is based upon five Cultural Impact Assessments (CIA), two Ethno-Historical Inventory studies, and a Traditional Cultural Property (TCP) study that have been performed in the Kakaʻako area (UH 1978; Wilson Okamoto and Associates, Inc. 2002; McElroy et al. 2008; Spearing et al. 2008; Vogeler et al. 2010; Genz & Hammatt 2010; Elison and McElroy 2011; Maly et al. 2013).

A total of 34 cultural resources consisting of Historic Places and Landmarks (n=8), Cultural Learning Facilities (n=7), Public Parks and Grounds (n=7), Memorials and Commemorations (n=4), Religious and Spiritual Gathering Places (n=4), and Public Art Installation and Entertainment Centers (n=4) were identified in this SCIA (Table 16). A significant number of cultural resources (n=21) were identified as occurring within the project area and numerous resources occurring in areas adjacent to project area (n=13).

6.1 Historic Places and Landmarks

A total of eight Historic Places and Landmarks have been identified that were not previously identified in CIAs performed in the area, consisting of the following seven Historic properties located within or adjacent to the project area: Kawaiahaʻo Church, Hawaiian Mission Houses, Kapuāiwa Building, Hawaiʻi State Library, Honolulu Hale, Honolulu Hale Annex, State (Territorial) Office, Hawaiian Electric Company (HECO) Downtown Plant, Aloha Tower, *Falls of Clyde*, Mabel Smyth Memorial Building, Post Office, Customhouse, and Courthouse Building (King David Kalākaua Building), Dillingham Transportation Building, and U.S. Immigration Office.

The Hawaiian Capitol Historic District, which contains Kawaiahaʻo Church, Hawaiian Mission Houses, Kapuāiwa Building, Hawaiʻi State Library, Honolulu Hale, Honolulu Hale Annex, State (Territorial) Office, is currently active on the NRHP and State Register of Historic Places (NRHP Reference No. 78001020; State Site No. 80-14-1321); thus, protected by state and federal laws. Located within the project area are Kawaiahaʻo Church and Hawaiian Mission Houses, both of which have historic and contemporary cultural significance. In the case of Kawaiahaʻo Church, cultural practices, such as regular church service, visitation of the cemetery, and

ceremonial events continue to be important to the Island-wide community. The Hawaiian Mission Houses are repositories and active interpretive centers that continue to serve the community as well. While the Hawai‘i State Library, Honolulu Hale, and Honolulu Hale Annex are located outside of the project area, they are important institutions that have been serving the community for over a century. The Kapuāiwa Building and State (Territorial) Office are less important in terms of significant cultural usage in the modern era. As these properties are already protected by state and federal law, no impact is expected from the Kaka‘ako TOD Overlay. However, visual impacts from encroaching skyscrapers may occur if a sensible distance is not kept from these properties. In addition, access and parking is still an important necessity for the properties that carry contemporary cultural significance, such as Kawaiaha‘o Church, Hawaiian Mission Houses, Hawai‘i State Library, Honolulu Hale, and Honolulu Hale Annex. Reduction of public parking may be a resultant impact from Kaka‘ako TOD Overlay developments. It is recommended that parking and accessibility to these properties is not reduced in project related developments.

The 1929 Hawaiian Electric Company (HECO) Downtown Plant is located in the project area and is not yet recognized by the State of Hawai‘i or NRHP as a Historic site although it likely is eligible based on its antiquity, architecture, and historic significance. However, there were no signs of contemporarycultural utilization of the property and, therefore, no foreseen impacts as a result of the proposed action. It is recommended that the building be protected until the proper authorities evaluate its significance and submit a nomination form to NRHP and/or State Register of Historic Places.

The Aloha Tower, which continues to be an icon for the State of Hawai‘i, is adjacent to the Hawaiian Electric (HECO) Downtown Plant portion of the project area. Due to its cultural and Historic significance, it has been recognized by its NRHP and State Register of Historic Places status (State Site No. 80-14-9929 and NRHP Reference No. 76000660) for over thirty years. Potential impacts to this property may come in the form of visual impacts from increasing build up heights for properties located adjacent or near to the Aloha Tower. Current cultural usage consists of visitation of the interpretive displays within the structure, use of the observation deck located at the top floor of the structure, as well as a variety of commercial activities that occur in the surrounding Aloha Tower Market Place. Parking and access is also important to maintain. It is recommended that parking and accessibility to these properties is not reduced in future developments.

The *Falls of Clyde* is currently moored in waters adjacent to the Hawaiian Electric (HECO) Downtown Plant portion of the project area as well. The vessel is also registered under the NRHP (Reference No. 73000659) and State Register of Historic Places (Site No. 80-14-9700). While the vessel is under major repairs, thus not accessible to the public, it remains a significant nautical attraction on the coastal landscape. No impacts to the *Falls of Clyde* by the proposed action are foreseen. In the event that the vessel is fit for boarding by the public in an interpretive context, access and public parking should fit the demand of visitors.

Located in the southwest corner of the project area is the Mabel Smyth Memorial Building, which is currently registered with NRHP and State Register of Historic Places (Reference No. 93001558; State Site No. 80-14-9765). Yet, this structure has not been identified as a cultural

resource in previous CIAs. As the building is already recognized by state and federal law, no project related impacts are foreseen for the structure.

The Post Office, Customhouse, and Courthouse Building (King David Kalākaua Building), Dillingham Transportation Building, and U.S. Immigration Office are properties with NRHP and State Register of Historic Places status and are adjacent to the project area. These properties have not been identified in previous CIA. However, no potential impacts caused by the project are foreseen.

6.2 Cultural Learning Facilities

A total of seven cultural learning facilities were identified within the Kaka‘ako TOD Overlay project area, consisting of the African American Diversity Cultural Center of Hawai‘i (AADCCH), Diverse Art Center, Hawai‘i Children’s Center, Maritime Museum, and Nā Mea/Native Books Hawai‘i. Each learning facility is a unique cultural resource for the community of Kaka‘ako and the island-wide community.

The African American Diversity Cultural Center of Hawai‘i (AADCCH) is a one-of-a-kind repository of archival documents, researched data, and artifacts pertaining to Africans and African Americans in Hawai‘i’s History. In addition, the facility is a location in which knowledgeable individuals can be accessed for guidance on the subject. The AADCCH is a Non-Profit that currently rents a humble office space for its growing collection, which leaves little room for visitors. While the AADCCH hopes to expand, the rising cost of rent in Kaka‘ako may be a huge obstacle in meeting their goal. Therefore, potential impacts from the project are increased lease fees. It is recommended that the topic of impacts to contemporary cultural resources, such as AADCCH, be addressed in upcoming community discussions regarding the Kaka‘ako TOD Overlay project. One mitigation measure may be to encourage leasors to offer adjusted rent spaces for this and comparable institutions.

Similarly, the Home of the Brave Tour and museum is an irreplaceable cultural learning facility. This World War II repository has an extensive collection of artifacts and replicas as well as oral histories of the amazing personal experiences relayed to the tour operators by the WWII veterans themselves. As we are losing our WWII veterans at an increasing rate due to “old age,” Home of the Brave Tour and museum is a vital cultural resource. Unlike other cultural learning facilities, this facility is dependent on the structure that it is currently housed, due to twenty years of painstaking modifications to create and incorporate interpretive displays in to the structure. Impacts to the cultural resource would be loss of the current space it is housed in. Community discussions for the Kaka‘ako TOD Overlay should involve the topic of impacts to contemporary cultural resources, such as the Home of the Brave Tour and museum, which could bolster support for this valuable institution. It is recommended that project relateed developments work around the structure and leasors be encouraged to offer adjusted rent spaces for this and comparable institutions.

Diverse Art Center and The Refuge, run by 808 Urban, are unique urban and street art cultural learning facilities that services the youth and young adults of Kaka‘ako and surrounding areas. These organizations are also Non-Profits that provide a safe space for creating art and access to

artists for mentorship. The major foreseeable impact to these institutions is loss of leased space in Kakaʻako due to increased rent from project related developments. The recommendation is to address the topic of impacts to cultural resources like these during Kakaʻako TOD Overlay community discussions to increase awareness of resources of this nature as important features of Kakaʻako's cultural landscape. One mitigation measure may be to encourage leasors to offer adjusted rent spaces for these and similar institutions.

The Hawaiʻi Children's Center is also an important cultural resource that helps inner city children and children island-wide to interact with other children while interfacing with educational exhibits. Unlike school, this resource is not regimented and allows the parents to participate in the child's experience. One impact would be loss of leased space due to increased rents. Again, the recommended action is to incorporate the subject of contemporary cultural resources in upcoming Kakaʻako TOD Overlay community discussions, which could bolster support for this valuable institution.

The Maritime Museum was an operable museum until recent years, closing in 2009. As the former museum is not planned to be re-opened in the near future, it is not possible to determine if it will be impacted by the proposed development.

Nā Mea/Native Books Hawaiʻi is another unique cultural resource in Kakaʻako that retails an array of Hawaiiana books and music, arts and crafts, and raw materials to create Traditional Hawaiian crafts. It also hosts free workshops and lectures almost daily in Hawaiian traditions, such as storytelling, music making, *hula*, *lei* making, quilting, etc. Access to *kūpuna* such as those who specialize in various traditional crafts and knowledge is rarely available otherwise. Thus, Nā Mea/Native Books Hawaiʻi should be recognized as a contemporary cultural resource. Potential impacts include increased rents that could force the institution out of Kakaʻako. However, population increases due to project related development might increase store visitation and revenue. One mitigative measure may be to encourage leasors to offer adjusted rent spaces for this and comparable institutions during Kakaʻako TOD Overlay community discussions.

6.3 Public Parks and Grounds

Seven public parks and grounds have been identified in or adjacent to the project area, including Kakaʻako Waterfront Park, Kewalo Basin Park, Kakaʻako Makai Gateway Park, Mother Waldron Park/Playground, Ala Moana Beach Park, Irwin Park, and Thomas Square. Kakaʻako Waterfront Park, Kewalo Basin Park, Kakaʻako Makai Gateway Park, and Mother Waldron Neighborhood Park are located in the Kakaʻako TOD Overlay project area. Ala Moana Beach Park, Irwin Park, and Thomas Square are adjacent to the project area. By design, public open space parks and grounds are cultural resources and vital elements to the community, especially in urban settings.

All identified parks have individual characteristics, providing a particular physical attribute suitable for various specialized activities. A host of activities and events occur at these parks randomly, daily, weekly, monthly, and annually, and range from casual, random visitations to grand events attracting participants from all corners of the island. The general consensus from

community consultations is that these spaces are irreplaceable and dear to the community. As mentioned by CPAC Secretary and Archivist, Michelle Matson, in an email communication,

community leaders and development planners should be mindful that the community deserves the following:

- maintaining and increasing open park space
- maintaining open public access to our established ocean recreational areas
- mitigating problems from adverse overcrowding and over-development impacts on cultural and recreational shoreline park uses
- addressing ocean water quality concerns from storm water runoffs, as such may adversely impact and endanger shoreline recreation uses
- establishing a critical ocean safety and lifeguard facility to ensure effective first-responder and emergency treatment of shoreline park water users

She maintains, "…with all of the above being needed and necessary to support the present public recreational population of Kakaʻako Makai, as well as recreational needs of the anticipated population increase of 45,000 additional residents in the Kakaʻako area. Notably, our existing parks are at capacity on weekends and during events, and the National Standard for urban recreational open space to ensure the public health and welfare is 2 to 21/2 acres per 1000 capita (45,000 = 90 acres minimum)…" (Matson 2013).

Therefore, it is recommended that any impacts, such as project related development of park space to accommodate any activity other than public recreation be avoided. Access must remain open to the public and parking should be permanent elements of these parks, especially during large-scale events, to ensure accessibility to those coming from outer communities.

6.4 Memorials and Commemorations

A total of four memorials and commemorations have been identified for the project area. These include the Ehime Maru Memorial, MADD Victims' Memorial, Nagasaki Peace Bell, and Florentino Das Commemorative Plaque. Each of these cultural resources provides a unique space to remember and honor cherished individuals, victims of tragic events, and/or history makers. All memorials and commemorations are located in the project area, save for the Nagasaki Peace Bell.

Each memorial and commemoration appears actively used or visited by the community and should therefore be preserved in place. Potential impacts would be the removal of these cultural resources or encroachment of objects or structures in the dedicated space around the memorial or commemoration feature. It is recommended that development avoid these spaces.

6.5 Religious and Spiritual Gathering Places

In total, four long-standing churches in or adjacent to the project area have been identified, including the First Chinese Church of Christ, Kawaiahaʻo Church, Ke Alaula Oka Malamalama (The Bright Morning Rays of the Church of Reasonable Service), and Makiki Christian Church.

Each church actively serves the community by providing a distinctive type of ceremonial and religious service, such as sermons in languages spoke in the respective community it represents. In addition, these intuitions are largely housed in Historic era structures that are eligible if not already listed in the NRHP and State Register of Historic Places. Impacts could be decreased access due to lack of parking. It is recommended that these properties be avoided in project related development.

6.6 Public Art Installation & Entertainment Centers

A total of four public art installation and entertainment centers were identified in this study, including POW! WOW!, Neal S. Blaisdell Concert and Exhibition Complex, FreshCafe & Loft in Space, and various vacant lots & thoroughfares. All of these cultural resources are located within the project area.

POW!WOW! is actually an annual weeklong event that showcases an array of large urban or street art murals installed throughout Kakaʻako. These murals are significant resources for the arts community as well as the general public who view these murals. The event also provides the opportunity for artists to interact and learn from other artists from around the globe. Potential impacts to this newer institution could be the loss of space for murals due to project related development. It is recommended that the topic of sanctioned public art, such as the art installed during the POW!WOW! events be addressed in upcoming Kakaʻako TOD Overlay community discussions to ascertain the importance of these cultural resources to the community.

The Neal S. Blaisdell Concert and Exhibition Complex is the main venue on Oʻahu for large-scale performances and exhibitions. This irreplaceable resource has been the home of nurmerous cultural events throughout its history and will be eligible for NRHP and State Register of Historic Places status in the near future. Impacts may include reduced access due to project related development. It is advised that this important cultural resource be avoided by development that is not supportive of arts and entertainment.

The Fresh Cafe & Loft in Space has become an important venue for up-and-coming artists and aspiring artists of all genres. This space allows artists to collaborate, present art, sell arts and crafts, lecture, learn, and debate all aspects of contemporary art. This creative space/artist think tank could be impacted by raised rent and reduced parking availability due to project related developments. Introducing the topic of project related impacts to contemporary cultural resources is recommended during upcoming Kakaʻako TOD Overlay community discussions. One mitigation measure may be to encourage leasors to offer adjusted rent spaces for these and similar institutions.

In addition to formal or dedicated areas for cultural activities, there are several vacant lots and thoroughfares that are venues for regular cultural events, perhaps unique to Kakaʻako, such as Art & Flea, Eat the Street, Honolulu Night Market, Honolulu 5K and 1 Mile Keiki Run/Walk, King Kamehameha Floral Parade, Pow!Wow! Hawaiʻi, and Three Walls Music Festival. These events are not dependent on the particular space that they occur on – they simply need open venues. However, these events have become part of the charm and attraction to the area. The

main impact to these activities would be loss of space. Addressing the topic of contemporary cultural practices, such as the afore mentioned, as important facets of Kakaʻako's cultural landscape and how they might be impacted by the proposed action during upcoming community discussions is recommended.

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APPENDIX A

Guidelines for Assessing Cultural Impacts
(Office of Environmental Quality Control 1997)
And
Text of Act 50
(State Legislature Hawai'i 2000)

Guidelines for Assessing Cultural Impacts

Adopted by the Environmental Council, State of Hawaii
November 19, 1997

1. INTRODUCTION

It is the policy of the State of Hawaii under Chapter 343, HRS, to alert decision makers, through the environmental assessment process, about significant environmental effects which may result from the implementation of certain actions. An environmental assessment of cultural impacts gathers information about cultural practices and cultural features that may be affected by actions subject to Chapter 343, and promotes responsible decision making.

Articles IX and XII of the State Constitution, other state laws, and the courts of the state require government agencies to promote and preserve cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups. Chapter 343 also requires environmental assessment of cultural resources, in determining the significance of a proposed project.

The Environmental Council encourages preparers of environmental assessments and environmental impact statements to analyze the impact of a proposed action on cultural practices and features associated with the project area. The Council provides the following methodology and content protocol as guidance for any assessment of a project that may significantly affect cultural resources.

Background

Prior to the arrival of westerners and the ideas of private land ownership, Hawaiians freely accessed and gathered resources of the land and seas to fulfill their community responsibilities. During the Mahele of 1848, large tracts of land were divided and control was given to private individuals. When King Kamehameha the III was forced to set up this new system of land ownership, he reserved the right of access to privately owned lands for Native Hawaiian ahupua'a tenants. However, with the later emergence of the western concept of land ownership, many Hawaiians were denied access to previously available traditional resources.

In 1978, the Hawaii constitution was amended to protect and preserve traditional and customary rights of Native Hawaiians. Then in 1995 the Hawaii Supreme Court confirmed that Native Hawaiians have rights to access undeveloped and under-developed private lands. Recently, state lawmakers clarified that government agencies and private developers must assess the impacts of their development on the traditional practices of Native Hawaiians as well as the cultural resources of all people of Hawaii. These Hawaii laws, and the National Historic Preservation Act, clearly mandate federal agencies in Hawaii, including the military, to evaluate the impacts of their actions on traditional practices and cultural resources.

If you own or control undeveloped or under-developed lands in Hawaii, here are some hints as to whether traditional practices are occurring or may have occurred on your lands. If there is a trail on your property, that may be an indication of traditional practices or customary usage. Other clues include streams, caves and native plants. Another important point to remember is that, although traditional practices may have been interrupted for many years, these customary practices cannot be denied in the future.

These traditional practices of Native Hawaiians were primarily for subsistence, medicinal, religious, and cultural purposes. Examples of traditional subsistence practices include fishing, picking opihi and collecting limu or seaweed. The collection of herbs to cure the sick is an example of a traditional medicinal practice. The underlying purpose for conducting these traditional practices is to fulfill one's community responsibilities, such as feeding people or healing the sick.

As it is the responsibility of Native Hawaiians to conduct these traditional practices, government agencies and private developers also have a responsibility to follow the law and assess the impacts of their actions on traditional and cultural resources.

The State Environmental Council has prepared guidelines for assessing cultural resources and has compiled a directory of cultural consultants who can conduct such studies. The State Historic Preservation Division has drafted guidelines on how to conduct ethnographic inventory surveys. And the Office of Planning has recently completed a case study on traditional gathering rights on Kaua'i.

The most important element of preparing Cultural Impact Assessments is consulting with community groups, especially with expert and responsible cultural practioners within the ahupua'a of the project site. Conducting the appropriate documentary research should then follow the interviews with the experts. Documentary research should include analysis of mahele and land records and review of transcripts of previous ethnographic interviews. Once all the information has been collected, and verified by the community experts, the assessment can then be used to protect and preserve these valuable traditional practices.

Native Hawaiians performed these traditional and customary practices out of a sense of responsibility: to feed their families, cure the sick, nurture the land, and honor their ancestors. As stewards of this sacred land, we too have a responsibility to preserve, protect and restore these cultural resources for future generations.

TEXT OF ACT 50, SLH 2000

A BILL FOR AN ACT RELATING TO ENVIRONMENTAL IMPACT STATEMENTS

UNOFFICIAL VERSION

HOUSE OF REPRESENTATIVES H.B. NO, 2895 H.D.1

TWENTIETH LEGISLATURE, 2000

STATE OF HAWAII

A BILL FOR AN ACT

RELATING TO ENVIRONMENTAL IMPACT STATEMENTS.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

SECTION 1. The legislature finds that there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai'i's culture, and traditional and customary rights.

The legislature also finds that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the "aloha spirit' in Hawaii. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.

Moreover, the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture. The legislature further finds that due consideration of the effects of human activities on native Hawaiian culture and the exercise thereof is necessary to ensure the continued existence, development, and exercise of native Hawaiian culture.

The purpose of this Act is to: (1) Require that environmental impact statements include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amend the definition of "significant effect" to include adverse effects on cultural practices.

SECTION 2. Section 343-2, Hawai`i Revised Statutes, is amended by amending the definitions of "environmental impact statement' or "statement" and "significant effect", to read as follows:

"'Environmental impact statement" or "statement" means an informational document prepared in compliance with the rules adopted under section 343-6 and which discloses the environmental effects of a proposed action, effects of a proposed action on the economic [and] welfare, social welfare, and cultural practices of the community and State, effects of the economic activities arising out of the proposed action, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects.

The initial statement filed for public review shall be referred to as the draft statement and shall be distinguished from the final statement which is the document that has incorporated the public's comments and the responses to those comments. The final statement is the document that shall be evaluated for acceptability by the respective accepting authority.

"Significant effect" means the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource, curtail the range of beneficial uses of the environment, are contrary to the State's environmental policies or long-term environmental goals as established by law, or adversely affect the economic [or] welfare, social welfare[.], or cultural practices of the community and State."

SECTION 3. Statutory material to be repealed is bracketed. New statutory material is underscored.

SECTION 4. This Act shall take effect upon its approval.

Approved by the Governor as Act 50 on April 26, 2000

2. CULTURAL IMPACT ASSESSMENT METHODOLOGY

Cultural impacts differ from other types of impacts assessed in environmental assessments or environmental impact statements. A cultural impact assessment includes information relating to the practices and beliefs of a particular cultural or ethnic group or groups.

Such information may be obtained through scoping, community meetings, ethnographic interviews and oral histories. Information provided by knowledgeable informants, including traditional cultural practitioners, can be applied to the analysis of cultural impacts in conjunction with information concerning cultural practices and features obtained through consultation and from documentary research.

In scoping the cultural portion of an environmental assessment, the geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment. Thus, for example, a proposed action that may not physically alter gathering practices, but may affect access to gathering areas would be included in the assessment. An ahupua'a is usually the appropriate geographical unit to begin an assessment of cultural impacts of a proposed action, particularly if it includes all of the types of cultural practices associated with the project area. In some cases, cultural practices are likely to extend beyond the ahupua'a and the geographical extent of the study area should take into account those cultural practices.

The historical period studied in a cultural impact assessment should commence with the initial presence in the area of the particular group whose cultural practices and features are being assessed. The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs.

The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural, including submerged cultural resources, which support such cultural practices and beliefs.

The Environmental Council recommends that preparers of assessments analyzing cultural impacts adopt the following protocol:

1. identify and consult with individuals and organizations with expertise concerning the types of cultural resources, practices and beliefs found within the broad geographical area, e.g., district or ahupua`a;
2. identify and consult with individuals and organizations with knowledge of the area potentially affected by the proposed action;
3. receive information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area;
4. conduct ethnographic, historical, anthropological, sociological, and other culturally related documentary research;
5. identify and describe the cultural resources, practices and beliefs located within the potentially affected area; and
6. assess the impact of the proposed action, alternatives to the proposed action, and mitigation measures, on the cultural resources, practices and beliefs identified.

Interviews and oral histories with knowledgeable individuals may be recorded, if consent is given, and field visits by preparers accompanied by informants are encouraged. Persons interviewed should be afforded an opportunity to review the record of the interview, and consent to publish the record should be obtained whenever possible. For example, the precise location of human burials are likely to be withheld from a cultural impact assessment, but it is important that the document identify the impact a project would have on the burials. At times an informant may provide information only on the condition that it remain in confidence. The wishes of the informant should be respected.

Primary source materials reviewed and analyzed may include, as appropriate: Mahele, land court, census and tax records, including testimonies; vital statistics records; family histories and genealogies; previously published or recorded ethnographic interviews and oral histories; community studies, old maps and photographs; and other archival documents, including correspondence, newspaper or almanac articles, and visitor journals. Secondary source materials such as historical, sociological, and anthropological texts, manuscripts, and similar materials, published and unpublished, should also be consulted. Other materials which should be examined include prior land use proposals, decisions, and rulings which pertain to the study area.

3. CULTURAL IMPACT ASSESSMENT CONTENTS

In addition to the content requirements for environmental assessments and environmental impact statements, which are set out in HAR §§ 11-200-10 and 16 through 18, the portion of the assessment concerning cultural impacts should address, but not necessarily be limited to, the following matters:

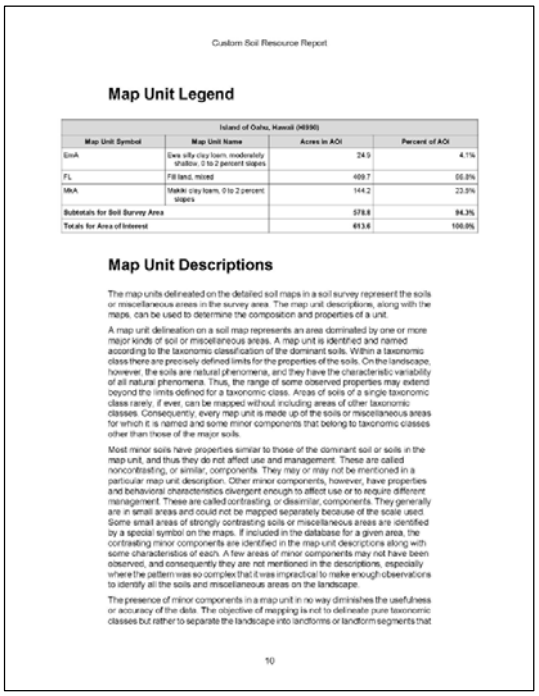
1. A discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations which might have affected the quality of the information obtained.
2. A description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken.
3. Ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained.
4. Biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area.
5. A discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken. This discussion should include, if appropriate, the particular perspective of the authors, any opposing views, and any other relevant constraints, limitations or biases.
6. A discussion concerning the cultural resources, practices and beliefs identified, and, for resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site.
7. A discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project.

8. An explanation of confidential information that has been withheld from public disclosure in the assessment.
9. A discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs.
10. An analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.
11. A bibliography of references, and attached records of interviews which were allowed to be disclosed.

The inclusion of this information will help make environmental assessments and environmental impact statements complete and meet the requirements of Chapter 343, HRS. If you have any questions, please call 586-4185.

APPENDIX B

Selected data from NRCS Customized Soil Reports for Contiguous and Non-contiguous
Kaka'ako TOD Overlay Project Area
(Full reports available upon request)



Custom Soil Resource Report

Map Unit Legend

Island of Oahu, Hawaii (H990)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
EmA	Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes	24.9	4.1%
FL	Fill land, mixed	409.7	66.8%
MkA	Makiki clay loam, 0 to 2 percent slopes	144.2	23.5%
Subtotals for Soil Survey Area		578.8	94.3%
Totals for Area of Interest		613.6	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that

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Custom Soil Resource Report

have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

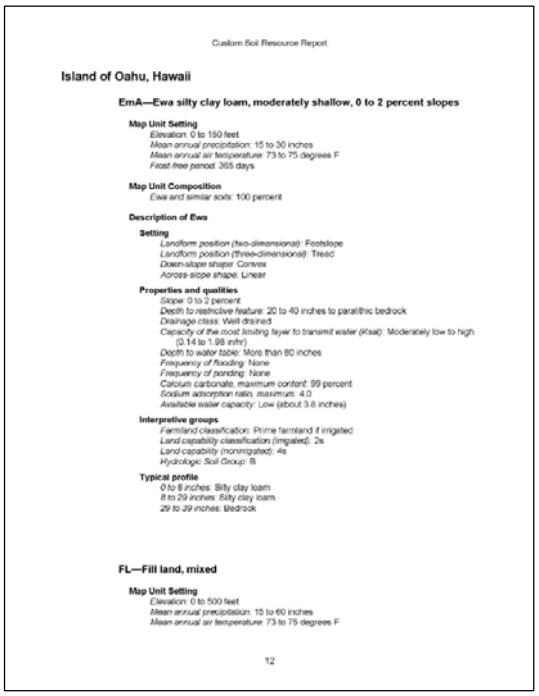
A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

11



Custom Soil Resource Report

Island of Oahu, Hawaii

EmA—Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes

Map Unit Setting
Elevation: 0 to 150 feet
Mean annual precipitation: 15 to 30 inches
Mean annual air temperature: 73 to 75 degrees F
Frost-free period: 365 days

Map Unit Composition
Ewa and similar soils: 100 percent

Description of Ewa

Setting
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 99 percent
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Low (about 3.8 inches)

Interpretive groups
Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 2s
Land capability (nonirrigated): 4s
Hydrologic Soil Group: B

Typical profile
0 to 8 inches: Silty clay loam
8 to 29 inches: Silty clay loam
29 to 29 inches: Bedrock

FL—Fill land, mixed

Map Unit Setting
Elevation: 0 to 500 feet
Mean annual precipitation: 15 to 60 inches
Mean annual air temperature: 73 to 75 degrees F

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Frost-free period: 365 days

Map Unit Composition
Fill land, mixed, mixed, and similar soils: 100 percent

Description of Fill Land, Mixed, Mixed

Setting
Landform: Flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fill land

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 100 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water capacity: Low (about 5.4 inches)

Typical profile
0 to 6 inches: Gravelly sandy loam
6 to 50 inches: Fine sandy loam
60 to 70 inches: Bedrock

MkA—Makiki clay loam, 0 to 2 percent slopes

Map Unit Setting
Elevation: 20 to 200 feet
Mean annual precipitation: 30 to 60 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 365 days

Map Unit Composition
Makiki and similar soils: 100 percent

Description of Makiki

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, rise
Down-slope shape: Linear

Across-slope shape: Concave
Parent material: Alluvium

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.8 inches)

Interpretive groups
Farmland classification: Prime farmland if irrigated
Land capability (nonirrigated): 3c
Hydrologic Soil Group: B

Typical profile
0 to 20 inches: Clay loam
20 to 30 inches: Clay loam
30 to 60 inches: Paragravelly clay loam

Map Unit Legend

Island of Oahu, Hawaii (HI990)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
FL	Fill land, mixed	4.1	100.0%
Totals for Area of Interest		4.1	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are *complexes*, *associations*, or *undifferentiated groups*.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Island of Oahu, Hawaii

FL—Fill land, mixed

Map Unit Setting
Elevation: 0 to 500 feet
Mean annual precipitation: 15 to 60 inches
Mean annual air temperature: 73 to 75 degrees F
Frost-free period: 365 days

Map Unit Composition
Fill land, mixed, mixed, and similar soils: 100 percent

Description of Fill Land, Mixed, Mixed

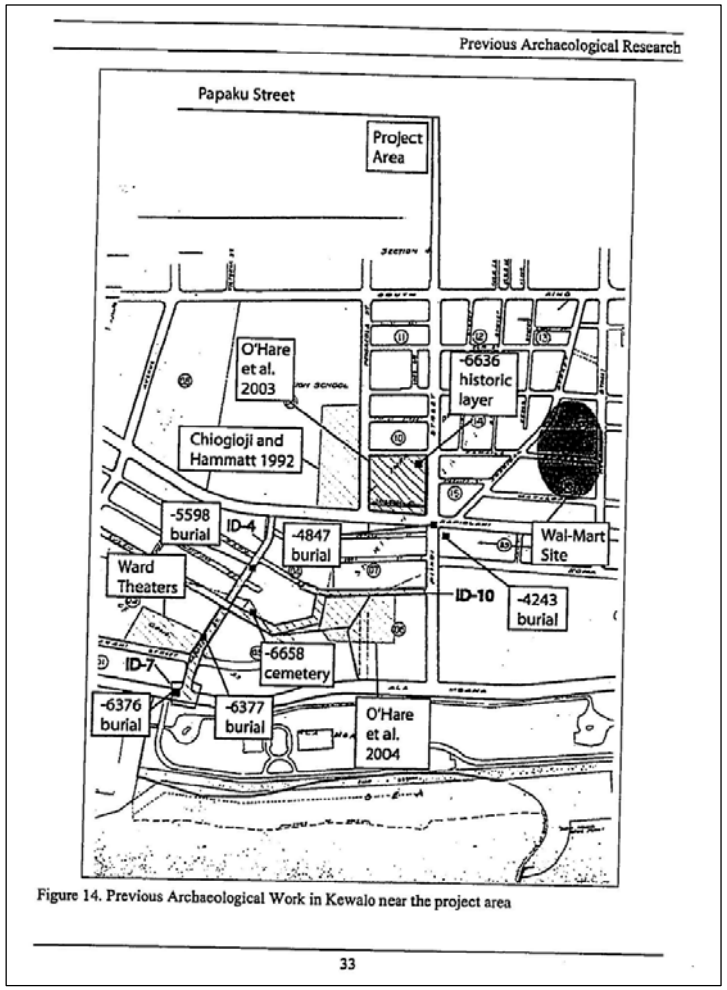
Setting
Landform: Flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fill land

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 100 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water capacity: Low (about 5.4 inches)

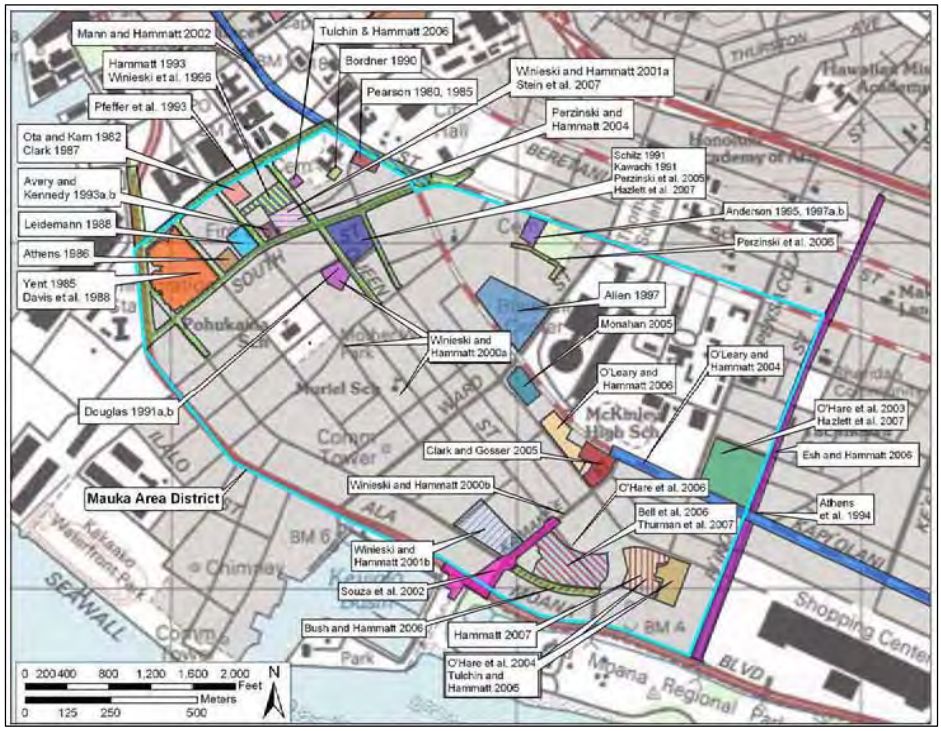
Typical profile
0 to 6 inches: Gravelly sandy loam
6 to 60 inches: Fine sandy loam
60 to 70 inches: Bedrock

APPENDIX C

Maps of Previous Archaeological Investigations (O'Hare and Hammatt 2004; Spearing et al. 2008; Thurman et al. 2010; Hammatt 2013)



Previous Archaeology map from O'Hare and Hammatt (2004:33).



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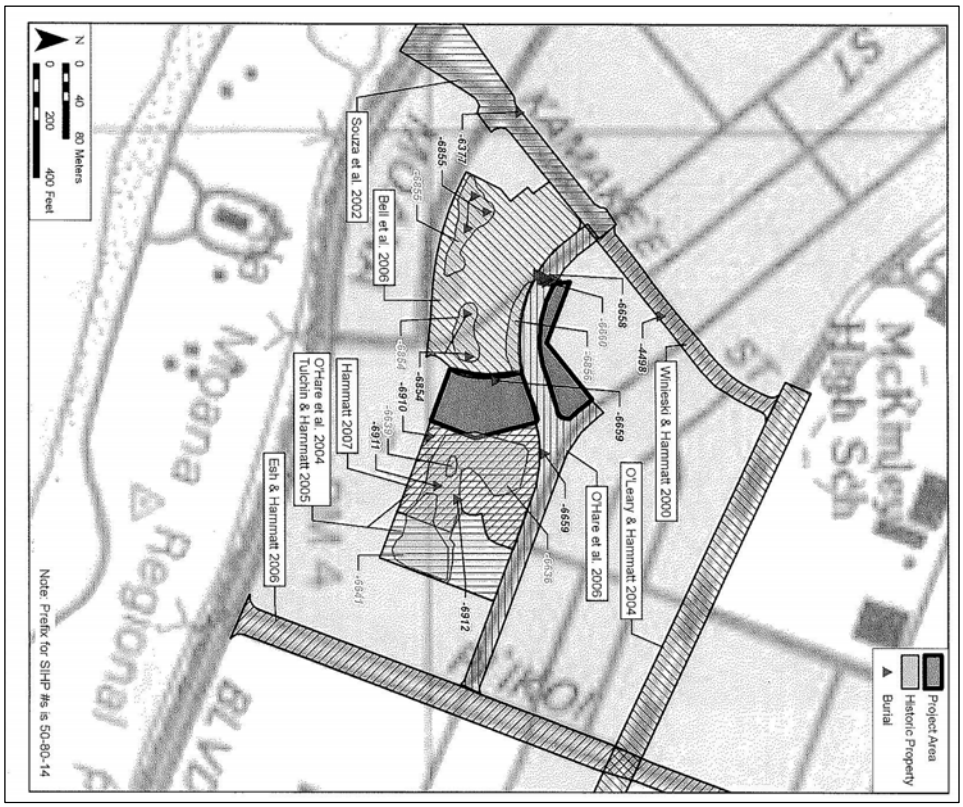

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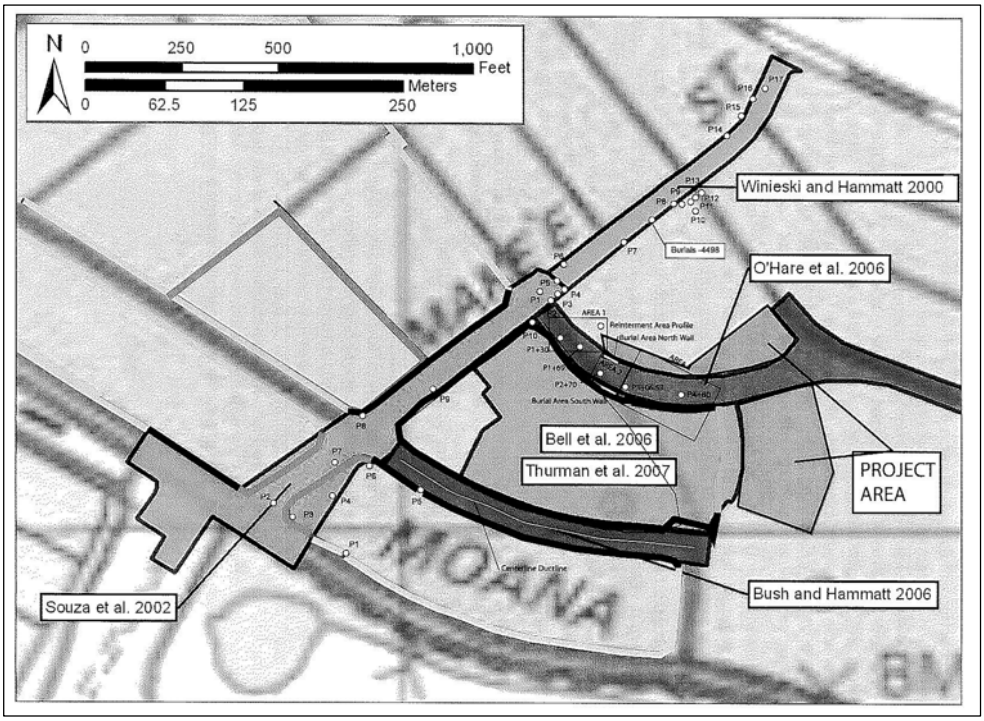
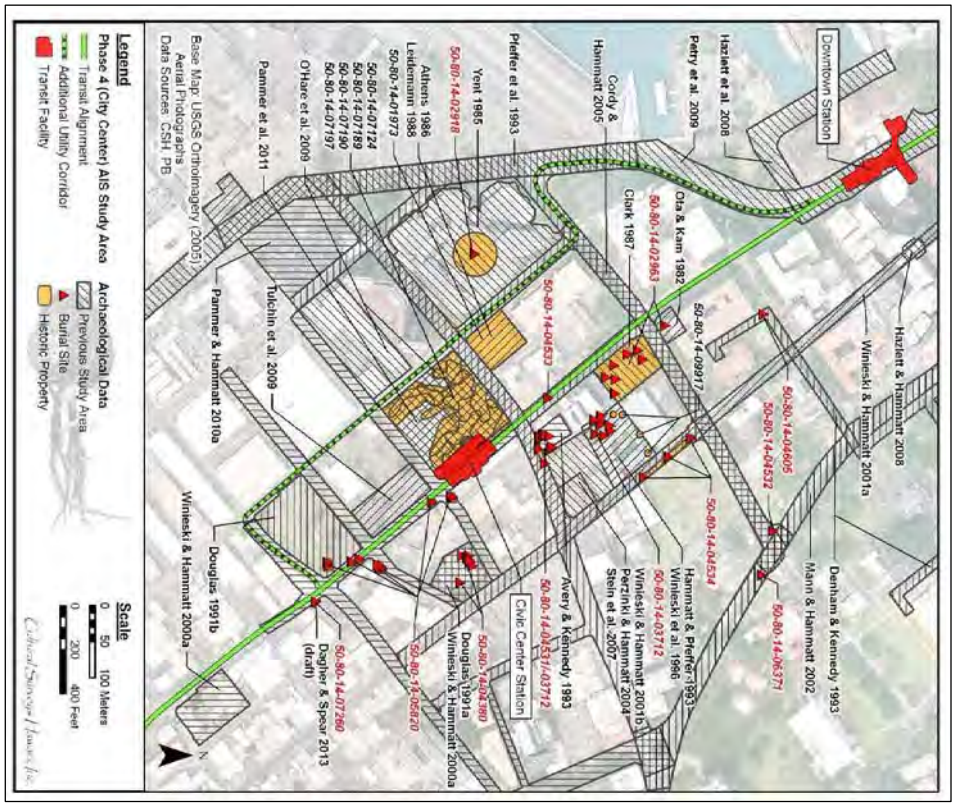
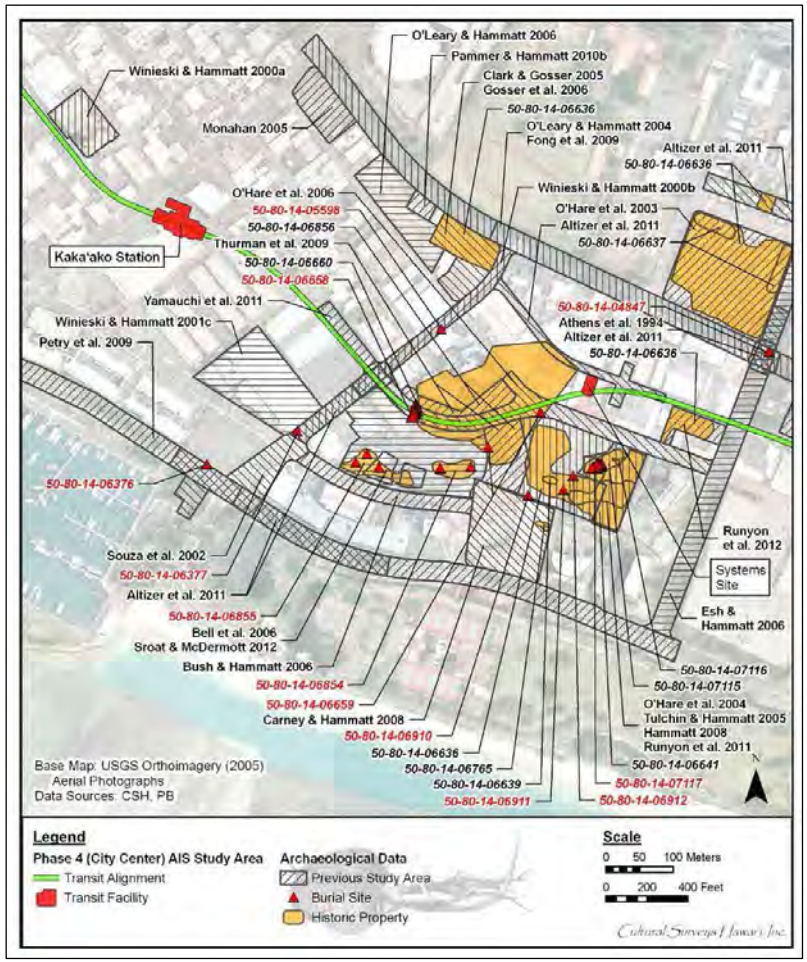


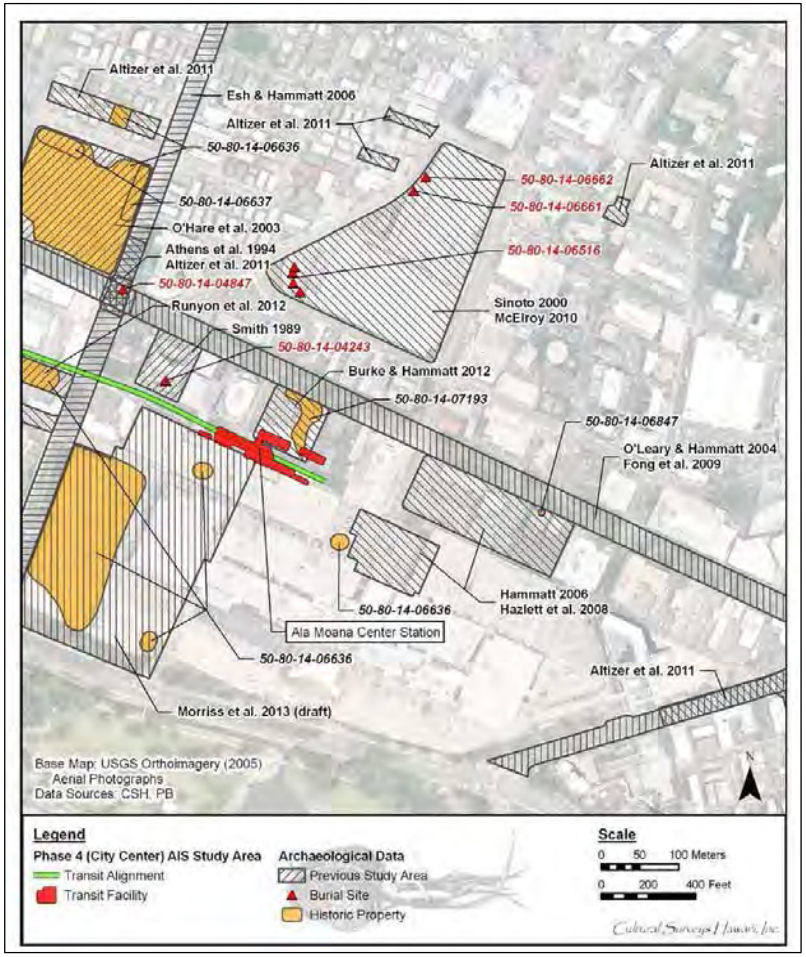
Previous Archaeology map from Thurman et al. (2009:74).



Previous Archaeology map of the HART corridor in northwestern Kaka'ako from Hammatt (2013:146).



Previous Archaeology map of the HART corridor in southeastern Kaka'ako from Hammatt (2013:147).



Previous Archaeology map of the HART corridor in Kālia from Hammatt (2013:147).

APPENDIX D

Contact List/Communication Log

Kakaʻako Transit Oriented Development Supplemental Cultural Impact Assessment - Cultural Informants				
Name	**Affiliation/Association**	**Priority**	**Contact Log**	**Participation**
Abinales, Patricio	UH Manoa, School of Pacific and Asian Studies, Re: Florentino Das Memorial	Medium	7/25/13 sent email request; 7/25/13 Mr. Abinales replies via email, refers me to COVO	**Refers COVO**
Ala Moana Center	In project area	High	8/6/13 send request email to Ala Moana Center website; no response	**None**
Aloha Festivals	Several events in and adjacent to project area	High	7/29/13 sent request email to Aloha Festivals website; 8/13/13 received response from JoAnn Morimoto referring me to Toni Lee (forwards email to Ms. Lee); 8/18/13 Ms. Lee responds via email and agrees to participate; 8/20/13 call Ms. Lee to set up interview; says she would like to do online questionnaire; no record of participation online	**Unable to participate**
Ayau, Edward H.	Interviewed, in Vogeler et al. 2010	Medium	8/5/13 sent request letter	**None**
Ayers, Patrick	German Shepherd Dog Club of Hawaii, president (use Thomas Square Park for shows)	Low	8/13/13-8/15/13 several email communications between Mr. Ayers and myself; 8/13/13 participates in online questionnaire, but withdraws comments via email 8/13/13	**Online Questionnaire**
Bandack, Fred	Hawaiʻi Gateball Association (weekly gateball & groundgolf games @ Ala Moana Park)	Medium	8/12/13 called & spoke with Fred, he said to meet him on Sunday morning for interview; 8/17/13 waited at Ala Moana Park for Fred and he had last minute cancellation; 8/19/13 called Fred and he agreed to participate in online questionnaire	**Unable to participate**
Bishop Museum	Maritime Museum and *Falls of Clyde* management	High	7/25/13: sent request letter; 8/19/13 called, spoke with Carole (Executive offices receptionist) & she asked me to email copy of letter; 8/26/13 got response from Noa Dettweiler with information on the Hawaii Maritime Museum and Falls of Clyde; 8/26/13 responded via email	**Emailed status of properties**
Bowen, Margaret	Aloha State Sporting Dog Assn. (Re: events at Thomas Square Park)	Medium	8/13/13 send request email; 8/13/13 Ms. Bowen responds via email; 8/13/13 Ms. Bowen provides more info via email; 8/13/13 thank Ms. Bowen via email	**Shared info via email**
Colmenares, Dr. Serafin	Congress of Visayan Organizations (COVO), Re: Florentino Das Memorial	High	F. Magdelena referred me to Dr. Colmenares; 7/29/13 sent Dr. Colmenares request email;	**Online Questionnaire**
Crabbe, Kamanaʻopono	Office of Hawaiian Affairs, CEO	High	7/22/13: sent letter to Mr. Crabbe;	**Responds via letter**
Davis, Jeff	Eat the Street and Honolulu Night Market organizer	High	7/24/13: sent email request to Jeff; 7/25/13 Jeff replied and sent request to person in charge with media requests	**Unable to participate**
Dawson, Beadie K.	Cultural practitioner& raised in Kakaʻako; Interviewee (Maly et al. 2013)	Medium	8/7/13 sent letter asking if she was interested in further CIA participation	**None**
Department of Land& Natural Resources	Oversees state parks in Kakaʻako	High	7/23/13 sent letter to both offices to request information	**None**
Dettweiler, Kahikino Noa	Bishop Museum, General Counsel	Low	8/26/13 got response from Noa Dettweiler with information on the Hawaii Maritime Museum and Falls of Clyde; 8/26/13 responded via email	**Information via email**
Dreith, Madeleine	US Tennis Association/ Hawaiʻi Pacific Section, Directory of Community Tennis (Re: Ala Moana Park Tennis Courts)	Low	8/13/13 emailed USTA (3 separate admin.) requesting participation; 8/18/13 submits online questionnaire	**Online questionnaire**
Guttman, Delores	African American Diversity Cultural Center Hawai'i located in Kakaʻako	High	8/6/13 called AADCCH and left request message; 8/9/13 Ms. Guttman calls back, leaves message; 8/9/13 return Ms. Guttman's call, speak with Ms. Guttman, explaining project and settle on a date to interview; 8/22/13 interview Ms. Guttman at AADCCH headquarters	**Interview**

Kakaʻako Transit Oriented Development Supplemental Cultural Impact Assessment - Cultural Informants				
Name	**Affiliation/Association**	**Priority**	**Contact Log**	**Participation**
Gora, Francine	Interviewed, in Elison (2013)	Medium	8/7/13 sent letter asking if she was interested in further CIA participation	**None**
Grace Bible Church Honolulu	In project area	Low	7/23/13: sent request letter	**None**
Fang, Wei	Owner - R&D curated bookstore, coffee shop and workspace in Kakaʻako	Medium	7/24/13 sent email request to "R/D curated bookstore, coffee shop and workspace", 7/25/13 Ms. Fang replies to email requesting more info, reply same day; 7/26/13 Ms. Fang agrees to meet; 8/9/13 offer to meet later in week; 8/12/13 Ms. Fang suggests Thurs 8/15; 8/13/13 set date; 8/15/13 interview at 1pm w/ Ms. Fang; through interview found out R/D would be closing its doors and not reopening due to loss of affordable lease space	**Interview, but found that the resource will not continue into the next year**
Felly, Taryn	General Growth Properties, Kakaʻako	Low	7/25/13 sent request email	**None**
First Chinese Church of Christ	Location adjacent to project area	Medium	7/23/13: sent request letter	**None**
Hanapaʻa Fishing	Fishing & diving tournaments in waters all over the island	Medium	7/24/13: sent request letter	**None**
Haole, Bill	Kawaiahaʻo Church; Interviewed, in Elison & McElroy (2011)		8/7/13 sent letter asking if she was interested in further CIA participation ; 8/26/13 spoke with Bill on phone; said he would be in contact; no response	**Unable to participate**
Hawaiʻi Children's Discovery Center	111 Ohe Street Honolulu, Hawaii 96813 Phone: (808) 524-KIDS (524-5437) Fax: (808) 524-5400 info@discoverycenterhawaii.org	High	7/25/13 sent email request	**None**
Hawaii LGBT Legacy Foundation	Annual Pride Parade begins at Ala Moana Park and Pride Fair takes place at Ala Moana Park	Medium	8/5/13: sent request letter	**None**
Hawaiʻi Philadelphia Mission	In project area	Low	7/23/13: sent request letter	**None**
Hawaiʻi State Library	Location adjacent to project area	Medium	7/25/13: sent request letter	**None**
Hawaiian Civic Club of Honolulu	Location adjacent to project area	Medium	7/23/13: sent request letter	**None**
Hawaiian Mission Houses	In project area	High	7/25/13: sent request letter	**None**
Hawkins, Edward	Japan-America Society of Hawaii & Ehime Maru Memorial Association, President	High	7/25/13: sent request email to admindir@jashawaii.org; 7/25/13 response from Ed Hawkins, Pres. Japan-America Society of HI (several email exchanges); 7/29/13 called Mr. Hawkins and left message; 7/29/13 Mr. Hawkins called and asked to speak later today; 8/5/13 after several email exchanges, Mr. Hawkins submits online questionnaire, I email him to notify it was a success;	**Online Questionnaire**
His Highest Praise Honolulu	In project area	Low	7/23/13: sent request letter	**None**
Ho, Roy	Nā Lei Aloha Foundation, Executive Director (Re: Lantern Floating Ceremony @ Ala Moana Park)	Medium	8/14/13 call & leave message on machine as well as email Mr. Ho;	**Interview**
Holy Theotokos of Iveron Russian Orthodox Church	In project area	Low	7/23/13: sent request letter	**None**

Kakaʻako Transit Oriented Development Supplemental Cultural Impact Assessment - Cultural Informants				
Name	**Affiliation/Association**	**Priority**	**Contact Log**	**Participation**
Inouye, Christine	Obedience Training Club of Hawai`i, President (Re: activities at Thomas Square Park)	Medium	8/14/13 emailed me to agree to participate in online questionnaire; no record of questionnaire submittal	**Unable to participate**
Iwai, Thomas	Friends of Kewalos	High	8/15/13 interview Mr. Iwai with Ron Iwami at Kewalo Basin	**Interview**
Iwami, Ron	Friends of Kewalos	High	7/31/13 Bob Richmond forwarded my request email to Ron; 8/5/13 Ron responds to forwarded email to agree to participate; 8/5/13 I respond to Ron's email and provide him with a link to view the online questionnaire to see what type of information I'm looking for; 8/9/13 email Ron to set a date for interview; 8/15/13 perform joint interview with Ron and Tom Iwai at Kewalo Basin Park	**Interview**
Joyner, Marsha	Martin Luther King, Jr. Holiday Coalition (Re: Nagasaki Peace Bell Ringing ceremony on Honolulu Hale grounds)	Medium	7/29/13 sent email request; 7/29/13 M. Joyner responds to email request, agrees to participate in online questionnaire and sends pdf of information about the Nagasaki Peace Bell; no questionnaire response	**Sent info via email**
Kaanapu, Katie	Ward Centers, The Howard Hughes Corporation, Senior Marketing Manager (Re: Discover Kakaʻako)	Medium	8/12/13 was forwarded email request by Reed Tamashiro; 8/13/13 replied to email and agreed to fill out online questionnaire (did not fill out)	**Unable to participate**
Kakaʻako Christian Fellowship	Location adjacent to project area	Low	7/23/13: sent request letter	**None**
Kaleikini, Paulette Ka`anohi	Cultural practitioner& raised in Kakaʻako; Interviewee (Spear et al. 2008)	High	8/7/13 sent letter asking if she was interested in further CIA participation	**Did not wish to participate**
Kamai, May Kalehua	Cultural practitioner& raised in Kakaʻako; Interviewee (Elison & McElroy 2011)	High	8/8/13 called & left message	**None**
Kang, Jundong (sp.?)	Hawaii Jokgu Assn., President (Re: activities at Mother Waldron Park)	Medium	8/14/13 received email from info@jokguusa.com referring Mr. Kang; 8/19/13 called Mr. Kang & set a date for Sunday 3pm at Mother Waldron Park	**Unable to participate**
Kapanui, Lopaka	Cultural practitioner& raised in Kakaʻako; Interviewee (Elison & McElroy 2011)		8/8/13 called & left message; he called back and spoke with me, said I could use testimony in Elison & McElroy 2011, asked to send him link to online questionnaire; no record of participation	**Says to use info from previous CIA**
Kapua, Charles	Cultural practitioner& raised in Kakaʻako; Interviewee (Spearing et al. 2008; Vogeler et al. 2010)	High	8/7/13 sent request letter	**None**
Kasparovich, Cass K.	C & C of Honolulu DPR, Sheridan Community Park, Recreation Director	Medium	8/6/13 sent email request; 8/6/13 Ms. Kasparovitch responds to email and agrees to participate; 8/6/13 send pdf of questionnaire	**Sent information via email**
Kawaiahaʻo Church	In project area	High	7/23/13: sent request letter	**None**
Ke Alaula Oka Malamalama	In project area	High	7/23/13: sent request letter	**None**
Keohokalole, Adrian Kealoha	Cultural informant in Spearing et al. (2008) and Maly et al. (2013)	Medium	8/7/13 sent request letter	**None**
Kuloloio, Manuel M.	Interviewed, in Spearing et al. (2008) & Elison (2013)	High	8/7/13 sent request letter	**None**
Lawaiʻa Magazine	Fishing articles island wide	Low	7/24/13: sent request letter	**None**
Lee, Antoinette "Toni"	Aloha Festivals, Parade Chair (Re: parades occurring in or near Kakaʻako)	High	7/29/13 sent email request; 8/18/13 agrees to participate; no record of online participation	**Unable to participate**

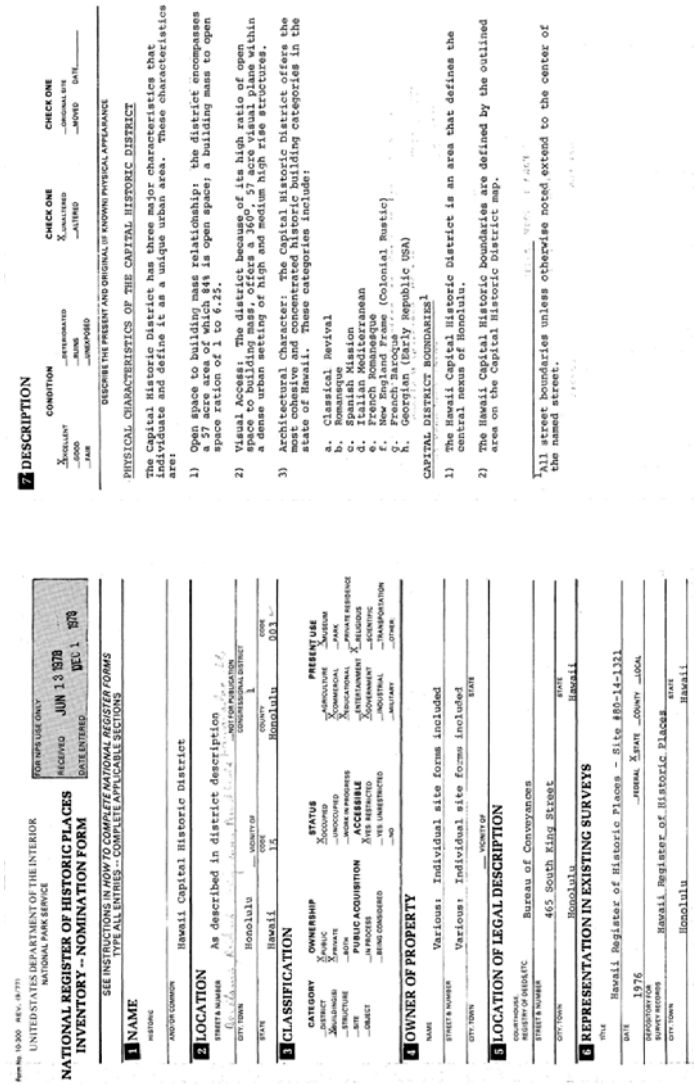
Kaka'ako Transit Oriented Development Supplemental Cultural Impact Assessment - Cultural Informants				
Name	**Affiliation/Association**	**Priority**	**Contact Log**	**Participation**
Lee, Michael Kumukauoha	Interviewed, in Elison (2013)	High	8/7/13 sent request letter; 9/5/13 Mr. Lee responds via email and provides a phone number to call for interview set up; call provided number, but number is wrong; 9/16/13 email Mr. Lee to inform him that the number did not work; 10/21/13; email Mr. Lee again to offer chance to participate in online questionnaire; 11/5/13 receive email from Mr. Lee stating I can use information given in the Mother Waldron EIS (HART?); 11/5/13 respond via email to thank Mr. Lee	**Refers to previous cultural studies for general area**
Lee, Zachary	Department of Parks and Recreation, West Honolulu Recreation Supervisor	High	7/29/13 Mr. Lee returns call placed with Department of Parks and Recreation, 8/6/13 sends email with contact info for Steve Min, park manager for Ala Moana Regional Park/Mother Waldron Neighborhood Park	**Refers Steven Min and Cass Kasprovitch**
Lyovin, Father Anatole & Emyko Lyovin	Holy Theotokos of Iveron Russian Orthodox Church, Located on Queen St. in Kaka'ako	Medium	7/25/13 sent request letter; 8/19/13 called & spoke with Father Lyovin's wife, Emyko, who had no knowledge of letter sent, but would speak with her husband about an informal interview (took down my contact info); 8/21/13 Emyko called and said her husband was too busy to participate	**Unable to participate**
Maas, Mathias	Native Books/Na Mea Hawai'i	High	7/29/13: emailed Native Books/Na Mea Hawaii info; 8/13/13:called and spoke with Mathias, said he was interested in an interview and agreed to do questionnaire;	**Interview**
Magdalena, Fred	Department of Filipino Studies at UH Mānoa (for Florentino Das info)	Low	7/25/13 sent request email; 7/25/13 Mr. Magdalena responds and refers Dr. Colmenares; 7/29/13 send thank you email	**Refers Dr. Colmenares**
Makiki Christian Church	Location adjacent to project area	High	7/23/13: sent request letter	**None**
Miller, Keao	Boy Scouts of America Aloha Council, Marketing and Development (Re: Annual Makahiki @ Ala Moana Park)	High	8/14/13 called and left message, also emailed request; 8/30/13 Keao attempts unsuccessfully to participate in online questionnaire; check website and it is operational	**Unable to participate**
Min, Steven	Ala Moana Regional Park Events Coordinator	High	8/6/13 send Mr. Min an email request; 8/6/13 receive response from Mr. Min, agrees to participate; 8/12/13 provides a spreadsheet with permitted parks activities	**Sent info via email**
Mayor's Office of Culture & the Arts	Could provide knowledgeable individuals	Medium	7/23/13 sent request letter	**None**
Neal S. Blaisdell Complex	Arts and Entertainment venue in Kaka'ako	High	7/23/13 sent request letter	**None**
Nickell, Abigail	MADD, State Executive Director (Re: MADD memorial at Kaka'ako Waterfront Park)	High	7/23/13 sent request letter; 8/13/13 completes online questionnaire	**Online Questionnaire**
Ola Nui!	In project area	Medium	7/23/13 sent request letter	**None**
One Love Ministries Calvary	In project area	Medium	7/23/13 sent request letter	**None**
Pan Pacific Festival	In project area	Medium	7/25/13 sent email request	**None**
Prieto, Mealii "Mae"	Honolulu Powwow Committee Oahu Intertribal Council, President (Re: Honolulu Powwow @ Thomas Square Park)	High	7/25/13 sent email request; several email exchanges from 8/13/13-8/29/13; 8/30/13 Ms. Prieto sends email explaining she lost the inputted data in the process of submittal of online questionnaire	**Unable to participate**
Soares, Dexter	Interviewed, in Elison (2013)	Medium	8/7/13 sent request letter	**None**

Kaka'ako Transit Oriented Development Supplemental Cultural Impact Assessment - Cultural Informants				
Name	**Affiliation/Association**	**Priority**	**Contact Log**	**Participation**
Stone, Marissa	Kewalo Marine Laboratory	Medium	7/25/13 sent email request; 7/31/13 forwards email to principal investigators at Kewalo Marine Lab; no response	**Forwards email to others**
Sutton, Robert	National Park Service, Chief Historian; Re: Falls of Clyde	Medium	7/25/13 sent email request	**None**
Tamashiro, Reed	Organizer for Discover Kaka'ako	Medium	7/23/13 sent request email; 8/12/2013 refers Katie Ka'anapu of Discover Kaka'ako	**Refers Katie Ka'anapu**
Thompson, Nicki	Interim Administrator State Historic Preservation Division	Medium	7/23/13 sent request letter	**None**
Ward Centers	In project area	Medium	7/23/13 sent request letter; Katie Ka'anapu is forwarded the request, but does not follow through with online questionnaire	**Unable to participate**
Wong, Jasper	POW!WOW!	High	7/25/13 sent request email; 7/25/13 Mr. Wong responds to email; 8/6/13 Mr. Wong submits online questionnaire; 8/29/13 request participation from Mr. Wong for FreshCafe as a cultural resource; 8/30/13 Mr. Wong submits online questionnaire for Fresh Cafe	**Online Questionnaire**
Wong, Michelle	Hawaii Dragon Boat Association (annual event at Ala Moana Park)	High	8/14/13 called &spoke with Michelle, she agreed to participate in online questionnaire; 8/14/13 emailed link to Ms. Wong; Ms. Wong filled out online questionnaire 8/26/13	**Online Questionnaire**
Woo, Debra	Diverse Earth Art, Kaka'ako	High	7/24/13 emailed Diverse ART to request participation; 7/24/13 received response from Ms. Woo asking for more info; 7/25/13 email more information to Ms. Woo; 8/6/13 receive response from Ms. Woo and Nicole Kealoha	**Refers Nicole Kealoha**
Woods, Thomas	Hawaiian Mission Houses, Executive Director	High	8/6/13 called Mission Houses Museum and left message; Mr. Woods returns call 8/7/13, explain purpose of CIA and he says he will check his schedule for interview appointment; no response	**Unable to participate**
Word of Life Christian Center	In project area	Low	7/23/13 sent request letter	**None**
Yamada, Lisa	Flux Magazine, Partner / Editorial Director	Low	7/24/13 sent online request for participation; 7/24/13 responds to request; agrees to view online questionnaire; 7/29/13 sends email to express that she does not feel like an appropriate respondent	**Unable to participate**

APPENDIX E

NRHP and State Register of Historic Places
Nomination Forms:

- Hawai'i Capitol Historic District
- Kawaiaha'o and Mission Houses
- Aloha Tower
- Mabel Smyth Memorial Building
- Post Office, Customhouse, and Courthouse Building (King David Kalākaua Building)
- Dillingham Transportation Building
- U.S. Immigration Office



Form No. 10-300 (Rev. 10-77)
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY—NOMINATION FORM

FOR NPS USE ONLY
RECEIVED JUN 13 1978
DATE ENTERED DEC 1 1978

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES—COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC
AND/OR COMMON Hawaii Capitol Historic District

2 LOCATION

STREET & NUMBER As described in district description NOT FOR PUBLICATION
CITY, TOWN Honolulu VICINITY OF CONGRESSIONAL DISTRICT 1
STATE Hawaii CODE 15 COUNTY Honolulu CODE 003

3 CLASSIFICATION

CATEGORY: __DISTRICT X BUILDING(S) __STRUCTURE __SITE __OBJECT
OWNERSHIP: X PUBLIC X PRIVATE __BOTH
PUBLIC ACQUISITION: __IN PROCESS __BEING CONSIDERED
STATUS: X OCCUPIED __UNOCCUPIED __WORK IN PROGRESS
ACCESSIBLE: X YES: RESTRICTED __YES: UNRESTRICTED __NO
PRESENT USE: __AGRICULTURE X COMMERCIAL X EDUCATIONAL X ENTERTAINMENT X GOVERNMENT __INDUSTRIAL __MILITARY __MUSEUM __PARK __PRIVATE RESIDENCE X RELIGIOUS __SCIENTIFIC __TRANSPORTATION __OTHER:

4 OWNER OF PROPERTY

NAME: Various: Individual site forms included
STREET & NUMBER Various: Individual site forms included
CITY, TOWN VICINITY OF STATE

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC. Bureau of Conveyances
STREET & NUMBER 465 South King Street
CITY, TOWN Honolulu STATE Hawaii

6 REPRESENTATION IN EXISTING SURVEYS

TITLE Hawaii Register of Historic Places - Site #80-14-1321
DATE 1976 __FEDERAL X STATE __COUNTY __LOCAL
DEPOSITORY FOR SURVEY RECORDS Hawaii Register of Historic Places
CITY, TOWN Honolulu STATE Hawaii

7 DESCRIPTION

CONDITION: X EXCELLENT __GOOD __FAIR; __DETERIORATED __RUINS __UNEXPOSED
CHECK ONE: X UNALTERED __ALTERED
CHECK ONE: __ORIGINAL SITE __MOVED DATE

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

PHYSICAL CHARACTERISTICS OF THE CAPITAL HISTORIC DISTRICT

The Capital Historic District has three major characteristics that individuate and define it as a unique urban area. These characteristics are:

1) Open space to building mass relationship: the district encompasses a 57 acre area of which 84% is open space; a building mass to open space ratio of 1 to 6.25.

2) Visual Access: The district because of its high ratio of open space to building mass offers a 360° visual linkage within a dense urban setting of high and medium high rise structures.

3) Architectural Character: The Capital Historic District offers the most extensive and concentrated historic building categories in the state of Hawaii. These categories include:

a. Classical Revival
b. Romanesque
c. Spanish Mission
d. Italian Mediterranean
e. French Romanesque
f. New England Frame (Colonial Rustic)
g. French Baroque
h. Georgian (Early Republic USA)

CAPITAL DISTRICT BOUNDARIES[1]

1) The Hawaii Capital Historic District is an area that defines the central nexus of Honolulu.

2) The Hawaii Capital Historic boundaries are defined by the outlined area on the Capital Historic District map.

[1] All street boundaries unless otherwise noted extend to the center of the named street.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW			
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	__ENGINEERING	__MUSIC	__THEATER
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	__TRANSPORTATION
__1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)
		__INVENTION		

SPECIFIC DATES 1794, 1845, 1850, 1893, 1894, 1900, 1909, 1969 BUILDER/ARCHITECT Various

STATEMENT OF SIGNIFICANCE

ARCHITECTURAL SIGNIFICANCE OF HAWAII STATE CAPITOL DISTRICT

HISTORICALLY AND TRADITIONALLY THERE has existed a centralization of all levels of government in Honolulu (refer to statement of historic significance).

This early centralization of government has resulted in an extraordinary concentration of public and private architecture reflecting the social and political evolution of the people of Hawaii. To quote Charles E. Peterson[1] "There are few cities in the world that have as many buildings dating from the first quarter of the century of their founding; and all within walking distance of one another, " it is fortunate that so much is included in an area small enough to be covered by foot." The Capitol District is much more than a historic place of government and private buildings, it is also a place of trees, shade and relative quiet; a place away from the city within the city. This district is a green open island standing between the high density business district of downtown Honolulu and the hustling, bustling tourist-automobile dominated envirnment of Waikiki.
The Capitol District and its present environs are an invaluable natural and cultural asset to the people of Hawaii.

[1] Charles E. Peterson is a member of the American Institute of Architects, past president of the Society of Architectural Historians, former member of the Philadelphia Historical Commission and adjutant Professor of Architecture at Columbia University.

HISTORIC SIGNIFICANCE OF HAWAII STATE CAPITOL DISTRICT

Historically, the Capitol Históric District is eligible for inclusion on the National Register of Historic Places because of its significance in association with events that have made a significant contribution to the broad patterns of our history; and because of its association

9 MAJOR BIBLIOGRAPHICAL REFERENCES

Kuykendall, Ralph S., The Hawaiian Kingdom Vols. I, II, III. Honolulu: University of Hawaii Press, 1953.
Historical Background of Buildings in the Honolulu Civic Center. Honolulu: State Archives, 1966.

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY 57 A

QUADRANGLE NAME _____ QUADRANGLE SCALE _____

UTM REFERENCES

	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING
A	04	618 525	2352225	B	04	618 525	2356300
C	04	617 765	2356300	D	04	617 765	2352225
E				F			
G				H			

VERBAL BOUNDARY DESCRIPTION

See Enclosed Form

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE Dale M. Lanzone - Architect and Gary Cummins - Historian
ORGANIZATION State Historic Preservation Office DATE Spring 1976
STREET & NUMBER 1151 Punchbowl Street TELEPHONE 548-7460
CITY OR TOWN Honolulu STATE Hawaii

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL X STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE Jane L. Silverman, SHPO DATE June 5, 1978

FOR NPS USE ONLY
I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

KEEPER OF THE NATIONAL REGISTER DATE 12-1-78

ATTEST: DEPUTY KEEPER DATE 11-27-78

GPO 921-803

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Building # and Name	Owner	Mailing Address
1. State Capitol/Grounds	State of Hawaii	State of Hawaii Dept. of Accounting and General Services P. O. Box 119 Honolulu, Hawaii 96810
2. Iolani Palace	State of Hawaii	See above
3. Aliiolani Hale	State of Hawaii	See above
4. Kawaiahao Church/Grounds	Kawaiahao Church	Kawaiahao Church 880 Mission Lane Honolulu, Hawaii 96813
5. Iolani Barracks	State of Hawaii	See above
6. Iolani Palace Bandstand	State of Hawaii	See above
7. YMCA	YMCA	Armed Services YMCA 250 South Hotel St. Honolulu, Hawaii 96813
8. YWCA	YWCA	Young Women's Christian Associa. P. O. Box 337 Honolulu, HI 96809
9. Hawaiian Electric Co.	Hawaiian Electric Company	(Building Owner) Hawaiian Electric Co. 900 Richards Street Honolulu, HI 96813 (Land owner) Bernice Pauahi Bishop Estate P. O. Box 3466 Honolulu, HI 96801

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Building # and Name	Owner	Mailing Address
10. Federal Building	United States of America	Federal Building Attn. Richard Kanada 300 Ala Moana Boulevard General Services Admin. Honolulu, HI 96850
11. State (Territorial Office Building)	State of Hawaii	See Building #1
12. Hawaii State Library (Main Branch)	State of Hawaii	See Building #1
13. Honolulu Hale/Grounds	City and County of Honolulu	City and County of Honolulu Building Department 650 South King Street Honolulu, Hawaii 96813
14. Honolulu Hale Annex/ Mission Memorial Bldg.	City and County of Honolulu	See above
15. Washington Place/ Grounds	State of Hawaii	See Building #1
16. St. Andrew's Cathedral	The Episcopal Church of Hawaii	The Episcopal Church of HI Bishop Edmond L. Browning Queen Emma Square Honolulu, Hawaii 96813
17. State Tax Office	State of Hawaii	See Building #1
18. Kapuaiwa Building	State of Hawaii	See Building #1
19. Mission Houses	Hawaiian Mission Children's Society	Hawaiian Mission Children's Society First Hawaiian Bank 161 South King Street Honolulu, Hawaii 96813
20. The Kamehameha Statue	State of Hawaii	See Building #1

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3) The district boundaries are specifically:

a. Beretania Street from the intersection of Punchbowl to Richards Street including Washington Place and grounds, and including that portion of Saint Andrew's Cathdral and grounds (TMK: 2-01-18-02)[2] 355 feet from Beretania directly along the Saint Andrew's/Washington Place boundary and there making a right angle and extending to the Makai corner of, and including Queen Emma Square (TMK: 2-01-18-04).

b. Richards Street from the intersection of Beretania Street to Queen Street including the Armed Services YMCA and grounds (TMK: 2-01-17-01), the YWCA and grounds (TMK: 2-01-17-09), and the Hawaiian Electric Building (TMK: 2-01-16-01).

c. Queen Street from the intersection of Richards Street to Mission Lane including the State Tax Office Building and grounds (TMK: 2-01-26-01).

d. Mission Lane from the intersection of Queen Street to Kawaiahao Street, following the eastern boundary of the Mission Houses to King Street.

e. King Street from the intersection of Kawaiahao Street to Punchbowl Street including Honolulu Hale and Honolulu Hale Annex with grounds (TMK: 2-01-33-07).

f. Punchbowl Street from the intersection of King Street to Beretania Street.

[2] The boundaries defined by the Hawaii State Tax maps are to be understood as (unless otherwise noted) the registration site boundaries of the historic site.

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HAWAII CAPITOL HISTORIC DISTRICT BUILDINGS AND MONUMENTS

The following is a list of buildings, structures, and monuments of historic and architectural significance sited within the Capitol Historic District:

Building	Building #	Registration Date	Registration Number
State Capitol/grounds	1		
Iolani Palace/grounds *	2	12/31/58	80-14-9912
Aliiolani Hale	3	8/18/71	80-14-9908
Kawaiahao Church/grounds**	4	7/17-18/62	80-14-9991
Iolani Barracks	5	10/17/72	
Iolani Palace Bandstand	6	12/31/58	80-14-9912
YMCA	7		
YWCA	8		
Hawaiian Electric Company	9		
Federal Building	10	5/22/73	80-14-9952
State (Territorial) Office Building	11		
Hawaii State Library (King Street)	12		
Honolulu Hale/grounds	13		
Honolulu Hale Annex (Mission Memorial Building & Annex)	14		
Washington Place/grounds	15	10/17/72	80-14-9907
Saint Andrew's Cathedral ***	16	5/01/72	80-14-9915
State Tax Office	17		
Kapuaiwa Building	18	9/19/72	80-14-9970
Mission Houses	19	7/17-18/62	80-14-9991
The Kamehameha Statue	20		

TERMS OF REGISTRATION

All of the buildings and grounds that have been named and registered in previous historic registration documents and are sited within the boundaries of the Capitol Historic District are subject to all controls of district registration as set forth in Hawaii Revised Statutes, Chapter 6.

*Includes Old Archives Building (1906) and old mausoleum mound (1825).
**Includes Lunalilo's Tomb (1876) and the adobe schoolhouse (1835).
***Includes Tenny Hall.

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BUILDING DESCRIPTIONS

THE HAWAII STATE CAPITOL BUILDING #1

BACKGROUND:
The Hawaii Capitol building was designed for the people of the State of Hawaii by the architects Belt, Lemon, and Lo in association with John Carl Warenecke and Associates.
Initial planning began in 1959; ground was broken November 10, 1965. The building was dedicated on March 15, 1969.

OVERVIEW:
The Capitol Building is sited on a full city block that joins without interruption (on the makai side) the grounds of the Iolani Palace. On the ewa and Diamond Head sides the site is bordered by Richards St., and Punchbowl St. South Beretania St. is the mauka boundary.

ARCHITECTURAL DESCRIPTION:
Exterior:
The Capitol building is a structure of steel reinforced concrete and structural steel. The building is rectangular with dimensions of 360 ft. X 270 ft. The 360 ft. lengths are the makai and mauka sides. The building's height is 100 ft.
It was the intention of the architects that the building's various components read as sign/symbols relating to Hawaiian natural, and cultural phenomena.[1] The building is a composite of major motivated terms; terms that construct a Markoff chain[2] of linked design components.

1

2
Weaver, "Recent contributions to the Mathematical Theory of communications," P. 267 "A system which produces a sequence of symbols (which may, of course, be letters, musical notes or signs, say, rather than words) according to certain probabilities is called a stochastic process and the special case of a stochastic process in which the probabilities depend upon the previous events is called a markoff process or a markoff chain."

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These components are:

SIGN	SIGNIFIER
1. Rectangular pool surrounding and enclosing the building.	Ocean, surrounding the islands, inference is to the islands of Hawaii and surrounding sea.
2. 40 reinforced concrete columns originating from the pond terminating and supporting the fourth floor (entabulature).	Coconut palms, inference is to the relationship of the coconut palm to early Hawaiian economy and culture.
3. Conical shaped ceramic tile legislative chambers.	Volcano, inference is to geological formation of Hawaiian islands.
4. Interior lobby open on the makai and mauka sides; roof opened to the sky.	Open society, inference to the acceptance of all aspects of the natural and cultural environment.
5. Reinforced concrete fourth floor overhang.	Inference is to the Greek entabulature and western architectural motivators.

Interior:

The main entry is through the mauka facade. The main lobby is an unobstructed space open to the mountains, sea, and sky. Legislative chambers are on the ewa and Diamond Head sides of the lobby. Elevators; one in each corner of the building give access to the second, third, and fourth floors.

The upper floor contains the offices of the Governor and Lt. Governor.

Architectural Significance:

The Hawaii State Capitol building is the single most dominant work of public architecture in the State of Hawaii. When the State Capitol building was conceived, it was not meant to be just another modern structure. The building was intended to reflect Hawaii and its people.

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To quote from an address given by Governor John A. Burns, "The open sea, the open sky, the open doorway, open arms and open hearts - these are the symbols of our Hawaiian heritage. In this great State Capitol there are no doors at the grand entrances which open toward the mountains and toward the sea. There is no roof or dome to separate its vast inner court from the heavens and from the same eternal stars which guided the first voyagers to the Primeval beauty of these shores. It is by means of the striking architecture of this new structure that Hawaii cries out to the nations of the Pacific and of the world, this message: We are a free people.....we are an open society.....we welcome all visitors to our island home. We invite all to watch our legislative deliberations; to study our administrative affairs; to see the examples of racial brotherhood in our rich cultures; to view our schools, churches, homes, businesses, our people, our children; to share in our burdens and our self-sorrows as well as our delights and our pleasures. We welcome you! E Komo Mai! Come In! The house is yours!"

THE ARMED SERVICES YMCA #7

The Armed Services YMCA was designed by San Diego architect Lincoln Rogers in conjunction with the local Honolulu architectural firm of Emory and Webb. The building was dedicated March 16, 1928.

Overview:

The Armed Services YMCA building stands at the corner of Richards and Hotel Streets; which was the original site of a Royal Hawaiian Hotel which was used as the YMCA.

ARCHITECTURAL DESCRIPTION:

Exterior:

The building's plan is U-shaped with a central court (with an open second story lanai overlooking the makai end of the central open court) containing a swimming pool with surrounding deck lanais. The building's roof is a low ridge hip with green glazed straight mission barrel tile surfacing.

The building is constructed of steel reinforced concrete and structural steel.

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Fenestration is symmetrical and in parallel runs of metal frame casements. The broad overhang roof eaves are painted on the undersides with abstract Mediterranean design motifs.

The entry portico is fashioned from cut and finished coral, the portico consists of three flat arched entryways, the entryway surrounds are of rusticated coral block with four engaged moresque columns supporting segmented freestanding Triglyphs; immediately above each doorway's flat arch is a large cartouche with base relief symbols representing the three branches of the armed services.

Above the main entry portico is an open groin vaulted loggia that traverses the second story frontispiece to join the projecting half-round open loggias at either end of the portico.

The YMCA is five stories in height; with a fifth floor open loggia (supported by metal Corinthian columns) surrounding the entire fifth floor.

Interior:

Entry through the main portico gives access to central lobby with hotel like check-in desk and general lounge area. The first floor contains a gymnasium, games hall, restaurant, locker rooms, barbershop, tailor shop, curio shop and billiard room. The second floor contains various game rooms and public/private meeting spaces. The third through fifth floors contain two hundred and sixty-eight sleeping rooms.

Architectural Significance:

This building is a member of a unique and declining category of buildings; it is a first generation example of major Spanish Mission architecture, and stands in direct design relationship to the Hawaiian Electric Building, the Federal Building, the YWCA, and Honolulu Hale. At this time, the YMCA and Julia Morgan's YWCA are the only buildings in the city core area offering open and unrestricted social leisure services to the core city population.

The YMCA is an important social and physical factor in the generation of the sense, both spacially and physically of the Capitol District.

Current State of Repiar: Good to excellent.

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THE HAWAIIAN ELECTRIC COMPANY DOWNTOWN OFFICE #9

The Hawaiian Electric Company building is of Mediterranean derivation. The building was designed by New York architects York and Sawyer with local assistance from the Honolulu firm of Emory and Webb, and was completed in 1927 at a total cost of 750,000 dollars.

Overview:

The Hawaiian Electric Building fronts Richards Street and is bounded on the east by South King Street; to the west by Merchant Street.

ARCHITECTURAL DESCRIPTION:

Exterior:

The Hawaiian Electric Company is a four-story building of trapezoidal plan. The building is constructed of reinforced concrete and steel framing; the roof form is a composite of hip, gable, and flat with parapet, the hipped/gabled roof sections are surfaced with straight barrel mission tile.

The outstanding exterior features are the ground floor story and half stilted arched windows with Churriguera[1] decorated column supports, and the makai, Diamond Head corner cupola with its low rise polygonal tiled roof and lantern.

The second and third story windows are rectangular metal framed casements with stone sills. The third floor windows are arched and set in groups of two with a full major arch surround: there are three such groupings on the Richards Street facade, and eight grouping on the King Street facade. There is a three bay groin vaulted entry portico on the ground floor of the Richards Street facade with a hand painted ceiling by Julian Jarnsey.

[1] Characteristic of the forms introduced into Spanish architecture by Churriguera, Ribera, and other designers early in the 18th century. A good illustration of the form can be seen in Trent Elwood Sanfords, The Architecture of the Southwest, Greenwood Press, plate 27.

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Interior:

There are three entries and exits, the main entry is to the rear (ewa end of the building). There is an arched entry on either side of the building giving access to a vaulted hallway/mall, this hallway bisects the ewa end of the building and acts as a central foyer coordinating (spacially) the first floor spacing. The stairwell leading to the second and third floors originates from the ewa Hallway. The third entry is through the Richards Street portico, and gives access to the general service offices of the main ground floor space. This space has a richly decorated (Plaster mouldings/hand painting) coffered ceiling done by J. Rosenstein. The upper floors contain general administration offices as well as the Hawaiian Electric Company library.

STATEMENT OF SIGNIFICANCE:

The Hawaiian Electric Building has some of the architecturally most elegant interior spaces of any buildings or building in the State of Hawaii. The richness of the decorated plaster, sculptured and hand painted ceilings, the fine detail of the Churriguera stonework, and the combination of wrought iron and brass fitting, grill work and gates used throughout the building lend a character of refinement to the structure of the building that will never again be seen in commercial architecture. This is a rare and intelligently articulated example of Spanish Colonial Architecture.

CURRENT STATE OF REPAIR: Excellent

STATE TERRITORIAL OFFICE BUILDING #11

Background:

The Territorial State Office Building was designed for the United States Federal Government by architect Arthur Reynolds in 1926 to house the Hawaii Territorial Administrative offices.

Overview:

The Territorial State Office Building is sited at the corner of King and Punchbowl Streets directly across from the Hawaii State Library and adjacent to the Judiciary Building, Aliiolani Hale.

ARCHITECTURAL DESCRIPTION:

Exterior:

The structure is six stories in height, rectangular in plan and has a flat asphalt roof with penthouse structures.

Construction materials are: reinforced concrete, and structural steel. The building is constructed of two major architectural elements: at grade there is a two story (with basement) horizontal architectural element which acts as base for a vertical element rising a full six stories. The vertical element is centered from ewa to Diamond Head on the horizontal element. The two story horizontal element extends 67 feet on either side of the vertical element. Exterior windows are double-hung and run in symmetrical parallel rows.

Exterior wall surface treatment consists of pilasters marking windows divisions and terminating in classical cornices. The buildings frontispiece is marked by a massive straight stair with double landings leading to the segmental archway-entry with heavy protruding imposts. Above the archway there is a five foot peaked architrave with terminal taenia[1] supporting two massive full round corinthian columns extending three stories in height terminating in the sixth story entablature.

Interior:

Entry is gained through either the mauka or makai facades. The main entry being the mauka entry.

The dominant interior space is the central lobby with second story mezzanine and leaded glass decorative dome; the dome design is a graphic depiction of the coat of arms of the Hawaii Territory. The interior spaces, other than the main lobby, are simple unadorned offices and administrative spaces of no architectural consequence.

STATE OF SIGNIFICANCE:

The major environmental asset of this structure is its location within the Capitol District area; the building and its grounds blend, and add to the total texture, scale, and historic character of the Capitol Distric

[1] Taenia (tee'nea) the fillet separating the Doric frieze from the architrave.

HAWAII STATE LIBRARY #12

Background:

The Hawaii State Library was designed for the Territory of Hawaii by New York architect Henry D. Witfield in association with Honolulu architect H. L. Kerr. The design was commissioned in 1909, the building was completed in February 11, 1913.

Overview:

The Hawaii State Library is sited on Punchbowl Street directly across from Honolulu Hale.

ARCHITECTURAL DESCRIPTION

Exterior:

In plan the Hawaii State Library is quadrangular with an open central court.

The roof structure is a hip design, with green glazed Tuscan clay tiles. The library's main entry faces King Street and is approached via a fifteen foot wide brick edged asphalt walkway crossing a green grassy open lawn. The walkway terminated at a broad stairway of six rises leading to a main portico landing. The portico is supported by eight reinforced concrete Tuscan columns (20 feet in height). The columns support a single unadorned architrave running the full length of the three stilted arches, the center arch acting as the main entryway. These arches are eighteen feet high and have bronze inset grille work. The grille work surrounds the entry doors. On either side of the doors are side lights, above the doors are projected pulvinated friezes supporting bronze relief pediments. The ewa and Diamond Head facades of the Library are simple white plastered walls with pilasters marking wall divisions containing four rectangular double-hung windows. The mauka dacade has an entry drive-up (loading and unloading) approach to the interior courtyard.

Interior:

The main lobby is covered by a 16 X 30 foot coffered ceiling with

skylight. A second story mezzanine overlooks the lobby. The lobby contains the book checkout desk, various tables, chairs, and bookracks. Directly through the lobby one enters the central court, an ivory covered open space with bisecting walkways, and a surrounding first and second story loggia. In all of this is an extremely pleasant space, a place of cool and relaxing spaces shaded by flowering trees, and the overhangs of the loggia ceilings. Both the Diamond Head and ewa wings contain the Hawaii Library books collection, as does the mezzanine King Street floor.

ARCHITECTURAL SIGNIFICANCE:

There are two points of major significances:

1. The location and scale of the structure is a supplemental element to the total sense/character of the Capitol District. The Hawaii State Library occupies a pivotal position within the architectural landscape of the Capitol District; in conjunction with the Iolani Palace, this building stands at the center of the Capitol District and creates an architectural scale counterpoint to the buildings surrounding the Iolani Palace grounds.

2. Of particular architectural note is the use of bronze grille work insets in the arches of the main entry, this is the only example of this particular architectural treatment in the State of Hawaii. Also of note is the architect's strict adherance to classical design principles (except for the inclusion of the Roman derivative arched portico element with bronze grille work).

Site:

The Hawaii State Library site is level and runs from South King Street to the State Capitol Building grounds mauka/makai. The Library is set back some 123 feet from South King Street and 35 feet from Punchbowl Street. The grounds run uninterrupted to the grounds of Iolani Palace forming a continuous and expansive landscape.

The site is well tended and planted with various indigenous shrubs, flowering plants and trees.

PRESENT CONDITION: Good to excellent.

HONOLULU HALE AND GROUNDS #13

Background:

Honolulu Hale was designed by architects C. W. Dickey, Hart Wood, Robert G. Miller, Guy Rothwell and Marcus C. Lester. The building was opened for city use November 26, 1929. It was built for and has continued to serve as the City Hall of Honolulu. The city government long ago outgrew Honolulu Hale; but it continues to house the Mayor's office, City Council and principle staff agencies.

Overview:

Honolulu Hale is sited on the corner of King and Punchbowl Streets, directly across Punchbowl Street from the Hawaii State Library.

ARCHITECTURAL DESCRIPTION:

Honolulu Hale is four stories in height with a single six story tower fronting Punchbowl Street. The building's plan is rectangular. Construction materials are reinforced concrete and structural steel. The roof design is complex, a combination of sheds and hips intersect forming a variety of roof shapes. Roof surfacing material is terra cotta clay tile.

Honolulu Hale's main entry is through the King Street facade. There are three basket arched entryways with compound rectangular portal insets. On the exterior and above the arched entryway is an open balcony running the length of the building. The Punchbowl Street facade is marked by the six story tower with its tile polygonal low rise roof. This tower is medieval in design character, small window penetrations supporting hood moulds, and carved stone balconies. This facade is complex in design and has an assortment of open and closed balconies, loggias, asymmetrical fenestration, deep recessed casement windows, flush metal double-hung windows, windows with cast concrete grille work, open and closed arched windows; similar fenestration is employed on the King Street facade.

Interior:

Entering the building through the King Street facade, there is an open central court with grand stairway leading to the fourth floor mezzanine

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at the mauka end of the cental court. The central court has a painted and highly ornate coffered ceiling with the central ceiling section open to the sky. The interior treatment of the central court is reminiscent of an Italian Bargello[1] of the Middle Ages. The carved stone work on the columns, interior and exterior balconies and general decorative trim is the work of the Italian sculptor, Mario Valdastre[2]. The nonpublic interior spaces are used by the various branches of government.

STATEMENT OF ARCHITECTURAL SIGNIFICANCE:

Honolulu Hale is a prime example of first generation Hawaii adapted Spanish Colonial/Italian Architecture; it is a massive structure, yet projects a sense of human scale that is a hallmark of the Hawaii adapted Spanish Colonial Architecture.[3]

Revival

Honolulu Hale along with the YMCA, YWCA, the Federal Building, the Tax Office Building, and the Hawaiian Electric Building set the precedent of architectural scale for the Hawaii Capitol District.

Throughout the nineteen twenties local architects (after being influenced by mainland architects York and Sawyer, and Bertrum Grovsner Goodhue) for the first time self-consciously approached the question of an indigenous architectural design characteristic for Hawaii. From 1921 until the middle 20's there was a drive toward Italian, Spanish Colonial, Spanish Mission architectural forms. During the 30's and in the hands of Hart Wood (and influenced by B. G. Goodhue's Honolulu Academy of Arts building) the Spanish Colonial and Mission style became the Hawaiian style with the adaptation of the high ridge hip roof. Honolulu Hale represents an extremely unique aspect of this architecturally historic building phase in Hawaii.

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[1] Headquarters of an army watch or civil police.

[2] Mario Valdastre was brought to Hawaii by San Francisco architect Julia Morgan to work on her YWCA project. Vladastre stayed on in Hawaii for forty years, and then retired, with his wife in Northern Italy. He has recently come out of retirement, and returned to Hawaii to work on the Iolani Palace.

[3] Unlike many mainland examples, ref. 54, California State Building, architect Bertrum G. Goodhue, The American Architecture of To-Day. G. H. Edgell; Charles Scribner's Sons, New York, 1938.

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HONOLULU HALE ANNEX/THE MISSION MEMORIAL BUILDING AND ANNEX #14

The Mission Memorial Building and Annex were commissioned and built for the Hawaii Evangelical Association. The Mission Memorial Building and attached auditorium were constructed during the period 1915-1916 in commemoration of the approaching centennial anniversary of the arriving first missionaries. This structure was designed by architect H. L. Kerr. The mission annex was completed January 12, 1930 and dedicated April 11, 1930. The structure was designed by architect Mark Potter.

Overview:

These buildings are sited on King Street between Honolulu Hale and the City and County Building.

ARCHITECTURAL DESCRIPTION:

The Mission Memorial Building is two stories in height and rectangular in plan. The roof is a low pitched mansard with newel post balustrade parapet.

Structure:

The building's foundation is reinforced concrete from the water table to six inches above grade. Walls from the foundation upward are of mortar bound English Bond red brick and reinforced concrete. Windows are metal frame double-hung rectangles with white painted concrete sills and lintels. The King Street and ewa facades have roof joining over-hung pediments that are the porticos for the King Street main entry and the ewa side entry. These porticos are supported by five free-standing tuscan columns with Ionic capitals. The Diamond Head facade has a two story half round portico enclosed on its second level. This portico is supported by six concrete saddle backed dormers with arched single hung windows. The porticos enclosed second level has full glass walls and a wrought iron balustrade. The ground floor level has a simple rectangular entry door with concrete lintels. The rear of the building has an open colonnade connecting the Mission Memorial Building with its auditorium.

Interior:

Entry to the building is gained through either the ewa or Diamond Head

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porticos. The original King Street entry has been closed off and its interior spaces have been converted to offices. The interior of the building has been extensively altered to accomodate various administrative facilities; further alterations to the interior spaces are forthcoming. Access to the second story is gained via a stairway which has an interesting decorative wrought iron handrail. The second story has been extensively altered, but of interest is the overhead skylight with intricate tracery. Unfortunately this skylight has been roofed over.

STATEMENT OF SIGNIFICANCE

This building is styled in the manner of Georgian Revival Architecture. The Georgian style denotes a British architectural period during the reign of Ann and the Four George 1702-1803. This style was to be the prominent architectural style (for major buildings) during the early republic period in the United States 1702-1830. The style was also known as Neo-Classical, and Jeffersonian Classicism, (also to be called Roman Revival). The Mission Building and its side buildings are the only examples of Jeffersonian Classicism in the State of Hawaii. These buildings encompass a unique architectural category and should be considered valuable.

MISSION MEMORIAL AUDITORIUM

Background:

The Mission Memorial Auditorium was designed by H. L. Kerr as a support facility (auditorium) for the Mission Memorial Building. It was dedicated with the Mission Memorial Building in April 1916.

Overview:

This building is a single-story structure sited on the mauka side of the Mission Memorial Building. It is attached to the Mission Memorial Building by a colonnade supported by concrete Corinthian columns.

ARCHITECTURAL DESCRIPTION:

Exterior:

The Auditorium building has an asphalt shingled hipped roof. The

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building's structure is reinforced concrete with red brick English bond surfacing, windows are metal double-hung, with sill set on grade and terminated at the roof eaves.

Interior:

Entry is gained via the colonnade portico. The interior space has been extensively altered. The once high auditorium ceiling has been lowered to accomodate a more comfortable office atmosphere. The building at one time had a stage traversing the mauka end of the auditorium, this stage has been paneled and converted into office space.

STATEMENT OF SIGNIFICANCE:

This building's significance is the same as that expressed for the Mission Memorial building.

MISSION MEMORIAL ANNEX

Background:

This structure was designed by architect Mark Potter. The cornerstone was laid January 12, 1930. The building was dedicated April 11, 1930. The Annex's original use was as the Christian Education Building.

Overview:

The Mission Memorial Annex is on the Diamond Head side of the Mission Memorial building and auditorium.

ARCHITECTURAL DESCRIPTION:

Exterior:

The Annex building has an asphalt shingled hipped roof. The building's frontispiece is two stories in height and extends a bays width on either side of the two story frontispiece. The annex is constructed of reincorced concrete with red brick English Bond surfacing, its metal windows are double-hung and have white concrete sills and lintels. There are two entries: one in the frontispiece, and one to the rear of the building. The main entryway has a classical surround composed of two Ionic columns with a simple unadorned entabulature.

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Interior:

At this time (August 27, 1975) the interior is being extensively remodelled, there is little left of the original interior spaces except the stairway leading to the second story. This stairway has a well formed wrought iron handrail.

ARCHITECTURAL SIGNIFICANCE:

Same as the Mission Memorial and auditorium buildings.

TAX OFFICE BUILDING (HALE AUHAU) pgs 4 21

Background:

Hale Auhau is a State Office building designed by Public Works architect, Harry K. Stewart. The building was completed in 1939.

Overview:

The structure is sited on Queen Street between Mililani and Punchbowl Streets directly across Queen Street from the Kapuiwa Building.

ARCHITECTURAL DESCRIPTION:

Exterior:

The building is a three-story reinforced concrete structure. The roof is hipped and surfaced with terracotta tile, the roof hip rafters are 'broken' to generate a Japanese roof design effect. The structure's plan is a closed 'I' with the length facing Queen Street.

Hale Auhau has two dominant architectural features:

1. The entry portico which spans the length of the Queen Street facade tying the two parallel end wings of the 'I' plan together. The portico is 17 x 40' and has square cut and finished coral columns supporting a simple stylized architrave.

2. Concrete grille work: Various windows have inset cast concrete grilles of a Hawaiian design derivation. Exterior window fenestration has two forms: from grade and extending to the third floor are two story arched windows, third story windows are simple

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rectangular casements. The use of two story windows extending through the first and second floors gives the impression of a two story building rather than a three.

Interior:

The building is entered through the main portico. Entry doors are metal and glass of 'modern industrial design.' The main interior space is a two story rotunda. The rotunda is bordered by service counters that give access to the various office personnel on the first floor. The first floor is an open unpartitioned space penetrated by concrete structural columns.

The second story is gained by a stairway to the rear of the rotunda. The second floor is identical in construction to the first. Unobstructed, unpartitioned space with penetrating columns (but with no central rotunda access).

The third floor contains a courtroom, and various office and supply rooms.

Site:

Hale Auhau is sited on a level well-tended grassy lot. Plants consist of palms, and one large monkey pod tree.

STATEMENT OF SIGNIFICANCE:

The significance of Hale Auhau rises from its close design relationship to the other Spanish Mission and Colonial buildings within the Capitol District. In and of itself, the Tax Office Building is of no great architectural merit. It is a second generation derivation of the original 1920's Capitol District Spanish Mediterranean architecture, but it does maintain and support the overall texture and design sense of the Capitol District and this is an important feature (within a district) as individual architectural merit.

CURRENT STATE OF REPAIR: Good to excellent

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with the lives of persons significant in our past. After 1845, as Gavan Daws has written, "It was true enough throughout that period (1845 - present) to say that what happened in rural Oahu and on the outer islands might have nothing but local significance; what happened in Honolulu might very well affect all Hawaii."[1]

1 R. Warwick Armstrong (ed), Atlas of Hawaii (Honolulu: University Press of Hawaii, 1973), P. 90

In pre-contact Hawaii, the area of Oahu now encompassed by the city of Honolulu had some importance as a place of sacrifice (Punchbowl), as a food gathering center (the fishponds of Moanalua and Halawa), and as a place of residence for Oahu alii (Waikiki). However, it was not until after 1794, when Western mariners recognized the potential value of Honolulu's deep and protected harbor that it began to achieve primary importance as a commercial, urban, and government center.

In the period of time after unification of the Hawaiian archipelago by Kamehameha I, it can be said that capitol existed wherever the king happened to be. Kamehameha I, II, and III enjoyed travelling around the islands on progressions similar to those of the English Plantangent kings, sampling the hospitality and loyalty of their subjects, and accompanied by a large retinue that tended to deplete the resources of the areas they visited.

The Hawaiian monarchs did not fail to recognize the importance of Honolulu, however, Kamehameha I established harbor fees and controlled the growing commerce centered there. During his residence in Honolulu from 1804 to 1811, the town became firmly established as an economic center.

The advent of the sandalwood trade, whaling, and the establishment of Christian missions after 1820, led to a greater influx of Europeans. Most settled in Honolulu for economic reasons. From the time of the death of King Kamehameha I in 1819 through the short reign of Kamehameha II and into Kamehameha III's rule, problems caused by the clash of Western business and religious interests and Hawaiian

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customs grew. The old style of Hawaiian government which had worked fairly well under Kamehameha I, proved unable to cope with these new problems by the time of Kamehameha III. One problem in particular was that of the lack of a permanent place of government, where representatives of the Western nations and the Hawaiian government could meet.

In 1838, the ruling chiefs appointed William Richards, an American missionary to serve the Hawaiian government as an advisor. Afterwards, other Western advisors were appointed to government posts such as Dr. Gerrit Judd, John Ricord, and Robert C. Wyllie. They saw the necessity of reinforcing the position of the king in every way possible while also establishing the rudimentary forms of parliamentary democrary.

They established formal systems of court etiquette, and more importantly, convinced the king and the chiefs of the need for a permanent capitol. Kamehameha III preferred Lahaina, Maui, which since the arrival of foreign whaling shops in 1820, had become a boom town. In the long run, however, Lahaina with its open roadstead, subject to the vagaries of wind and current, could never compete with Honolulu. Finally, in February, 1845, Kamehameha III moved permanently to Honolulu and established his residence on the approximate site of the present Iolani Palace. In May 1845, he formally opened the legislative session in Honolulu with a speech from the throne. Five years later, Honolulu was officially proclaimed the capitol of Hawaii.

The first Iolani Palace was constructed by Charles Kanaina in 1845, and was located on the grounds of the present Iolani Palace. It was of coral blocks, one story in height, and was used by Kamehamehas III, XV, IV, and V, as well as Lunalilo and Kalakaua before being torn down by the latter monarch to make room for the present Iolani Palace.

In 1850, funds were appropriated by the legislature for the construction of a Court House. Work began on it in 1851, and it was completed in 1852, with most of the work being done by convict-labor. It served as the actual place of business. Located on Queen Street, between Fort and Bishop Streets, it served as the actual place of business for the Hawaiian government until the

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construction of Aliiolani Hale on King Street, between Richards and Punchbowl, in 1874.

Prior to the construction of the Court House, and the movement of the capitol to Honolulu, other structures were built in the Capitol Historic District that tended to establish it as a center of importance. In 1820, the first Christian missionaries constructed their mission on land deeded to them by Governor Boki of Oahu. This land was at the present site of Kawaiahao Church, at the corner of Punchbowl and King Streets Makai-Diamond Head. In 1821, the first wood frame mission house was completed, adjacent (Diamond Head) of the mission. In 1823, a coral-block structure was built to contain the mission's printing press. The third missionary building is the Chamberlain House, completed in 1831, also of coral block construction. The missionary enclave at this location became headquarters for the missionaries throughout Hawaii. This tended to centralize the Protestant religious structure government at the Capitol district, and thus give the area additional importance.

In 1825, the bodies of King Kamehameha and his wife Kamamalu were interred in a coral house built on what is now the Iolani Palace grounds. The bodies remained there until 1865, at which time they were transferred to the Royal Mausoleum in Nuuanu Valley.

Im 1835, an adobe schoolhouse was constructed by the missionaries behind the mission church. In 1842, the present Kawaiahao Church was completed at the site of the original mission. Only a year later, the Roman Catholic Our Lady of Peace Cathedral, was completed on the Mauka-Ewa corner of the capitol district. This church was the headquarters for the Roman Catholic Dioscese of Honolulu.

In 1846, Captain John Dominis, an American, completed his home, located on the Mauka side of Beretania Street, across from the present State Capitol building. After his death, it passed on to his heirs, including his son's wife, Princess Liliuokalani. She lived in it until her death, after which it was purchased by the Territory of Hawaii for use as the Governor's mansion, which is its present use. It is the oldest continually-occupied structure in the State. All of this construction tended to establish an aura of importance to the area of the proposed Capitol Historic District.

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The Iolani Barracks were built in 1871 to house the Royal Household Guard. The architect was Theodore Heuck, a German. The barracks were originally located on what is now Hotel Street, but were moved in 1965 to make way for the new State Capitol building.

In 1874, Aliiolani Hale, constructed to house the expanding Hawaiian government was opened despite complaints that it was located so far out of town, and was much too large. This structure, originally designed as a palace by Thomas Rowe, an Australian architect, was altered in the planning stage by Robert Sterling, the Superintendent of Public Works, to become a parliament-government office building. In 1893, Iolani Palace became the "Executive Building," and Aliiolani Hale became the "Judiciary Building."

St. Andrews Cathedral, designed in Britain by B.F. Ingelow, was begun in 1867 as a memorial to King Kamehameha IV. Funds for the cathedral were raised the King's widow, Queen Emma. Completion of the construction called for in the original plan was in 1902.

In 1882, construction of the new Iolani Palace, the centerpiece of the Historic Capitol District, was completed. It was the only royal palace in the United States. It served as a place of residence for its builder, King David Kalakaua and later, Queen Liliuokalani, until the overthrow of the monarchy in 1893.

A bandstand was constructed on the grounds in 1883. The Provisional government occupied the palace with its offices after the revolution, and named it the "Executive Building." Legislative sessions were held in the structure form 1895 until 1968, when the new state capitol building was opened. At present, Iolani Palace is undergoing a total restoration and will open in 1978 as a museum.

In 1884, the Kapuaiwa Building was constructed to house government records. It was named after Kamehameha V (Lot Kamehameha Kapuaiwa). It never served as a record center, however, and was instead used to house government offices which could not be fitted into Aliiolani Hale.

The next public contruction occuring in the Capitol Historic District was the Attorney General's Building (Old Archives Building),

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completed in 1906. This building was constructed to house public records, and was designed by the noted architect O. G. Traphagen. It was the first building in the United States built for the express purpose to serve as an archives structure.

The Hawaii State Library building on the Mauka-Ewa corner of Punchbowl and King Streets was completed in 1913 from a design by Honolulu architect H. L. Kerr and New York architect Henry Witfield.

The Mission Memorial Building was dedicated in 1916 as a memorial to Protestant missionaries who first arrived in Hawaii in 1820. It was used by the Hawaiian Board of Missions as a headquarters. In 1945, the City and County of Honolulu purchased it, but leased it to the mission board until 1947, when City and County offices were moved into it.

In 1922, the first Federal construction in the Historic Capitol District was completed--the U.S. Post Office, on Richards Street, and nect to Aliiolani Hale.

In 1926, the Territorial Office Building was completed. It was designed by Arthur Reynolds to house the offices of the expanding territorial government, but was generally not well received by architectural critics.

The Hawaiian Electric Company building, on the corner of Richards and Merchant Streets, was completed in 1927. This attractive structure, designed by York and Sawyer, the same New York architects who designed the U.S. Post Office building across Richards Street from it. The building was obviously influenced by the public architecture predominant in the Historic Capitol District in terms of size, scale, and texture.

In 1927, the Young Women's Christian Association building on Richards Street, across from Iolani Palce, was completed. This graceful, Mediterranean-style building was designed by the noted architect, Julia Morgan. The structure is compatible with the Historic Capitol District in terms of size, scale, and texture.

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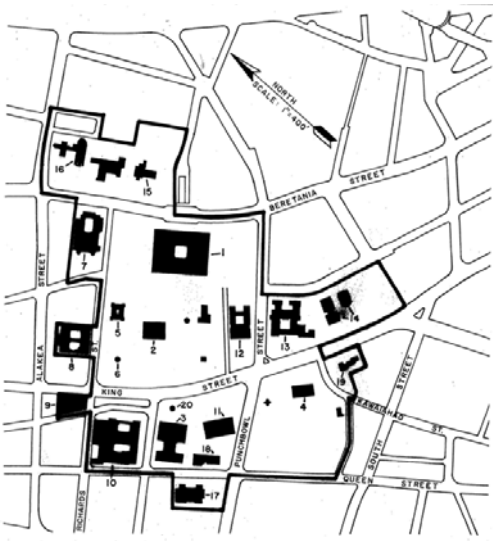
The Army and Navy Young Mens Christian Association building on the corner of Richards and Alakea was completed in 1928. It was built on the site by local architects Emory and Webb, and San Diego architect Lincoln Rogers. The Mediterranean-style structure is also compatible with public architecture in the Historic Capitol District in terms of size, scale, and texture.

The City and County of Honolulu's city hall building, "Honolulu Hale", was completed in 1929. Designed by local architects C. W. Dickey, Hart Wood, and Robert Miller, Guy Rothwell, and Marcus Lester, it reflected the current vogue in Mediterranean-style architecture.

Public and private construction has continued in the Historic Capitol District down to the present time. For the most part, the design of this construction has been such that the scale and texture of the district has maintained its historic character. Other buildings erected in the Capitol Historic District are: the State Tax Office, on Queen Street, across from the Kapuaiwa Building (1939), the Tax Office Annex (I'i Building), adjacent to the Tax Office (1950), the Mission-Historical Library building, makai of the Mission Houses Museum (1950), and of course, the State Capitol Building (1969).



HAWAII CAPITAL HISTORIC DISTRICT

* For number code see item number 7 page 2 of this form.

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SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC Kawaiahao Church and Mission Houses

AND/OR COMMON

2 LOCATION

STREET & NUMBER 957 Punchbowl Street; 553 S. King Street

__NOT FOR PUBLICATION

CITY, TOWN Honolulu

__VICINITY OF

CONGRESSIONAL DISTRICT

STATE Hawaii

CODE

COUNTY Honolulu

CODE

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE
__DISTRICT	__PUBLIC	X OCCUPIED	__AGRICULTURE X MUSEUM
X BUILDING(S)	X PRIVATE	__UNOCCUPIED	__COMMERCIAL __PARK
__STRUCTURE	__BOTH	__WORK IN PROGRESS	X EDUCATIONAL __PRIVATE RESIDENCE
__SITE	PUBLIC ACQUISITION	ACCESSIBLE	__ENTERTAINMENT X RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT __SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL __TRANSPORTATION
		__NO	__MILITARY __OTHER:

4 OWNER OF PROPERTY

NAME Kawaiahao Church/Hawaiian Mission Children's Society

STREET & NUMBER 957 Punchbowl 553 S. King

CITY, TOWN Honolulu, HI 96813 Honolulu, HI 96813 STATE

__VICINITY OF

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC. Bureau of Conveyances

STREET & NUMBER

CITY, TOWN Honolulu

STATE Hawaii

6 REPRESENTATION IN EXISTING SURVEYS

TITLE National Survey of Historic Sites and Buildings; Historic American Buildings Survey

DATE 1962

X FEDERAL __STATE __COUNTY __LOCAL

DEPOSITORY FOR SURVEY RECORDS Historic Sites Survey, Historic American Buildings Survey; Heritage Conservation and Recreation Service

CITY, TOWN Washington

STATE D.C.

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
X EXCELLENT	__DETERIORATED	__UNALTERED	__ORIGINAL SITE
__GOOD	__RUINS	__ALTERED	__MOVED DATE_____
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

Kawaiahao Church: Revered as the Protestant"mother church" of Hawaii, the building is of basilican plan with tetrastyle portico surmounted by a clock and belfry tower with castellated parapet erected over the narthex. It is constructed of indigeneous coral blocks in undulating range courses of approximately equal height.

Overall dimension: 143'-6" long by 78'-10" wide with eaves line approximately 35' above grade.

Foundations: Coral block with basement walls 44" thick to water table at first floor level. Exterior plastered with rough texture to water table.

Wall constructions: Walls to balcony levels are coral block 33" thick centered on basement wall, and above, they are 27" thick with 6" ledger on inside. Coral block routh cut to approximate equal height and variable length are laid with undulating range courses with applied mortar joints. Wall terminates with simple cornice of classic design at eaves line.

Portico and Tower: The main church entrance which is a tetrastyle portico of engaged austere stone doric columns and entablature, with center bay wider than side bays, projects slightly from the facade. This is surmounted by a belfry and clock tower with a castellated parapet erected over the narthex. A clock with a face approximately 12 feet in diameter on three sides of the tower below the belfry dwarfs the scale of the building. Clock face on fourth side over roof ridge is smaller in diameter. The belfry has one arched opening in each of four sides protected from weather by wood louvers. The portico is approached by a pyramidal range of concrete-faced coral steps terminating at a platform approximately 33 feet wide by 11 feet deep.

Doorways and doors: The main entrance doorway is a semicircular arched opening with cement plaster reveals set in the center bay of the portico and is approximately 7'-6" wide by 13' high. Double wood doors with raised panels and mouldings and a lunette fill the opening. This opening is flanked by similar but smaller semicircular arches and single doors in side bays of the tetrastyle portico.

Windows: All windows are modern replacements of anodized aluminum. Basement window openings are rectangular with variable head heights, windows at main floor are rectangular with dressed stone lintels and sash are awning type. Windows at balcony level are semicircular arched openings and awning type sash with muntins terminating in gothic forms in the lunettes. All windows have plaster reveals.

Roof Shape: Gable roof covered with slate shingles and supported by reinforced trusses and purlins exposed to the nave.

(CONTINUED)

8 SIGNIFICANCE

PERIOD

AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW

__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	__ENGINEERING	__MUSIC	__THEATER
X 1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	__TRANSPORTATION
__1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	X OTHER (SPECIFY) History of Hawaii
		__INVENTION		

SPECIFIC DATES 1838-42 (Church) BUILDER/ARCHITECT Hiram Bingham

STATEMENT OF SIGNIFICANCE[1]

Kawaiahao Church: The historical significance of Kawaiahao Church is indicated by the fact that it is often called "the Westminister Abbey of Hawaii." Outgrowth of the original Mission Church founded in Boston in 1819 and of the first foreign church on Oahu, it symbolizes the work of the Protestant missionaries, "one of the motivating forces in the life of Honolulu and the Islands." As the state church, it was the scene of many celebrated events--inaugurations, funerals, weddings, thanksgiving ceremonies--associated with the Hawaiian kingdom. Although not the oldest surviving religious structure in the islands, it, as the church founded and designed by the Rev. Hiram Bingham, seems to be the most important and representative church of the Protestant missionary period. The Kawaiahao Church, the old adobe schoolhouse on its grounds, and the three nearby "Mission Houses," form a group of structures which seems best to illustrate the influence of the American Board missionaries upon Hawaii.

Its interest in Hawaii aroused by accounts of New England mariners and by Hawaiian youths who had reached the United States and been converted to Christianity, the American Board of Commissioners for Foreign Missions decided in 1819 to expand their work to the islands. A Hawaiian Mission Church was organized in Boston during October, 1819, and almost immediately thereafter a missionary party of 17 members under the direction of the Rev. Hiram Bingham and the Rev. Asa Thurston, set sail in the brig Thaddeus. The group, less a contingent dropped off at Kailua, landed at Honolulu on April 19, 1820. Four days later Mr. Bingham preached the first formal Protestant sermon in the islands. The missionaries on Oahu were first assigned land near the Nuuanu Valley, but the king suddenly allotted them instead a tract on the duty plain near Honolulu near a spring known as Kawaiahao. The "Hawaiian Pilgrims" took up residence there in thatched houses, a part of one dwelling serving as "the first foreign church on Oahu." This meeting room also served as a school on week days, and here was begun the educational work which was to make 80 per cent of the Hawaiian population literate within four decades--a remarkable achievement with far-reaching effects upon the development of the islands.

The congregation soon outgrew the first room, and in 1821 a thatch-roofed, wooden church, 54 by 22 feet in size, was built a short distance toward the sea from the

[1]The statement of significance is taken from John A. Hussey, National Survey of Historic ites and Buildings (NSHSB) form, "Kawaiahao Church," July 19, 1962, Records of the Historic Sites Survey, Heritage Conservation and Recreation Service (HCRS).

(CONTINUED)

9 MAJOR BIBLIOGRAPHICAL REFERENCES

(SEE CONTINUATION SHEET)

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY Ca. 8.8 acres

UTM REFERENCES

A [0,4] ZONE [6|1,8|1,7,0] EASTING [2,3|5,6|5,8,0] NORTHING

B ZONE EASTING NORTHING

C

D

VERBAL BOUNDARY DESCRIPTION

(SEE CONTINUATION SHEET)

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE
Benjamin Levy, Historian

ORGANIZATION Historic Sites Survey Division, Heritage Conservation and Recreation Service — DATE August 1978

STREET & NUMBER 1100 L Street NW. — TELEPHONE 202-523-5464

CITY OR TOWN Washington — STATE D.C. 20240

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

FEDERAL REPRESENTATIVE SIGNATURE

TITLE — DATE

FOR NPS USE ONLY
I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE 2/22/80

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

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Kawaiahao Church and Mission Houses
CONTINUATION SHEET ITEM NUMBER 7 PAGE 2

Technical Description of Interior:

Floor Plan: Basilican church plan with one aisle on each side and a balcony in the manner of contemporary New England churches, whence the missionaries came. Five square plaster finish columns range down each side of the nave at the face of the balconies surmounted by a run-plaster entablature. The balconies step down between columns toward the sanctuary.

Sanctuary: The alter reposes on a dais five steps up from the main floor, protected by a railing, approximately 16 feet ewa of the rear wall. The reredos of panelled wood erected between large arched windows in the Waikiki wall of the church shealds the sacristy.

Pews: Pews of redwood are arranged for center aisle and side aisles which are along outside of the nave columns. The upholstred Royal Pews located at either side of main entrance against the ewa wall are handsomely guarded by panelled Koa wood railings and back boards.

Stairways: Stairways of reinforced concrete occupy the mauka and makai corners at either side of the narthex and lead to the balcony. That on the mauka side, also, leads to the basement.

Choir Loft: The choir and organ loft occupy the balcony across the ewa end of the nave and the tower room.

Site:

General setting and orientation: Church is set in a walled enclosure at the Waikiki-makai corner of Punchbowl and South King Street with church entrance to ewa. Surrounding area is landscaped with native plantings. At the rear of the church is the original Mission Cemetery and makai of the Punchbowl Street entrance is the Gothic tomb of Lunalilo.

Enclosure: The 6 foot high coral block wall erected around the church site ca. 1875 was reduced to 2 feet in 1899 to avoid repetition of the Wilcox revolution of 1889 when Honolulu Rifles fortified themselves on the church grounds and commanded the makai portion of the Palace grounds.

Lighting: Electric illumination was installed in 1893 replacing lamps, two of which fell in 1894 and started fires.

Heating: In the balmy climate of Hawaii no heating is required.

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Condition of Fabric: In excellent condition as, due to termite destruction, building has been resotred and altered several times since first erected 1838-42. It was completely reconstructed 1925-27, when all structural wood was replaced with reinforced concrete and steel and interior redesigned. The latest restoration was in 1965 when the exterior cement plaster applied in 1927 was removed, metal windows installed, and termite damaged wood work repaired.

Alterations: In 1867 to prepare for the installation of an organ to replace the melodion, the pulpit was moved forward some twenty or thirty feet nearly to the center of the auditorium, and a new choir loft built behind the pulpit. The new area was partitioned into Sunday school rooms. In 1873, just prior to King Lunalilo's unauguration, the church was renovated including installation of new coconut mats and securing the galleries with iron bolts to improve their safety. About 1885 a legacy from Mrs. Bernice Pauahi Bishop was used to remove the small steeple, "an absurd wooden spire," blunt and without much visual attraction. In addition, the Bishop funds were used to build up the tower with coral stone to give it the square tower its present height.[1] In 1895 electric lighting was installed. At the same time a renovation was carried out involving the replacement of the wooden tie beams which were badly termite eaten. The interior was refitted and repaired.

In 1925 the building was almost entirely reconstructed. All interior wood was termite infested. All wood was removed leaving only the coral walls standing and the building was rebuilt from the basement up. The auditorium was restored to its full length, the galleries were widened and extended. Concrete pillars provided an aisle effect within. The reconstruction attempted to return the building to its original New England simplicity. The pulpit, with furniture made from salvaged ohia slabs and kauila logs, was designed with wide steps leading up to it and a simple cross on the wall behind. The original arched windows on either side of the pulpit and the crescent opening above the cross were retained. New, insect-proof redwood seats were installed, and the old royal pews were closed to visitors. The roof was covered with imported slates, put on with copper nails. The outer walls were spray-coated with a cement plaster to preserve the coral blocks from damage by birds pecking at them. Inside, a new organ, funded in part by C. Brewer and Co. to commemorate their 100th aniversary, replaced the 1901 instrument. For the new, longer hall, an

[1]National Survey of Historic Sites and Buildings form prepared by John A. Hussey, July 18, 1962, in the files of the Historic Sites Survey Division, Heritage Conservation and Recreation Service (HCRS).

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echo section was donated by the organ manufacturer. The organ was placed in the ewa (tower) end of the building. The display pipes are visible, but the music mechanism was enclosed in four concrete rooms.

To complete the new setting, the grounds were replated - little had been done since Lunalilo's time, except in 1899 when A. S. Cleghorn pulled down the high wall, dug an artesian well, planted a lawn, and set out the line of royal palms mauka of the building as memorial to his daughter, Princess Kaiulani. A fountain pool was built with some coral block to commemorate the old spring at King and South Streets which had given the land, and the church, its name: Ka wai a Hao - the water of Hao.

In 1965, Kawaiahao underwent additional refurbishing by way of repainting and repairing the interior, repairing the slate roof, replacing the windows, and removing the 1927 cement finish from the exterior coral blocks but only to the base. Outside, the grounds were replated and the fountain rebuilt. Other improvements were planned for the future.[2]

In 1976-77 the drainage was improved by connecting the leaders to a dry well. Wainscoting and roof were repaired, the copper ridge flashing replaced and the tower reroofed. In addition, the pews and altar were refurbished, the interior painted, and continuing maintenance performed.

Frame House:[3] The mission frame house stands on the mission grounds near Kawaiahao Church on King Street. It was one of the first frame buildings to be constructed in the Hawaiian Islands. The timbers of Maine white pine were cut and fitted in Boston in 1819 and came around the Horn on the brig Thaddeus with the pioneer mission company in April 1820. The frame of the house arrived on Christmas morning of that year on board the ship Tartar.

GENERAL STATEMENT

Architectural interest and merit: One of the most interesting architectural facts about this particular structure is its literal New England origin.

[2]Description of the building and the alterations is taken primarily from "Photographic-Data Book Report," Historic American Buildings Survey record file HA-14, "Kawaiahao Church" prepared by A. Lewis Koue, FAIA, February 1967.

[3]The description of the frame house is taken from the Data Sheets filed with the HABS, file HA-21, "Mission Frame House," prepared by Woodrow W. Wilkins, August, 1967. The file contains copies of the HABS field notebooks which have detailed measurements and floors. These are included here by reference as are the series of photos including copies of historic photos and sketches.

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Lumber for this New England plan type was actually pre-cut prior to shipment around the Horn. It may be considered in a broad sense, therefore, a very early example of prefabrication. It also has the distinction of being one of the first wood frame houses in the islands. Architecturally, it simple and straight-forward expression, the relatively low ceilings, and basement are strong evidence of its New England concept, alien to the temperate climate of Honolulu.

Having been restored in 1935 and maintained by a dedicated group of descendants of the early missionaries for whom it was built, it stands in good condition.

DETAILED DESCRIPTION OF THE EXTERIOR

This existing house consisting of two stories plus a basement measures 40' - 3 1/2" in length and 24' - 2 1/2" in depth excluding the kitchen wing which extends the basic rectangular plan on the right rear (ewa-makai) by 20' - 1 1/2". The overall height from grade to roof peak is 23' - 7".

Foundations: The boundation wall varies from 9" to 1' - 2" in thickness, except on the left (Waikiki) side where it becomes an average of 1' - 10" and where a now demolished wing once stood. The walls are adobe brick set in a mud mortar. Reinforced concrete buttresses were built against the inner surfaces in the basement in the 1935 restoration. In addition, irregularly square piers of coral rock support interior beams. There is a display panel which exposes the adobe brick in the transverse interior bearing wall at the left (Waikiki) end of the basement.

Structural system: According to an article in the Friend, September, 1935 (see appendix A) by Mr. Dickey, Architect for the 1935 Restoration, all wood framework was replaced with termite-proof wood. The article further states that original siding, flooring, doors, window, cupboards, etc., which was retained was individually treated and re-used. Mr. Dickey also installed steel beams cased in wood to early floor loads as well as a reinforced concrete perimeter beam on the exterior walls.

The semi-round roughtly-squared timbers of the roof rafters and beams may possibly be original or re-used.

Porches, stoops, bulkheads: There are two sets of coral rock stoops on the King Street (mauka) elevation and one stoop of the same material on the rear (makai). The latter is not aligned axially with the stoop at the main entrance, but rather with a window. There is no protective roof at either.

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There is also a small two-story wood framed porch on the right side (ewa) of obvious latter date.

There are, in addition, coral rock bulkheads at both the front and rear, which enclose a coral rock stairs to the basement.

Early photographs in the Mission Society Library indicate there have been at least three different porches on the front (King Street).

Chimneys: The single chimney which is at the end of the kitchen wing is of coral rock and brick, plastered on the exterior with cement stucco. It is 15 feet high. The arched head of the opening is supported by two 2" wide curved iron straps, bent so horizontal legs are built into the masonry side walls of the fireplace. A hanging pot crane is also built in. The hearth is stone.

Openings - doorways and doors: The three exterior doors on the ground floor are all treated similarly with plain unmoulded trim. The two exterior doors to the basement are set into the basement walls without trim. A ventilating transom covered with wire mesh is set over these basement doors. On the King Street front (mauka), the wood door is 6-paneled; on the rear (makai), there is a 2-light transom over the 6-paneled door; the door on the porch on the east (ewa) is a dutch door of vertical boards on the exterior fastened to horizontal boards on the interior; the kitchen door is also Dutch, consisting of two wide vertical boards, braced on the interior with horizontal rails. The two basement doors are also vertical planks.

Windows and shutters: The majority of the windows are 6/6 wood double-hung, using iron pins instead of sash weights. Exceptions are a fixed six-light window on the second floor, a 6/6 sliding wood window and a six-light fixed wood window in the kitchen. The smaller window openings on the second floor have adjustable wood louvered shutters without windows.

Roof - shape, covering: The gabled roof over the main house and the kitchen are both covered with asbestos shingles.

Cornice, eaves: The cornice board is a simple flat band with a narrow moulding at the top.

Dormers: There is a wide gabled dormer with a single louvered window on the front (King Street), with the plastered ceiling on the interior being arched.

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DETAILED DESCRIPTION OF THE INTERIOR

The Basement in plan consists of one room on the left (Waikiki) and a larger space on the right. The latter is divided by a stud portion and large square plastered stone piers. Access is by an exterior coral stair on both the front and rear and an interior concrete stair leading down from the kitchen. All walls are plastered, the floors are brick and the ceiling exposed wood.

The first floor plan which has been altered by both additions and demolition (on the left) consists of two rooms across the front. A smaller room and stairhall are located behind the front room on the left. The room on the left extends through the depth of the house, and connected by a doorway to the kitchen wing on the rear, and one to the covered porch on the right. The rear part of this porch has been enclosed. There is also a stairway leading from this large room up to the second floor.

The second floor consists essentially of two large rooms separated by a stair-hall. Under the eaves on each side smaller rooms have been partitioned off. In the right rear corner there is the second stairway down to the large room below.

Stairways: When the house was first enlarged, the original stair way was relocated and the second stairway in the rear right corner was added. Both stairs are ell-shaped with winders. Both are enclosed except for the wood balustrade at the head of the centrally located stair.

Flooring: The floors are brick set in earth in the basement, cement in the kitchen and random width boards in the first and second floors.

Wall and ceiling finish: Walls are plaster on adobe brick in the basement, plaster on coral rock in the kitchen and plaster on wood framing in the first and second floor. There are also two painted plank partitions on the second floor. Ceilings are exposed wood framing in the basement and kitchen and plaster in the main house.

Doorways and doors: Several types of doors are found in the house. Some are 4-panel on either one or both sides and others are 6-paneled on one side only. There is also a cased opening in the left front room. Doors in the small built-in cupboards are also paneled.

Decorative features and trim: The base boards are all flat unmoulded. Door and window trim is simple with small framing moulding. The rooms downstairs and the major rooms upstairs have narrow moulded chair rails and picture rails. Wood clock shelves are also installed.

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Notable hardware: Door latches are of two general types: the flat door pull and thumb latch, and the more decorative spool handle with scalloped escutheon plate. There are also several sliding lock bolts surface mounted.

Lighting: None.

Heating (fireplaces): The only fireplace is the stone fireplace in the kitchen. The opening is slightly arched. A swinging pot crane is embeded in the inner rock walls.

SITE AND SURROUNDINGS

Orientation and general setting: On the south side of King Street, the Mission Frame House is on the left (Waikiki) side of the Mission Printing Office, one of the three mission buildings on the property.

Outbuildings: Adjacent in the rear is a small frame structure containing rest room facilities.

Landscaping: The three Hawaiian Mission Children's Society's buildings are set back from King Street on a grass lawn, enclosed by a low coral rock wall with iron gates.

Typical plants, trees and shrubs are informally scattered on the lawn. Some of these are the Banana tree, Royal poinciana, Pili, Ti, Hibuscus, and the Octapus tree.

Alterations: Other than changes cited above, the fundamental alterations in the building were successions of internal partitioning which were done to accommodate more inhabitants than the building was designed to house. In 1828, an addition, 15 1/2 by 17 feet was attached to the east end of the house to serve as a bedroom for the Bingham family. This addition was removed years later. In 1829 the roof was extended to provide for another upstairs room. No record of either extensive repair or alteration has been found for the period 1830-1907.

In 1904 at a meeting of the Hawaiian Mission Children's Society, also known as the Cousin's Society, it was suggested that the mission frame house be obtained as a home for the Society. In 1906 the house was sold by A. F. Cooke to C. M. Cooke, Ltd. In 1907 Mr. Charles M. Cooke offered to leased it to the HMCS for twenty years at a dollar a year with the idea that if they were interested enough to keep it in good condition it might ultimately be ceded to them as, in fact, it was in 1925. A committee was appointed to look into the condition of the house. Several contractors were called in to examine the

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building which was found to be so badly eaten by insects as to be considered beyond repair. Various suggestions were made for restoration, such as an inside steel frame to hold the house up or the injection of liquid cement into the timbers, but hhe cost was prohibitive. After considerable study the HMCS committee submitted their report, recommending extensive repairs to restore the house to its original appearance. The cost of these repairs when completed was approximately $1500. The details of the renovation are contained in the HMCS Minutes of the Board of Managers meeting January 23, 1907:

> "That the building be made water right at once, and those sills and beams which, upon examination, prove to be rotten be replaced; that the partitions lately placed in the building be removed and the house restored as to its original conditions as far as possible; that the plastering be repaired; the floors renewed and the room repapered; that the roof be re-shingled with shingles dipped in oil; that the kitchen be re-slated, it now consisting partly of shingles and partly of slate, ...that all the old hardware be preserved or replaced; that window casing be put in to slide in the sills as appears to have been the original method; that all the medicine and book shelves be retained; that a new front door similar to others in the building be made and put in place; and that the exterior of the building be painted." This cost for these repairs was estimated.[4]

In 1925 when the HMCS gained title to the house, the premises were again inspected and again extensive insect damage was found. A. E. Arledge, who inspected the house, advised that the first floor was unsafe for more than six people in any one room or concentrated location, but it could easily be strengthened by studding and shoring without removing any of the old timber. This would make the house safe for three to four years and cost about $150. But Arledge urged that permanent repairs be considered. It was another ten years, however, before funds could be raised for a complete restoration, but the need had been seen and several plans were discussed in the meantime. In April 1930, C. W. Dickey, Architect, submitted specifications for constructing an inner concrete shell around which the original wood frame and interior could be placed. Dickey estimated the cost at about $6900, but pointed out that this would be fireproof, insured against insect damage, and the original

[4]Ibid., p. 9.

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exterior appearance of the house would be retained. This plan was not approved, however, for it was felt that the concrete shell would make the walls too thick and destroy the original proportions of the house.

By 1935 the HMCS was able to procure sufficient funds to completely renovate and restore the frame house. C. W. Dickey was again consulted and his specifications for the work were submitted in September 1934. His plan was to retain the original thickness of the walls, partitions, and floors as well as original clapboards, doors, windows, cupboards, and shutters, but to replace the wood framework with termite-proof lumber. Detailed photographs of every room were taken before the work started. As a result, the house looks exactly as it did before, both inside and out, but it is strong and well built.

Since 1935 various minor repairs such as repainting and some replastering have been undertaken. Today the old mission frame house is maintained by the Hawaiian Mission Children's Society as a memorial to the early missionary effort in the Hawaiian Islands. Momentoes and furniture of the first mission families are displayed in the house, together with photographs of the men and women who lived and worked there.[5]

Adobe Schoolhouse:[6]

General: The building has good, simple lines. Today, it is a unique example of Hawaiian adobe wall construction.

Condition of Fabric: Generally good. Original thatch roof long gone; roof line was probably lowered when shingles were substituted. All woodwork seems to be modern.

EXTERIOR

Number of Stories: One.

Shape: Original outline a simple rectangle; new (c. 1965) wooden addition at rear slightly wider.

[5]More detail, including footnotes and specific data on the alterations, is contained in the HABS file which is included here by reference.

[6]Description of the schoolhouse is taken from the Data Sheets filed with HABS, File HA-19, "Adobe Schoolhouse," prepared by Charles E. Peterson, FAIA, September, 1967.

(CONTINUED)

Overall Dimensions: 30' - 8" x 54' - 9 1/2".

Foundations: Not revealed.

Walls: Indoors, a panel opens to reveal original adobes 6" wall height and 1' - 6" long. The wall thickness is (plaster face to plaster face) 2' - 9".

Finish: Rough sand plaster, tan color. A hole in outside plaster reveals that it was applied to wire lath with an air space outside of adobe blocks.

Front Stoop: A low concrete stoop at front door.

Chimneys: None.

Front door: Modern double door hung in a light wooden frame.

Windows: Wooden double-hung sash of 8" x 10" lights, 9/6. The frames are set in recesses with arched heads - inside and out. Masonry sills seem to be of concrete. Modern wire insect screens hung from top.

Roof: Low hip roof covered with wood shingles.

Cornice: Shallow box cornice with plaster soffit and screened vents.

INTERIOR

Floor Plan: The original adobe section is in one room. A kitchen and small meeting room occupy the rear modern addition.

Stairways: None.

Flooring: Concrete.

Walls and Ceilings: Inside plaster wall appears to be furred out about 4" from adobe walls. Ceiling height: 10' - 10". No trim except low concrete baseboard.

Miscellaneous: No decorative features, hardware or lighting fixtures of interest. No heating arrangements.

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SITE AND SURROUNDINGS

Orientation: Normal to King Street.

Outbuildings: None.

Landscaping: No enclosures. Simple landscape plantings of recent date. Building open to street on one side and to the Kawaiahao church grounds on the other.

Alterations:[7] The Old Mission Schoolhouse, as this adobe building is also known, was first used for the mission's General Meeting of April, 1835. It had been built over the preceding two years, as adobe bricks, lumber and time were available, to replace an earlier straw school and meeting house on the same site. The new building was 24 x 40 feet inside, with walls 12 feet high and 30 inches thick, built in two tiers of brick with a space between. Each long side had four deeply recessed windows; there was a single window at the back end (later made into another door) and a wide double door with two windows facing on the street side. The adobe blocks were covered with clay plaster and lime whitewash, patted on by hand so the palm and finger marks showed. There was no floor or ceiling, and the roof was pili-grass thatch. The same furnishings served for both school and meetings: unpainted soft pine benches about 8 feet long, with a sloping desk attached to the back and a shelf below for books and slates. The soft pine was especially tempting for young whittlers. These benches, with a central aisle, filled most of the room; a long bench ran across the far wall and a table for the teacher or meeting chairman occupied a space between. The whole had cost approximately $700, mostly in donations, including gifts from King Kamehameha III and his adopted son, Alexander Liholiho (Kamehameha IV), who attended the official dedication in 1836.

By 1920, the building was a bad repair, with a roof almost gone and the woodwork termite-ridden. As part of the Mission Centennial that year, the HMCS, which had leased the property from Kawaiahao Church, had the building repaired and restored. The work included a lath and plaster shell over the old adobe walls, with a flat cement stucco outside finish. A concrete floor with wooden covering and a wooden ceiling were installed. The repaired building was then leased to the Free Kindergarten and Children's Aid Association for use as their headquarters. Over the years the Kindergarten Association made other changes,

[7]History of modifications taken from Data Sheets (HABS), File HA-19, "Adobe Schoolhouse," by Frances Jackson, September 1966.

(CONTINUED)

including electricity, plumbing and general repairs and obtained a new lease direct from Kawaiahao Church. This lease arrangement lasted until 1961 when the church found it necessary to retain the building for its own use.

In the 1940's, the building underwent a second rehabilitation when it was found termites had badly destroyed the woodwork of the 1920 restoration. The walls were reinforced with steel lath and again the inner and outer walls were plastered with stucco. The roof was rebuilt and extended, and reshingled with fireproof asbestos shingles. (Shingles are now wood on a light frame; no sheathing to indicate possible asbestos shingles.)

In 1966 the building is standing idle. There are plans for properly restoring the Old Mission Schoolhouse as part of the Kawaiahao Church and Mission Historical Houses National Historical Landmarks. It is the only remaining building in Honolulu with all four walls built of adobe bricks. The building is used as a meeting room for the smaller church groups. Plans schedule restoration for 1979.

Chamberlain House:[8] The simple form of the building, with cellar, two stories and an attic, is similar to houses of the same period in New England. The massive exterior walls are built of coral blocks set in lime mortar.

SITE

The house is prominently located, set back from the streets on an irregularly shaped tract approximately 1.1 acre in size. Other buildings on the site include the wood Frame House, the First Printing House and the recently-constructed Mission-Historical Library. On the property line adjacent to the streets there is a three-foot wall of coral stone.

EXTERIOR

Overall Dimensions: The two-story major portion is 26' - 8" by 54' - 9" with a rear two-story wing 16' - 6" by 22' - 2" in size.

Foundations: Basement and foundation walls and intermediate piers are of coral stone, rough, unplastered.

[8]Description taken from the Data Sheets, HABS HA-4, "Chamberlain House."

(CONTINUED)

Wall Construction: Thick masonry exterior walls are of coral stone surfaced with an exterior cement plaster finish simulating stone with wide joints. Exterior gables are finished with siding, now asbestos, probably originally wood siding.

Porch, etc.: On the south corner adjacent to the kitchen there is a one-story porch and a latticed enclosure.

Chimney: The chimney flue is within the wall of the kitchen. Above the roof the chimney is built of brick.

Doorways and Doors: Steps and stoops at entrance doors are of coral stone. Exterior doors are deeply recessed. Two glazed window-doors in the cellar provided access for supplies through the light wells.

Windows: Small windows in the cellar are barred, no glazing. Windows on the first and second floors are double-hung wood sash.

Roofs: The main portion and the rear wing are ridge roofed with gables. The present roofing is composition shingle over wood sheathing.

Alterations: A detailed account of the structural history of the building has not been located. Hussey reported in 1962 that in 1919 the house was "completely renovated" but apparently little altered.[9] A detailed description of the interior of the house as of 1895 is contained in the HABS file. It was carried by the Pacific Commercial Advertiser on March 9, 1895.[10]

Print Shop:[11] The Mission Printing Office represents a purely utilitarian structure, built to house the first printing press in Hawaii.

[9]John A. Hussey, NSHSB form "Mission Houses," July 19, 1962. A report by Frost and Frost was recently (8/29/78) indicated to be filed in the Hawaii Mission Children's Society Library, Honolulu. This report, it is said, discusses the changes.

[10]HABS file HA-4 also contains photos of the house taken July 1966 and photocopies of early prints and sketches.

[11]Description taken from HABS Data Sheets, "Mission Printing House," prepared by Woodrow W. Wilkins, August, 1967, in the file HA-20. That file also contains photographs taken in July 1966 by Jack E. Boucher and field notes by R. K. Yomomoto and Ron Saiki, July 10, 1967.

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Condition of Fabric: Although there has been some efforts in the recent past to stabilize the structure, there seems to be serious progressive deterioration of interior plaster and exterior mortar. Both are rapidly drying out to the point ot pulverized powder. The building was restored by Frost and Frost. Exterior coral was painted. There was a considerable amount of efflorescence on the interior walls at the time. Now appreciably improved since the repainting. Gutters were added and new roof installed.

DETAILED DESCRIPTION OF EXTERIOR

This is a simple one story rectangular building measuring 29' - 10" x 18' - 8", excluding 5' - 1" porch (lanai).

Foundations: Not accessible but presumed to be coral rock similar to the bearing walls.

Wall construction, finish, color: Walls on the King Street (mauka) and right (ewa) sides consist of natural coral rock in random sizes set in heavy mortar joints which average 3" - 4" thick in the horizontal and 4" - 8" widere vertically. The rear (makai) and left (Waikiki) walls are finished smooth in modern white cement stucco over the coral rock. (In 1978 this is no longer true.) Coursing on the front wall is more regular than on the ewa wall. (1978 the wall is exposed coral rock with paint on the exterior.)

Structural system, framing: The modern roof is framed with 3" x 4" roof rafters, 3' - 0" o.c. with 3" x 3" purlins, irregularly spaced, which carry the galvanized corrugated roofing directly. Diagonal and vertical braces are 1" x 4".

Porches, stoops: A continuous lanai (porch) extends along the King Street (mauka) side of the building, roofed by a continuation of the main roof slope, and supported on the edge by four 4" x 4" posts. Early photographs (1889) show several more posts in a different bay arrangement, and also the fact that the porch was extended to connect to the Mission Frame House on the left. These photographs also indicate a wood floor, since replaced by smooth finished concrete. There are two coral rock steps from grade in the center. On the rear (makai) side a detached shed roof covers a modern concrete walk with a coral block stoop up to finished floor level. (In 1978 this feature is no longer present.)

Chimneys: None.

(CONTINUED)

Openings - doorways and doors: On the front (mauka) there are two doorways - one in the center and one to the right (ewa). It is quite possible that this latter doorway was originally a window. A timber lintel is set in the stone work over the openings. Door trim, flat jamb and head, is set flush with the stone wall and is obviously of recent installation. There is no sill at the cement step up to floor level. Within the full width of the opening above the door there is an open wire covered ventilator 6 3/8" high. A similar doorway is in the center of the rear (Makai) wall. All doors are 6-panel wood, 1 1/4" thick with horizontal rails tennoned into stiles.

Windows and shutter: The window sash are wood double hung with iron pegs instead of sash weights to control opening. On the front there are 12/8 lights of 8" x 10" glass, and on the rear 6/6 lights with 7" x 9" glass. The exterior wood sills are let into the stonework similar to the head. The sills on the interior are concrete.

There are no shutters although the 1889 photographs shows shutters at the central doorway and also at the window to its left. There remains two bracket pintles in the right jamb of this window. (In 1978 building shows wood louvers in the gabled ends.)

Roof - shape, covering: The gabled roof is presently covered with galvanized corrugated iron which appears also in a 1915 photograph. A 1906 photograph shows a shingle roof which may be wood or slate, therefore the present roofing material dates between the 1906 - 1915 period. (Re-roofed in 1965.)

Cornice: A flat 6" fascia serves as a cornice on the gabled ends.

DETAILED DESCRIPTION OF THE INTERIOR

Floor plan: The interior consists of two rooms, each having a cupboard built into the stone walls. The dividing partition also contains a cupboard framed together with the doorway. A recent exploratory dig near the doorway discloses a new 4" x 4 5/8" lintel over the doorway, a recent replacement. It has not been possible to determine whether this coral partition is original or a later addition.

Stairways: None.

Flooring: Modern smooth finished concrete.

(CONTINUED)

Wall and ceiling finish: The walls and ceilings are white plaster which is 1" thick at the exploratory holes. Plaster is finished up to the wood trim at the openings.

Doorways and doors: The single doorway and cupboard are framed into one large opening in the room on the right (ewa). The jamb and head trim is modern. The door has been removed.

Decorative features and trim: There are no decorative features. The exterior angle at the intersection of the plastered reveal and the wall is covered by a moulded wood trim piece.

Notable hardware: None.

Lighting: Modern electric.

Heating: None.

SITE AND SURROUNDINGS

Orientation and general setting: On the south side of King Street, the Printing Office is closely set between the Mission Frame House on its left (Waikiki) and the Chamberlain House on its right (ewa).

Out buildings: None.

Landscaping: The three Hawaiian Mission Children Society's buildings are set back from the street on a grass lawn, enclosed by a low coral rock wall with iron gates.

Typical plants, trees and shrubs are informally scattered on the lawn. Some of these are the Banana tree, Royal poinciana, Pili, Ti, Hibiscus and the Octapus tree. Coral stepping stones are set in the lawn.

Alterations:[12] Between the two mission houses on land given by King Kamehameha II to the first mission company as a homesite, stands the old Mission Printing House. Constructed in 1823, it is reputed to be the first printing house west of the Rocky Mountains.

[12]The structural history of the building is taken from Karmen Tiahrt, Data Sheets, August, 1967, HABS file HA-20.

(CONTINUED)

The pioneer Mission company to the Hawaiian Islands brought their Ramage printing press around the Horn in 1820 and when it was unpacked in Honolulu in August of that year, it was found to be undamaged. Temporarily the press was housed in a thatched house belonging to the Mission family. However, when wind blew the roof of the hut off, the press was taken into the home of the Loomis family where it was again set up. There on January 7, 1822, the first public printing was done on the press with Governor Keeaumoku taking off the first sheet. Printing was continued for several days in February 1822, but operations were then suspended until a permanent home for the press could be provided.

By the end of December 1822 construction of a printing house was underway. The work was done by members of the Mission company stationed in Honolulu with, no doubt, some native assistance. Some sources credit Daniel Chamberlain as chief builder of the printing house as he had begun the construction. However, Chamberlain left Hawaii in March 1823 and other men, particularly Elisha Loomis, who was in charge of the press, and Levi Chamberlain, who arrived in April 1823, seem to have taken charge of the work. As there was a distinct "want of beams, plank, boards, and shingles," it was decided to use coral stone for the building material. The coral was easily obtained in abundance near the vicinity of the mission houses at a depth of a few feet from the surfact of the ground. The coral was "laid in mortar of the common soil." Fortunately, the mission was able to purchase the hull, bowsprit and two masts of the wrecked whaling ship Ruby to use in building the printing house, a dwelling house and for fuel. By August 1823, the Mission could report that they had "Completed the walls of the printing house which when covered will be ready for use. The building has cost 250 dols, and will probably require 50 more to complete it ... the dimensions are 28 feet by 17 which will afford room for two presses with their variety of apparatus."

It had originally been proposed to make the building fireproof by covering it with tile ordered from Canton. However, the decision hinged on two considerations - if the tiles could be procured at a reasonable cost and if a person could be found who understood fitting them on. By the end of August 1823 the decision had been made and tiles from Canton had been ordered to cover the roof. There is, however, no record that such tiles were actually received or used. At the same time glazed windows for the printing house were requested from the Mission Board in Boston.

By November the building was nearly complete and shingling of the roof was begun on November 5. The mission report noted that "we are obliged to make our shingles in part of bits of thin boards rived and hewed with a hatchet by the natives of the Northwest coast." Elisha Loomis, however, records that the mission had to saw their own boards and split the shingles.

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The roof was finished in about three weeks, by November 22. The inside walls were quickly covered with tapa pasted on with poi. Perhaps this did not prove very satisfactory, for less then a year later, Mr. Loomis was investigating the possibility of laying over the inside of the printing house with plaster made of "lime and a peculiar kind of clay called pohu found near the Pearl River.

By December 2, 1825, the printing house was complete and Mr. Loomis moved in and set up the press. A few days later he began printing an edition of Hawaiian hymns.

It would appear that even this printing house did not prove satisfactory for long. Two years later on December 26, 1825, Mr. Loomis wrote to the Mission Board that "our present printing office being much too small, we have commenced building an addition to it of some 30 x 19 feet and two stories high." The building referred to by Loomis may, however, have been built across the street, rather than as an addition to the original printing house as there is no other confirmation of such an addition being constructed.

After 1825 there is an almost total lack of records concerning the mission printing house, and any repairs or alterations made to it. It appears that it was used for twelve years by the Mission printers and was them associated with the frame house standing just adjacent on the Waikiki (left) side of the building. In a letter of November 14, 1844, from Levi Chamberlain to the Mission Board, he speaks of the building as serving both as a storehouse and a dwelling, being united to the frame house by low buildings. According to the remembrance of a member of the Hall family in 1907, her parents, the Halls, lived in this building and she was born there in 1842. In 1851 the printing house together with the frame house came into the possession of the Cooke family. It is not known what use they made of the building, but as they kept several boarders in their home, it is possible they may have used it for their accommodation. According to a friend of the Cooke family, Mrs. A. S. Cooke continued to live in the buildings until 1880 and for perhaps eight years after this it was occupied by other family members and friends. It then stood unoccupied for several years.

Interest in preserving the frame house as a relic of the early mission days in Hawaii led to the acquisition of this building together with the printing House in 1907 by the Cousins Society, officially known today as the Hawaiian Mission Children's Society. Mr. Charles M. Cooke had offered to lease the buildings to the Cousins for a dollar a year with the idea that if they were interested enough to keep them in good condition, they might ultimately be ceded to them as, in fact, they were in 1925.

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The HMCS committee appointed to investigate the condition of the mission buildings found the printing house to need few alterations. "Your committee believes that this building with comparatively little expenditure can be made almost fireproof by the building of a new roof of slate instead of shingles and with all the supporting timbers covered with tin. (Later on in the rear of this building, a fireproof vault can be built.) The total cost of this work will be in the neighborhood of $2750." This cost estimate seems to include $15000 needed for the frame house. There are no records to indicate that the alterations recommended by the committee were completely carried out.

After its renovation the printing house became the office of the HMCS in 1908 and served in this capacity until 1950. Apparently before the Society moved in, a cement floor was laid and shelves were built to hold the reports and papers of the group. The walls were also freshly cemented and plastered and the building was considered to be insect-proof.

The only records concerning repairs and laterations to the printing house in the ensuing years are for minor work such as painting, replastering and repairs for insect damage. The printing house today is used as a museum; a replica of the first printint press and its print work are displayed in the building along with other memntos from the early mission family.

Mission Cemetery: The cemetery is located between the Kawaiahao Church and Kawaiahao Street. Because of its association with the church and mission it is included in the landmark as a contributory element.

King Lunalilo's Tomb:[13] This small mausoleum was erected according to the will of King Lunalilo to house his remains. Its architectural merit is twofold. Besides being one of the few Gothic Revival structures on the island of Oahu, it is one of the earliest constructions in concrete block in America.

Condition of fabric: Although structurally sound, peeling paint and pitting off the exterior finish is visable. On the interior, there is evidence of a leak in the upper left (Waikiki-makai) corner.

DETAILED DESCRIPTION OF THE EXTERIOR

The single-story building has a cruciform plan with an exterior porch extending beyond the entrance towards King Street (the mauka side). The over-all exterior

[13]Description is taken from HABS Data Sheets, file HA-15, prepared by Woodrow W. Wilkins, June 5-7, 1967.

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dimensions are 23' - 0 1/2" x 23' - 0 1/2", excluding the angle buttresses and entrance porch. The latter measures 9' - 2 1/2" wide and 9' - 10" deep. The exterior height measures 28' - 4 1/2" from the ground to the top of the coping at the peak of the gable, excluding the concrete cross which si an additional 1' - 9 1/2" high. The interior floor to ceiling heigh- is 22' - 11 1/2".

Foundations: Although a small portion of the concrete foundation wall is visible, the depth and width are not accessible.

Wall Construction: The exterior bearing walls are constructed of concrete blocks, measuring 1' - 0" high by 3' - 6" to 3' - 8" long. The face to face wall thickness is 1' - 4". The wall rises from a base with wash. This base consists of 2 courses for an overall height of 3' - 0", projecting 3 1/4" beyond the face of the wall. The wall is further articulated by a moulded string course which is a continuous extension of the moulding at the imposts of the lancet arches on the entrance porch. The walls are extended at each exterior angle to form buttresses 1' - 6" wide with a 1' - 4" projection. These buttresses terminate in a double wash 13' -3" above grade. The gable walls are extended 9 1/2" above the roof ridge by a coping, surmounted at each peak with a concrete cross of modified Avillon design, 1' - 9 1/2" square. At the lower end of the rakes, the coping from LABEL-STOPS with small bracketed gables. There are moulded roundels, 2' - 6 1/2" in diameter high in the center of each gable. The roundels are solid except for quatrefoil openings, 5" across, which are open except for wire screening for ventilation.

All exterior wall surfaces are finished in smooth light buff-colored stucco with both vertical and horizontal joints visible.

Structural system, framing: Existing roof framing behind the existing plaster ceiling is not accessible. The gardener, in service for approximately 20 years, states that he remembers when the ceiling was exposed wood resting on timber trusses. It is quite probable that the earlier framing was modeled after that of the Royal Mausoleum, constructed by a German architect, Theodore C. Heuck, in 1863. Concerning this building (the Royal Mausoleum), we are told that "the roof timbers from the four wings formed a dome over the center hall." Timber trusses were definitely used on the exterior porch of Lunalilo's Tomb.

Porches: The entrance porch (mauka side), with pointed arched openings on three sides rises 24'-2 1/2" from the ground to the peak of the gabled coping, excluding the cross. The floor finish is concrete. The existing ceiling is modern concrete, replacing modified hammer beam trusses. Evidence of these trusses is found on the face of the entrance wall of the main structure. The approximate dimensions were ascertained. The hammer brace extended out 2'-0" from the interior face of the wall. There was a horizontal spanning member

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6" deep, which is turn supported an arched collar brace of undetermined dimensions, springing from the end of the hammer brace. The rafter was 8" deep. On the side walls, 2" x 12" pockets, now filled in, were spaced 2'-1" at the intersection of the roof and the wall.

The porch floor is extended on all three open sides 2'-0" beyond the face of the piers, from which concrete finished steps lead to grade. These steps consist of 5 risers at 7 1/2" and 4 treads at 1'-3" including the moulded nosing.

Openings: The single doorway opening consists of a Gothic lancet arch with a hood moulding. The double in-swinging flush wood doors, varnished, are 2 1/4" hung on 3 brass butts. Applied in relief on each of the doors is the royal crown, executed in wood. Two iron grille gates filling the opening are set on the exterior face of the jamb. The principal vertical and horizontal members are 1 1/2" square and the intermediate vertical rods are 3/4" in diameter, spaced 2 3/8" o.c. There is a single vertical locking bolt with recessed keepers in the center at the head and concrete sill, the latter being 1 1/2" above the interior floor. Each gate is hung on a single pintle embedded in the jamb, and a pivot embedded in the sill.

Two lancet windows are centered on the remaining three faces of the building. The interior wall opening is 1'-3" wide and 6'-1 1/2" high. The width of the opening on the exterior is 1'-8 1/2". The two window openings are united by a pattern formed of quoins with an over-all width of 5'-6". Individual hood mouldings occur over each window. The sills and jambs of the reveal are splayed on the exterior while the jambs only are splayed on the interior. The wood window frames consist of 2 3/4" sill, 1 1/2" jamb and 2 1/4" vertical distance at the head, with an over-all width of 11 1/2". There are 6 diamond-shaped panes arranged vertically 10 1/2" o.c. in the center of each window, flanked by half-diamond lights on each side. At the head of the lancet is a single trefoil light. Three of the six windows are of etched yellow stained glass which are probably original. The remaining three are glazed in modern patterned glass.

Roof: Four intersecting gables cover the main structure. The porch also has a gabled roof, the ridge of which is 25'-0" above grade. All Roofs are covered with modern asbestos shingles. A modern galvanized metal ventilator has been installed on the slope on the left (Waikiki) side of the entrance wing. There are no cornices, dormers or towers.

DETAILED DESCRIPTION OF THE INTERIOR

The floor plan is laid out as a single centralized cruciform space with the existing ceiling following the slopes of the four gabled roofs.

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There are no stairways.

The cement underfloor is covered, wall to wall, with a modern red carpet.

Walls and ceilings are finished in smooth white plaster, relieved only by the varnished wood of the simply moulded door trim which is 7" wide and flush with the plaster. There is no wood trim at the window openings which have a 6 3/4" interior reveals.

The sole decorative features of the interior are the three royal standards (kahilis) set in wood table-like stands. The kahilis are executed in red and black feathers and cloth with one at the head of Lunalilo's Tomb and one on each side in the makai arm of the cross.

Lunalilo's Tomb consists of a simple highly polished white marble sarcophagus centered under the crossing. It is 8'-1" x 3'-1 1/2" x 3'-6" (including the 6" vert antique base). The top slab extends 1" on all sides. Read from the right (ewa) side, the name, "Lunalilo," is incised in letters 11" high and 57" long. These are centered. The front (mauka) end panel contains a carved royal crown.

Separated 3'-1 1/2" on the right (ewa) side is the tomb of Charles Kanaina, an exact duplicate of Lunalilo's except that the incised name, "Kanaina," 4" high and 22 1/2" long, begins 4" from the edge nearest the entrance rather then being centered.

There is no notable hardware, artificial lighting nor heating system.

SITE AND SURROUNDINGS

Located in the Honolulu Civic Center in downtown Honolulu, the mausoleum is on the roughly south-east (Waikiki-makai) corner of the intersection of King and Punchbowl streets. It is oriented in a north northeast direction, the entrance facing King Street.

It is enclosed separately within the enclosing walls of Kawaiahao Church (1842) grave yard, the makai-ewa wall common to both. This wall is coral rock stuccoed, 6'-2 1/2" high to the crown of the coping. Enclosure of the other two sides of the tomb grounds is made by a stuccoed wall 2'-0" high, surmounted with a decorative cast and wrought iron fence, 6'-3", over-all height. Enriched intermediate posts are 6'-7 1/2" high. On the outside of this iron fence is the paved carriage way to the Church. On the axis of the tomb entrance a double carriage way gate, flanked by pedestrian gates, leads to a circular carriage way before the tomb. This carriage way is paved with

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coral rock set in cement.

Located 10'-6" away from the walls of the mausoleum are 8 free-standing pedestals, 3 on each side and 2 on the rear, symbolic of the 8 islands. These pedestals are 4'-10 1/2" high, having a 1'-6" square base. The shaft, 1'-0" square, contains decorative panels. The base and the capstone are moulded.

The entire enclosure is landscaped with grass and a large variety of tropical plants and trees. These include the following: Maile scented fern (lauae), Ti, Royal poinciana, Monkey pod tree, Golden shower tree, Native fan palm (loulu), Coconut palm, Golden fruited palm, Queen sago palm, Croton, Plumeria, Pothos vine, Star jasmine, Alexandrian laurel (kamini), Shell ginger, Octapus tree (brassaia) and Guava tree.

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Kawaiahao Church and Mission Houses
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site of the present church. This structure was "the first house consecrated for the worship of God in the Sandwich Islands." It burned in 1824, and Chief Kalanimoku, the prime minister of the Hawaiian kingdom, ordered another built at public expense. It stood near the site of the first and was built of wood, measuring 70 by 25 feet. Upon his return to Honolulu after surpressing a rebellion on Kauai, Kalanimoku early in 1825 ordered a public ceremony of thanksgiving held in this chapel. Apparently this was the first of a long series of public meetings held at Kawaiahao Church. Funeral services for King Liholiho and Queen Kamamalu, who had died in England, were also held in the chapel. To accommodate increasingly large congregations, which sometimes numbered 2,000, a large temporary chapel was built in 1825, but it was soon destroyed by a storm. It was followed by a third meetinghouse, built in 1827, and by a fourth, erected in 1828-1829, the last being a high thatched building, 196 by 63 feet.

In 1833 services in English only began to be held at a building nearby, and Kawaiahao "became more distinctly a Hawaiian congregation." A permanent white congregation was formed in 1837, and the next year a second native church was formed.

At the instance of King Kamehameha III, a long-planned stone church was begun in 1836. The task of constructing a stone building 144 feet long and 78 feet wide was a huge one for the time and place; and the funds to purchase needed lumber and materials from Boston were raised by public subscription. During 1837 the work of gathering local materials--almost 14,000 coral rocks, timber, and lime--was started. The cornerstone was laid on June 8, 1839; but Hiram Bingham, pastor and architect of the new church, was forced by ill health to leave before the building was completed. It remained for the Rev. Richard Armstrong to preside over the dedication on July 21, 1842. King Kamehameha III participated in the ceremony and gave the church lands to the membership. From its dedication until the present day Kawaiahao has remained an active church, and it is still considered "the center of worship for the Hawaiian race."

The structure also served as the scene for a number of important state events, and it was for a number of years the place of the annual meetings of the American mission. Here in 1843 King Kamehameha III held a thanksgiving ceremony after the restoration of Hawaiian rule by Admiral Thomas, on which occasion he is said to have spoken the words which became Hawaii's motto. The legislative assembly of 1848 was convened in the church. Here Kamehameha IV and King Lunalilo were formally "inaugurated"; and here met the unfortunate constitutional convention of 1864. In this building Kamehameha IV married Emma Rooke in 1856; and here lay in state the bodies of Kamehameha III, Queen Emma, Princess Kaiulani, Queen Liliuokalani, and many other notables of the Hawaiian kingdom.

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The building has had several changes in name. At first called Stone Church, Honolulu First Church, or the King's Chapel, the name Kawaiahao church came into formal usage in 1862. The church is still very active and continues to carry out its historic functions as a religious center for the Hawaiian people. Services are conducted in both English and Hawaiian.

Three Old Mission Houses:[2] These three buildings, together with the nearby Kawaiahao Church, form the most important and impressive single physical monument to the work of the Hawaiian Mission, sent to Hawaii by the American Board of Commissioners for Foreign Missions, a Protestant organization supported by the Congregational, Presbyterian, and several other churches. For about 40 years after 1820 the Protestant missionaries probably were the most important force in Hawaiian politics, economics, religion, education, and social customs. The missionaries found the native Hawaiian culture disintegrating after the abolition of the old kapus and under the impact of European technology. They provided a new set of ideals and standards around which the natives could orient their lives. They found the native population decimated by European diseases and vices. They introduced medicine and attempted to regulate morals. They became advisers to royalty and brought law and democracy into the government to replace feudal autocracy and royal whim, helped keep the islands free of European entanglements, and strengthened economic and political ties with the United States. They found the Hawaiians illiterate and taught most of the population to read and write; they introduced ideals of universal education which still persist. They attempted to teach the natives the mechanical techniques of Western culture and introduced new agricultural methods and crops in the hope of creating a population of independent freeholders. The total impact of these efforts was tremendous, and the effects are apparent to this day. Even after the power of the missionaries was reduced, they and their families were an important factor in the group of foreigners who came to dominate the economic and political life of the islands.

The center of all this effort was in the Mission Houses in Honolulu, which in effect were the island headquarters of the Hawaiian Mission. Here was the source of that driving zeal and idealism which have helped mold the modern Hawaii. The significance of these structures has been well stated by Bradford Smith, who wrote in 1956: "In the heart of Honolulu, surrounded by a coral wall, the old mission houses still stand--the old white clapboard house where Bingham lived, the little coral print shop, the thick-walled coral house Levi Chamberlain built. Past them streams the modern traffic of a busy city. But they are still there in the heart of it all. And so are Bingham and Richards, and Judd and Armstrong, and all the rest--forevermore."

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[2]John A. Hussey, NSHHSB form, "Mission Houses," July 19, 1962, Historic Sites Survey, HCRS.

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The stories of the individual buildings are as follows:

Oldest Frame House. When the first company of missionaries prepared to leave New England for Hawaii in 1819, a Boston shipping firm donated an entire frame house, dissassembled, to be erected in the islands "for the comfort of the ladies." There being no room on the first vessel, the Thaddeus, the house did not reach Honolulu until Christmas day, 1820, by which time the missionaries at that place had spent nearly 8 uncomfortable months in thatched houses. Unloaded from the Tartar, the house was erected only after some delay, occasioned by the need for obtaining royal permission to erect a house larger than the king's. The carpenter work was performed by the missionaries themselves. During August, 1821, the Levi Chamberlain family moved into the one room then completed. The attached kitchen was not built until 1823, and the exterior clapboarding was also a later improvement.

This building was not, as is frequently stated, the first frame house to be erected in the islands, since several chiefs had bought similar dwellings from traders, but at the time "it was the most impressive." The house sheltered a number of mission families, including, until 1840, that of Hiram Bingham, the firm and stubborn, but able, leading spirit of the mission during its first 2 decades. "Through him," it has been said, "the New England mind pressed its qualities so strongly upon Hawaii that other possibilities came to seem alien."

Lucy Thurston, a missionary wife who was among the first residents in the house, has left a record of her joy at being able to move into a structure which had doors that could be shut against the ever-present curious natives. The cheerful wallpaper--pink, with vines of tinsel--was the gift of a sea captain and was stuck on with pol.

The house was sold by the mission to the Cooke family in 1851, and in 1925 it was deeded to the Mission Children's Society. One of the latest of several restorations was carried out in 1935, at which time the framework was replaced. The building was restored in 1968.

First Printing House. Even before the first missionaries left Boston, they realized that the success of their work would be largely dependent upon their being able to spread their religious message through the printed word. They brought with them on the Thaddeus a battered, second-hand Ramage press and a young printer, Elisha Loomis. Since Loomis was kept busy with carpentry and other duties, it was January 7, 1822, before the first printing was done in a grass house in Honolulu. This earliest printing in the "North Pacific region" was a vast impetus to the spread of education among the Hawaiian people.

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In December, 1822, Daniel Chamberlain began construction of a more permanent print shop. The walls were of coral blocks cut nearby and cemented with common soil. The small shop, 28 by 17 feet, was completed in December, 1823, and saw "the genesis of the important printing industry" of present-day Hawaii. An early product was a 60-page hymnal; and before the end of 1824 Loomis produced the first commercial printing product--some blank bills of lading. By about 1828 the printing work of the mission had increased so enormously that the press was moved to larger quarters across the street. The coral shop was thereafter used as an adjunct of the frame house and changed ownership with it.

This Printing House is the oldest surviving structure to be associated with the Hawaiian Mission press, which exerted such an important influence upon island history. Largely due to its products, the Hawaiian people in a remarkably short time came to possess one of the highest rates of literacy in the world.

The Chamberlain House. Levi Chamberlain, described as a man who "never demanded as much of others as he asked of himself," came to Honolulu in 1822 as business agent for the mission. It was his task to store the food, clothing, furniture, and other supplies needed by all the island stations and to distribute them as required. Grass houses proved inefficient and costly for warehouse use, and in 1830 he started to build a two-story, coral-stone structure, with cellar and attic. When the building was completed in December, 1831, he moved his family into 3 rooms on the lower floor. The rest of the house was used to store the mission property. The pulley and door used to raise the boxes and barrels to the second story are still in place.

Long in ill health, Chamberlain called his family about his bed one day in 1849 and said to his wife, "Farewell. Very pleasantly have we lived together for twenty-one years. Now we must separate. I commit you to the Lord." Then this man, who more than any other had kept the fiscal affairs of the mission in good order, fell asleep and died with "not a wrinkle in his forehead." The Chamberlain family continued to live in the house and, later, acquired ownership. It became the property of the Mission Children's Society in 1910.

The Adobe Schoolhouse.[3] The Adobe Schoolhouse was constructed during the period 1833-1835, of air-dried adobe bricks and lumber, as it became available, to replace the earlier straw school and meeting house.

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[3]HABS Photographic-Data Book Report, HA-19, "Adobe Schoolhouse," Frances Jackson, September 1966.

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The "most beautiful room in Honolulu," as architects have called it, was used for a school, for the annual spring General Meeting of the Mission, as a social hall, and, in 1855, as the scene of a wedding between two mission "cousins." In 1852, it saw the establishment of the Hawaiian Mission Children's Society, often known as the Cousins Society, a group of missionary descendents whose parents had long called each other "brother" and "sister."

For a while during the 1870's, the building was rented to the Government for use as a publis school, at which time a partition was put in. Later, it housed the Thursday daytime meetings of Kawaiahao Church and became known as Hale Posha, the Thursday House of Kawaiahao.

The building's specific significance rests with its historic association with the mission complex expressed by its use as the educational center of the missionary operation.

King Lunalilo's Tomb. King Lunalilo's tomb, one of the early concrete block buildings in Hawaii, was built at the direction of Lunalilo's will. Apparently because of disagreement with a rival branch of the royal family, Lunalilo chose to be buried in Kawaiahao Churchyard rather than the Royal Mausoleum.

Its association with the Kawaiahao Church justifies in inclusion within the landmark.

Historical information on the Tomb:[4]

A disagreement between rival branches of the royal family may be the reason for King Lunalilo's request to be buried in Kawaiahao Churchyard. The remains of many of the Hawaiian royalty had been buried at the old mausoleum on what is now the Iolani Palace grounds, but in 1865 when the new Royal Mausoleum in Nuuanu Valley was completed, most of them were removed to the new tomb. One of the exceptions was the High Chiefess Kekauluohi, mother of Lunalilo. Indignant about this act of disrespect by King Kamehameha V, Lunalilo vowed that he would not be buried at the Royal Mausoleum, but near his mother. There is some question whether Kekauluohi's bones remained in the old burial place. According to some accounts, they were removed by Lunalilo's family and buried at sea many miles off Diamond Head.

After Lunalilo became King in January 1873, he carried through his decision. On January 31, 1874, just four days before his death, the King approved a final codicil to his will, providing that a suitable tomb for his remains and for

[4] HABS Data Sheets, file HA-15, prepared by Karmen N. Tiahrt, State Archives, June 1967. Data Sheets are footnoted. Footnotes deleted here.

GPO 892 455

Form No. 10-300a
(Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

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DATE ENTERED

Kawaiahao Church and Mission Houses
CONTINUATION SHEET ITEM NUMBER 8 PAGE 7

those of his father, Charles Kanaina, be erected in Kawaiahao Churchyard. Upon his death, Lunalilo's casket was temporarily placed in the Royal Mausoleum at Nuuanu until his own tomb could be constructed.

At the request of the executor of Lunalilo's will, on September 19, 1874, the executive committee of Kawaiahao Church dedicated and set apart a site for the erection of the tomb on the west side of the Churchyard. Construction apparently began at the end of the year and was fully underway by January 1875. Robert Lishman, an Englishman who had come to Hawaii from Australia in 1871, was architect and supervisor of the construction. By October 1875, the building was completed.

The tomb was one of the first buildings in Hawaii to be constructed of concrete block, the first being the Kamehameha V Post Office, 1870. It was built in the form of a Greek cross, approximately 11 feet square at the crossing. The roof was of slate and each of the four gables was topped by a small cross. On three sides were narrow stained glass windows. A small porch adjoined the entrance of the tomb. The floor was of smooth concrete and the interior walls of white stucco. The doors and all interior trim were made of stained oak. Over $6,000 was spent for construction of the tomb.

A smooth cemented carriageway leading from the entrance gates to the tomb circled around an open plot on which "rich exotics" were to be planted. Evergreens and other rare trees were also to be added to the grounds. Early pictures show that the eight concrete pedestals which stand around the sides of the tomb were used to hold kahilis (royal standards). The suggestion was made that Lunalilo's father install chimes in the Kawaiahao bell tower in memory of the late King, which on the anniversary of his death could plat "from sunrise to sunset solemn requiems." The suggestion, however, was not carried through.

The night of Tuesday, November 23, 1875, was chosen to transfer Lunalilo's casket to the new tomb. It was customary when necessary to transfer the remains of Hawaiian royalty from one tomb to another, to move them only at night, usually shortly after midnight. This procedure had been followed in 1865 when the new Royal Mausoleum was completed and it was also done at this time. It is said that Lunalilo's father, Charles Kanalana, requested that a royal salute be fired from the government battery on the crest of Punchbowl while the transfer of Lunalilo's remains from the Mausoleum to the new tomb was being made. On the grounds that Lunalilo was no long King and thus not entitled to a salute, King Kalakaua refused. However, as the hearse carrying Lunalilo's casket moved into Kawaiahao Churchyard on November 23, a loud clap of thunder was heard. Some participants claimed, in fact, to have heard twenty-one distinct claps of thunder as the hearse made its way through the city to the new tomb. It was said by the Hawaiian people that this was a heavenly royal salute to their beloved King Lunalilo.

(CONTINUED)

GPO 892 455

Form No. 10-300a
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UNITED STATES DEPARTMENT OF THE INTERIOR
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NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

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Kawaiahao Church and Mission Houses
CONTINUATION SHEET ITEM NUMBER 8 PAGE 8

Lunalilo's casket, which was placed in the tomb, was made by William Fischer of native Hawaiian Koa and Kou wood. On it were three silver ornaments made by Mr. Eckart, a crown three to four inches in diameter, a ten by twelve inch plate inscribed in Hawaiian with Lunalilo's name, the dates of his life, and the length of his reign. This plate was surrounded by a wreath of maile leaves, also made of silver. Below this was a silver scroll with the inscription, Ua mau ke ea o ka aina i ka pono (The life of the land is perpetuated in righteousness.), the motto of the Kingdom first uttered by King Kamehameha III in 1843. The casket was covered with a black velvet pall on which six gilt Hawaiian coat-of-arms had been embroidered. This was replaced in 1879 by a similar pall imported from Europe and reported to have cost nearly $1,000.

Less than two years later, Lunalilo's father, Charles Kanaina, died, and his casket, also made of Koa and Kou wood, was placed in the tomb on March 29, 1877.

In 1879 a case was argued before the Supreme Court of the Kingdom of Hawaii to determine the right of possession, care, and control of the tomb. The Legislature had appropriated $400 annually as wages for a keeper of the tomb. This implied the right of the Minister of the Interior, as dispensor of the fund, to claim possession of the tomb. The Minister had, in fact, refused to surrender the keys to the trustees of the estate. The trustees held, however, that it was "quite plain" from Lunalilo's will that he wished his remains to be free of state control and the Legislature had incurred no obligation to pay for the tomb. The case was decided in favor of the trustees.

In 1888 it was found that care of the tomb had been much neglected, and an annual salary $250 for a keeper was provided by the estate. In addition, over $300 was spent in repairing the tomb and painting the iron fence which enclosed the lot. Various other small repairs were undertaken in the ensuing years. In October 1917 vandals broke into the tomb, breaking the locks of the wooden doors to the building. The silver ornaments which adorned Lunalilo's casket were stolen, but detectives recovered them in Florida some time later.

On January 31, 1938, the first ceremony to be held at the tomb since Lunalilo's death took place. At the proceedings which marked the anniversary of Lunalilo's birth, the three royal kahilis (standards) which stood by his casket were to be replaced for the first time since 1874. The ceremony began as the bearers of the new royal kahilis, accompanied by a guard of honor and other participants, marched from Honolulu Hale to the tomb. A red kahili was placed at the foot of Lunalilo's casket and a red and yellow kahili on either side. A bundle of ti leaves entwined with strands of crown flowers was placed on the head of the casket, which was draped with a royal blue velvet pall embroidered with the trimming of the original pall. A traditional rain shower fell during the ceremony at the tomb.

(CONTINUED)

GPO 892 455

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UNITED STATES DEPARTMENT OF THE INTERIOR
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Kawaiahao Church and Mission Houses
CONTINUATION SHEET ITEM NUMBER 8 PAGE 9

In 1947 alterations and repairs amounting to over $8,000 were undertaken at the tomb. Although unable to determine the exact nature of these alterations, it is pro-able that at this time the slate roof was replaced with asbestos shingles. Two years later in 1949, marble vaults to enclose the caskets were constructed at a cost of $2700.

The tomb, which is usually closed to the public, is opened once each year on the anniversary of King Lunalilo's birthday.

GPO 892 455

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NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

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Kawaiahao Church and Mission Houses
CONTINUATION SHEET ITEM NUMBER 9 PAGE 1

References are drawn from the cited forms of the National Survey of Historic Sites and Buildings and Historic American Buildings Survey. The following are general references detailed citations can be found in the relevant data sheets of the HABS.

A Grove Day, Hawaii and Its People (New York, 1955), 72, 78, 97-101; [Hawaiian Mission Children's Society], The Three Old Mission Houses (folder, rev. ed., Honolulu, 1958); Ralph S. Kuykendall, The Hawaiian Kingdom, 1778-1854 (Honolulu, 1938), passim; "Mission Houses, Honolulu" (Typewritten, Hawaiian Mission Children's Society); Bradford Smith, Yankees in Paradise (Philadelphia, 1956), 71-75, 294-295; Lucy G. Thurston, Life and Times of Mrs. Lucy G. Thurston (Honolulu, 1934), 63-64, 240.

Ethel M. Damon, The Stone Church at Kawaiahao, 1820-1844 (Honolulu, 1945); Ralph S. Kuykendall, The Hawaiian Kingdom, 1778-1854 (Honolulu, 1938), 220, 338, 342, 354, 413; Ralph S. Kuykendall, The Hawaiian Kingdom, 1854-1874 (Honolulu, 1953), 33, 83, 106, 239, 245; Charles E. Peterson, "Pioneer Architects and Builders of Honolulu," 72nd Annual Report of the Hawaiian Historical Society for the Year 1963 (Honolulu, 1964), 9.

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Form No. 10-300a
(Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

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Kawaiahao Church and Mission Houses
CONTINUATION SHEET ITEM NUMBER 10 PAGE 1

VERBAL BOUNDARY DESCRIPTION

Refer to Tax Map, Island of Oahu, Zone 2, Sec. 1, Plat 32, current in 1978 a copy of which is enclosed with this form. The boundary of the landmark is shown in red on that copy. Beginning at the west corner of parcel 15, proceed in a generally northeast direction along the north side of parcel 15 to the north corner of said parcel; thence general south along the east side of said parcel, continuing in a straight line along the east side of parcel 23 to said parcels extreme east corner; thence in a generally counter clockwise fashion along the entire boundary of parcel 17 returning to the point of origin.

A second unit of the landmark is bounded thus: the boundary of the unit is the boundary of parcel 2 which includes the older parcel 3.

Justification: The boundary includes two units because the two elements of the landmark--the church and the mission houses--have traditionally been understood as distinct elements. Furthermore, there is no practical or historical reason to depart from the physical and distinct fence lines that enclose two distinct physical elements. Each boundary mutually encloses its component elements and setting: (1) Church--church proper, Lunalilo's tomb, cemetery and old schoolhouse; (2) Mission houses--Chamberlain house, first printing building and first frame house.

GPO 892 455

Form No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

DATA SHEET

FOR NPS USE ONLY
RECEIVED DEC 9 1975
DATE ENTERED MAY - 2 1976

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC: ALOHA TOWER
AND/OR COMMON:

2 LOCATION

STREET & NUMBER: PIER 9, HONOLULU HARBOR
NOT FOR PUBLICATION
CITY, TOWN: HONOLULU
VICINITY OF
CONGRESSIONAL DISTRICT: 1st
STATE: HAWAII CODE: 15
COUNTY: HONOLULU CODE: 003

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
___DISTRICT	X PUBLIC	X OCCUPIED	___AGRICULTURE	___MUSEUM
X BUILDING(S)	___PRIVATE	___UNOCCUPIED	X COMMERCIAL	___PARK
X STRUCTURE	___BOTH	___WORK IN PROGRESS	___EDUCATIONAL	___PRIVATE RESIDENCE
___SITE	PUBLIC ACQUISITION	ACCESSIBLE	___ENTERTAINMENT	___RELIGIOUS
___OBJECT	___IN PROCESS	___YES: RESTRICTED	X GOVERNMENT	___SCIENTIFIC
	___BEING CONSIDERED	___YES: UNRESTRICTED	___INDUSTRIAL	___TRANSPORTATION
		___NO	___MILITARY	___OTHER:

4 OWNER OF PROPERTY

NAME: Department of Transportation, Harbors Division, State of Hawaii
STREET & NUMBER: 869 Punchbowl Street
CITY, TOWN: Honolulu
VICINITY OF
STATE: Hawaii

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.: Bureau of Conveyances
STREET & NUMBER: 403 South Queen Street
CITY, TOWN: Honolulu
STATE: Hawaii

6 REPRESENTATION IN EXISTING SURVEYS

TITLE: Hawaii Register of Historic Places
DATE: June, 1973
___FEDERAL X STATE ___COUNTY ___LOCAL
DEPOSITORY FOR SURVEY RECORDS: Historic Preservation Office
CITY, TOWN: Honolulu
STATE: Hawaii

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
___EXCELLENT	___DETERIORATED	___UNALTERED	X ORIGINAL SITE
X GOOD	___RUINS	X ALTERED	___MOVED DATE_____
___FAIR	___UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

A 184-foot, ten storied,concrete tower. Best described as a "modernistic" interpretation of a Gothic tower with its accentuated vertical lines terminating at each corner in square pylons with vertical slot, arched windows, arched lintels, and convex curved pointed hip roofs of stucco finish. Projecting above the corner roofs is a higher roof of similar form terminating with a pedestal form of "widows walk" with wrought iron hand rail. At each side of the central roof is a stuccoed dormer similar in form to the corner pylon windows with small gable roofs. The highest point is a mast with a cross arm at the top and various cables which are used to hang signals to transmit information to ships in or near the harbor. At the tenth floor level a projecting observation balcony with the legend "ALOHA" in large block letters is incised in the parapet wall5. The exterior surface is painted white.

The Aloha Tower remains as an important architectural element in the Honolulu skyline and represents the warm welcome and atmosphere the people of Hawaii have always maintained for visitors from across the sea.

Offices are located on all floors. The tenth floor has a projecting observation balcony and the room is mainly open with a central kiosk containing tourist information. There is also a small office in which the harbor pilot works. A radiotelephone is enclosed in this office. Offices are reached by both stair and elevator with three windows on each side connected by a vertical band. The flooring throughout is lineoleum tile.

8 SIGNIFICANCE

PERIOD

__PREHISTORIC
__1400-1499
__1500-1599
__1600-1699
__1700-1799
__1800-1899
X 1900-

AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW

__ARCHEOLOGY-PREHISTORIC
__ARCHEOLOGY-HISTORIC
__AGRICULTURE
X ARCHITECTURE
__ART
X COMMERCE
__COMMUNICATIONS
__COMMUNITY PLANNING
__CONSERVATION
__ECONOMICS
__EDUCATION
__ENGINEERING
__EXPLORATION/SETTLEMENT
__INDUSTRY
__INVENTION
__LANDSCAPE ARCHITECTURE
__LAW
__LITERATURE
__MILITARY
__MUSIC
__PHILOSOPHY
__POLITICS/GOVERNMENT
__RELIGION
__SCIENCE
__SCULPTURE
__SOCIAL/HUMANITARIAN
__THEATER
X TRANSPORTATION
__OTHER (SPECIFY)

SPECIFIC DATES 1926, 1941, 1947 BUILDER/ARCHITECT NATIONAL CONSTRUCTION COMPANY ARTHUR REYNOLDS, ARCHITECT

STATEMENT OF SIGNIFICANCE

The Aloha Tower was at one time the tallest and most prominent building in Honolulu. It is a symbol of Hawaii's investment in tourism and a reminder of the time when sea travel was the main link with the rest of the world. It was a center for the planning of military convoy operations during World War II.

In 1925, the uncompleted Aloha Tower was the center of a fierce little controversy involving the public, the Board of Harbor Commissioners, and the Territorial Legislature. Some wanted no tower at all, some wanted a ten-story structure, while others favored a compromise seven-story building. After several months of debate, the issue was settled in the legislature in favor of the ten-story advocates.

When the tower was finally completed and turned over to the Board of Harbor Commissioners in June, 1926, it was the pride of the islands. It was by far the most imposing building in the territory and offered a spectacular view of Honolulu and its harbor. Then as now, it housed various offices, including the Harbor Master's. The tenth floor was an observatory and also housed a lookout station for the harbor pilots. Vessels calling at Honolulu could see the tower's brillaint white profile from as far as fifteen miles out. For thousands of tourists arriving by ship, it was a symbol of welcome, while for local citizens, an indicator of their ties with the sea and of the importance of sea transportation to Hawaii's economy. Before the advent of trans-Pacific aircraft, it was the landmark in Honolulu's waterfront area.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

Honolulu Advertiser, May 20, 1926; May 29, 1926; May 30, 1926; May 31, 1926; August 28, 1945; December 28, 1945; May 8, 1947.
Honolulu Star-Bulletin, June 28, 1926; September 13, 1945; January 21, 1948; March 20, 1960; October 15, 1961
Historic Buildings Task Force, Old Honolulu (Honolulu, 1970), 51.

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY .08

UTM REFERENCES

A [1 4] [0 3 7 4 8 0] [2 3 5 5 6 0 0] B [ ] [ ] [ ]
ZONE EASTING NORTHING ZONE EASTING NORTHING
C [ ] [ ] [ ] D [ ] [ ] [ ]

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE CODE COUNTY CODE

STATE CODE COUNTY CODE

11 FORM PREPARED BY

NAME / TITLE
Gary T. Cummins, Director

ORGANIZATION
Hawaii Register of Historic Places

DATE
August 12, 1975

STREET & NUMBER
DLNR, Box 621

TELEPHONE
808-548-7460

CITY OR TOWN
Honolulu

STATE
Hawaii 96809

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL X

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE State Historic Preservation Officer, Hawaii DATE October 20, 1975

FOR NPS USE ONLY
I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER
Acting DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION DATE 5/13/76
ATTEST: DATE 5.18.76
KEEPER OF THE NATIONAL REGISTER

GPO 892-451

Form No. 10-300a (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

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RECEIVED 1975
DATE ENTERED MAY 12 1976

CONTINUATION SHEET 1 ITEM NUMBER 8 PAGE 1

Immediately after the Japanese attack on Pearl Harbor on December 7, 1941, the United States Navy took over control of Aloha Tower. Access to all but authorized persons was denied, and the landmark was patrolled constantly by armed sentries. This control did not relax even after the war eneded,and the continuing military occupation of the tower became the object of complaint from local citizens. Before a full-scale controversy developed, the United States Coast Guard, who utilized the tower under the authority of the U. S. Navy, relinquished its control on December 20, 1947.

The reason for the wartime secrecy was that the tower had been a control facility for military convoy shipping for the Pacific Theater of Operations. Many of the convoys that supported the various island invasions were formed in Honolulu under the control of the Aloha Tower offices.
In 1947, the green camouflage paint was sandblasted from the tower and the brillian white paint replaced. Once again, Aloha Tower welcomed visitors arriving aboard cruise ships also recently released from military control. However, it was not long before the emphais in travel shifted from passenger vessels to aircraft. Before long, a passenger ship in Honolulu Harbor became an unusual sight.
Aloha Tower still stands to welcome visitors, however, and the Harbor pilots still carry out their watch over the activities below. Recently, the tower became the main terminal for a new inter-island hydrofoil commuter vessel system.

Form No. 10-300a (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

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CONTINUATION SHEET 2 ITEM NUMBER 8 PAGE 2

Aloha Tower is a reminder to all people of the hospitable nature of the fiftieth State, and it is a symbol of a day when travel was more than going from one point to another, but an adventure in grace and comfort.

NPS Form 10-900
(Oct. 1990)

1558
OMB No. 10024-0018

United States Department of the Interior
National Park Service

RECEIVED
DEC 20 1993
NATIONAL REGISTER

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name SMYTH, MABEL, MEMORIAL BUILDING

other names/site number N/A

2. Location

street & number 510 Punchbowl Street (corner of Punchbowl & South Beretania Streets) ☐ not for publication

city or town Honolulu ☐ vicinity

state Hawaii code ___ county Honolulu code 003 zip code 96813

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this ☐ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. I recommend that this property be considered significant ☐ nationally ☐ statewide ☐ locally. (☐ See continuation sheet for additional comments.)

Signature of certifying official/Title — Date 12/16/93

State of Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. (☐ See continuation sheet for additional comments.)

Signature of certifying official/Title — Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is:
☐ entered in the National Register. ☐ See continuation sheet.
☐ determined eligible for the National Register ☐ See continuation sheet.
☐ determined not eligible for the National Register.
☐ removed from the National Register.
☐ other, (explain:) ___

Signature of the Keeper — Date of Action 2/3/94

SMYTH, MABEL, MEMORIAL BUILDING (Name of Property) — Honolulu, Hawaii (County and State)

5. Classification

Ownership of Property (Check as many boxes as apply)
☐ private
☐ public-local
☒ public-State
☐ public-Federal

Category of Property (Check only one box)
☒ building(s)
☐ district
☐ site
☐ structure
☐ object

Number of Resources within Property (Do not include previously listed resources in the count.)

Contributing	Noncontributing	
one	–	buildings
–	–	sites
–	–	structures
–	–	objects
one	–	Total

Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.)
N/A

Number of contributing resources previously listed in the National Register

6. Function or Use

Historic Functions (Enter categories from instructions)
HEALTH CARE/SOCIAL/EDUCATION/RECREATION

Current Functions (Enter categories from instructions)
EDUCATION/RECREATION

7. Description

Architectural Classification (Enter categories from instructions)
MODERN MOVEMENT/ART DECO/'HAWAIIAN STYLE'

Materials (Enter categories from instructions)
foundation reinforced concrete
walls reinforced concrete with stucco surface
roof ceramic tile
other bronze decorative rain spouts

Narrative Description (Describe the historic and current condition of the property on one or more continuation sheets.)

SMYTH, MABEL, MEMORIAL BUILDING (Name of Property) — Honolulu, Hawaii (County and State)

8. Statement of Significance

Applicable National Register Criteria (Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)
☒ A Property is associated with events that have made a significant contribution to the broad patterns of our history.
☐ B Property is associated with the lives of persons significant in our past.
☒ C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
☐ D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations (Mark "x" in all the boxes that apply.)
Property is:
☐ A owned by a religious institution or used for religious purposes.
☐ B removed from its original location.
☐ C a birthplace or grave.
☐ D a cemetery.
☐ E a reconstructed building, object, or structure.
☐ F a commemorative property.
☐ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance (Enter categories from instructions)
Architecture
Health/Medicine
Social History

Period of Significance
1941

Significant Dates
January 4, 1941

Significant Person (Complete if Criterion B is marked above)
N/A

Cultural Affiliation
N/A

Architect/Builder
Dickey, Charles William (with associates, William D. Merrill, James C. Sims and Kenneth Roehrig, architects)
Pacific Construction, Co., and City Construction Co., Builders/Contractors
Thompson, Robert, landscape architect

Narrative Statement of Significance (Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):
☐ preliminary determination of individual listing (36 CFR 67) has been requested
☐ previously listed in the National Register
☐ previously determined eligible by the National Register
☐ designated a National Historic Landmark
☐ recorded by Historic American Buildings Survey #
☐ recorded by Historic American Engineering Record #

Primary location of additional data:
☒ State Historic Preservation Office
☒ Other State agency State Archives, State Library
☐ Federal agency
☐ Local government
☒ University Asian & Pacific Library, Hamilton Library, University of Hawaii
☐ Other Honolulu Advertiser, newspaper archives

Name of repository: Queens Medical Center Archives

SMYTH, MABEL, MEMORIAL BUILDING (Name of Property) — Honolulu, Hawaii (County and State)

10. Geographical Data

Acreage of Property 28,213 square feet

UTM References Clarke 1886 Spheroid (Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing
1	0 4	6 1 8 3 0 0	2 3 5 6 6 2 5
2			
3			
4			

☐ See continuation sheet

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet.)

Boundary Justification (Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Sanna Saks Deutsch (student, University of Hawaii at Manoa, Honolulu, Hawaii)
organization Pacific Preservation Consortium, Department of American Studies date May 5, 1993
street & number home: Pualei Circle, 3030 telephone (808) 922 8554
city or town Honolulu state Hawaii zip code 96815

Additional Documentation (Submit the following items with the completed form:

Continuation Sheets

Maps

A **USGS map** (7.5 or 15 minute series) indicating the property's location.

A **Sketch map** for historic districts and properties having large acreage or numerous resources.

Photographs

Representative **black and white photographs** of the property.

Additional Items (Check with the SHPO or FPO for any additional items)

Property Owner (Complete this item at the request of SHPO or FPO.)

name State of Hawaii [Department of Accounting and General Services]
street & number 1151 Punchbowl Street telephone Public Works:(808) 586 0526
city or town Honolulu state Hawaii zip code 96813

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Projects (1024-0018), Washington, DC 20503.

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Section number 7 Page 1

SMYTH, MABEL, MEMORIAL BUILDING
Honolulu, Hawaii

Narrative Description

The Mabel Smyth Memorial Building was funded through popular subscription and was built and maintained as an expression of the Territorial and then the State of Hawaii's respect for the nurses and doctors of the developing medical profession. Dickey's 1937 design for the Memorial Building is a two-storied, L-shaped concrete structure, capped by a tiled hip roof with overhanging eaves. The building measures approximately 42 x 69 feet, and is positioned on the parcel so that it could take advantage of the widest span, almost abutting the property line in back. The main entrance to the building is from the parking lot via two sets of stairs which lead to a central landing before the door. Forming a railing is a design of 'ape leaves set between low posts. The 'ape motif is repeated above the door in a large panel. Among the leaves is a snake from the medical profession's symbol, the caduceus. While the building is not symmetrical, it presents a balanced facade. To the left of the entrance are the offices and larger rooms. Moving from the entrance are four bays of offices each with a single large metal casement window pair per floor. The windows are organized within a vertical panel with ape leaf reliefs below the second story windows. At the far left end of the building are the larger Alice Yates Memorial Room on the ground floor and the former Charles Adams Medical Library above. These rooms have larger banks of windows, three sets of casements per floor. Once again, the ape motif is repeated below the second story windows. To the right of the entrance is the auditorium space. It is revealed on the exterior by inset vertical panels corresponding in dimension to the window bays on the left hand side.

When complete, it contained an air-conditioned auditorium that seated 346 people; various meeting halls that were designated to honor other outstanding nurses (i.e. the Alice Yates Lounge and Lanai, the Stella Matthew Room); provisions for the Dr. Charles R. Adams Medical Library; classrooms and staff offices; kitchen, dressing room and toilet facilities; and for its time, a quite innovative parking space that was commodious and accessible from the two major streets it bordered. The layout of the interior has not changed significantly. However, in 1964 the Charles R. Adams Medical Library was moved to a new, larger structure adjacent to the Smyth Memorial Building, and this affected how the latter functioned from then on.

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National Register of Historic Places Continuation Sheet

Section number 7 Page 2

The walls of the entry and lobby still are covered with the original block paneling of mahogany and primavera wood veneers, slightly water damaged and peeling through recent neglect, but easily restored. The auditorium has suffered from asbestos removal procedures, normal wear and tear, and the introduction of hi-tech multiple screen video equipment, yet it remains in continuous use. It retains many of its better features, such as the sequenced subtly shaded concrete wall panels, the hanging light fixtures, etc. The Alice Yates Lounge on the ground floor no longer has wainscoting carved with the 'ape motif, described in early articles about the building (only two panels on the double door leading to the lanai are preserved); but the door serving the former medical library, on the second floor, is ornately carved with torch ginger, and remains a beautiful example of 'Hawaiian Style' detailing. Overall, the high ceilings, ample proportions and airy lightness in the main reception room and now vacant offices, attest to the hospitable spirit and gracious life style that Dickey expressed in his architectural concepts.

The original blueprints for the Smyth Memorial Building, along with most of Dickey's professional archives, were, according to Dickey's biographer, Robert Jay, discarded or dispersed by the successors' firm when it moved offices a few years after his death. Only one modification of kitchen facilities and the regendering of toilets, submitted by Dickey on December 5, 1939, before the completion of the building, was deposited in the hospital archives and thus is extant. The measured drawings of the existing building were produced by Architects Hawaii, Ltd., Honolulu, in May 1978. An overall ground plan of Queen's Hospital, done by Dickey Associates in November 28, 1944 (also found in the hospital archives, indicates that the silhouette of the building and its property boundaries had not changed between 1944 and 1978. In 1981, a storage space for an annual Christmas fund raising projects run by hospital volunteers, was added to the rear of the building by S & M Sakamoto, Inc. In 1991, ownership of the building and property passed from the Queen's Medical Center to the State of Hawaii, in an exchange for nearby undeveloped land that was needed for expansion of medical facilities. The building now houses the State Capitol Tour and Information Program, a division of the Governor's Office of Information; it is designated in long term plans for multiple uses.

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Section number 8 Page 1

Narrative Statement of Significance:

The Mabel Smyth Memorial Building is significant as an example of the work of architect C.W. Dickey and for its associations with the medical profession in Hawaii. In 1937, in reaction to the sudden and early death of Mabel Leilani Smyth, who had for eight years been Superintendent of the Public Nursing Service, there was a Territorial-wide drive to commemorate her accomplishments. A unique center was envisioned, one that would be headquarters for the entire medical profession, in which nurses' and doctors' associations could convene their meetings; a research library could be housed; and where people could gather for educational programs and social interactions. Eventually, about $100,000. in money and services was raised from the community at large. Queen's Hospital provided a small triangular plot of land (28,213 square feet) at the makai/Ewa (western) end of its property, where Punchbowl and South Beretania Streets intersect. Plans were submitted by the locally noted architect, C.W. Dickey, who had also designed the hospital's Harkness Nurses' Residence built in 1932.

The Directory that was posted when the Mabel Smyth Memorial Building was opened on January 4, 1941, is a clear indication of how the building was meant to function:

First Floor:
- Offices of the
  - Nurses Association, Territory of Hawaii Nurses Association, City and County of Honolulu Board of Nursing Registration Nursing Service Bureau
  - Physicians' Exchange
- Nurses Board Room
- Alice Yates Room - Nurses' lounge and lanai
- Auditorium - available to the community for lectures, conferences and performances.

Second Floor:
- Charles R. Adams Medical Library - Gift of Mrs. Chas. R. Adams. Furnishings - Gift of Mrs. Walter Dillingham.
- Physicians Board Room.
- Offices of the
  - Hawaii Territorial Medical Association.
  - Honolulu County Medical Society.

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Section number 8 Page 2

The building has fine qualities as a modest, sincere architectural monument. It is sensitively positioned in relation to the buildings and landscaping around it and provides a good human scale. Its decorative facade is uniquely Hawaiian and although representative of the Art Deco period, it has a timeless attractiveness. It thereby is a significant historic physical entity in the Capitol District of Honolulu.

The people associated with the building, the person whose name it honors, and its architect are also are significant in their own right. The life of Mabel Leilani Smyth (1892-1936) was marked by her dedication to the well-being of others, by her innate authority and the affection that her personal qualities drew forth, and by the improvement in public health nursing that she achieved throughout the Hawaiian Islands. She, more than anyone, pioneered in the development and organization of public health nursing in the pre-World War II era.

Born in Kona of a half-Hawaiian mother and an Irish English Captain of the Inter-Island Fleet, Mabel Smyth did not come to Honolulu for schooling until she was fifteen. At age twenty two she met her goal of attending Springfield Hospital Training School for nurses in Manchester, Massachusetts. When she returned home, she became a district nurse at Palama Settlement, and eventually she headed their nursing program. At thirty, she was again on the mainland for training, receiving her degree in Public Health Nursing at Simmons College in Boston. At thirty five, she became Director of Public Health Nursing in the Territorial Board of Health, a position she held for eight years. Always seeking knowledge of developments in her field, Smyth attended many conferences in Washington and throughout the United States, and as a representative of Hawaii was recognized for her unusual capability. Among the innovations for which she is still known was the organizing of the first well-baby clinic in Hawaii and the campaigns she led to raise midwifery standards. Among the honors conferred on her during her lifetime were election to the Presidency of the City and County Nurses Association, and the Directorship of the Bureau of Maternity and Infancy. At age forty two, she died of complications from an operation. Increasingly, her status as a Hawaiian woman who embodied so many outstanding qualities and achievements, has relevance for the history of the Hawaiian people in the post-contact period, and for the history of women in Hawaii.

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(8-86)

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Charles William Dickey (1871-1942) was born in California. His mother was a member of an extended Kamaaina family, prominent in business and civic affairs in Hawaii, that descended from the earliest American missionaries. When he was two, his parents moved to Haiku, Maui, where he lived until he was sent back to Oakland, to attend high school After graduation with a degree in architecture from the Massachusetts Institute of Technology in 1894, Dickey came to Hawaii to work. He set up practice with several partners and was successful. In 1904, he decided to move back to the Bay Area; and in 1924, he returned to Honolulu, where he remained professionally active until his death. In Hawaii and in California, Dickey designed schools, banks, theaters, churches, municipal buildings, hotels, extravagant imposing residences, and, due to his own priorities, many small reasonably priced single family bungalows.

C.W. Dickey holds the central position in Hawaii's architectural history, a fact that is becoming increasingly recognized. This is not only because of the sheer number, diversity and quality of the buildings that he designed, particularly during the last phase of his career in Hawaii. It also is because of his direct influence on the many architects that he trained in his offices, who came into prominence during the building boom following World War II, and the continuing influence of his existing works on contemporary younger architects. Primarily, however, it is because Dickey very consciously set out to create an indigenous architectural style. As he assimilated and transcended the succession of popular styles of his period, and the older styles that he encountered during his travels abroad, he was creating his own style that met the unique environmental conditions and the special demographics of Hawaii.

His aesthetic criteria--which readily affirmed and incorporated the traditional scale, forms and motifs and standards of workmanship that are associated with the many different cultural heritages of peoples of the Pacific and Western countries who coexist on the Islands--express the humanitarian ideals shared by the people of Hawaii. Perhaps the most significant and uniquely Hawaiian characteristic of the Mabel Smyth Memorial Building is the use of low relief panels featuring the 'ape leaf motif. In native Hawaiian lore, this taro-like plant was planted by gates or placed under the mats of the sick to ward off evil spirits. Thus, Dickey's exterior design incorporates a familiar local image, and one that evokes a traditional Hawaiian use of floral metaphor, to convey the essential purpose of this commemorative edifice.

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(8-86)

OMB Approval No. 1024-0018

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National Park Service

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BIBLIOGRAPHY

Jay, Robert. The Architecture of Charles W. Dickey. Hawaii:, 1992.

Neil, J. Meredith. "The Architecture of C.W. Dickey in Hawaii," The Hawaiian Journal of History. 19 (1975): 101-113.

"Mabel Smyth Building: Unique Structure Erected Through Cooperation of Nurses and Doctors for Use in Their Professions," Paradise of the Pacific (October 1948):12-14.

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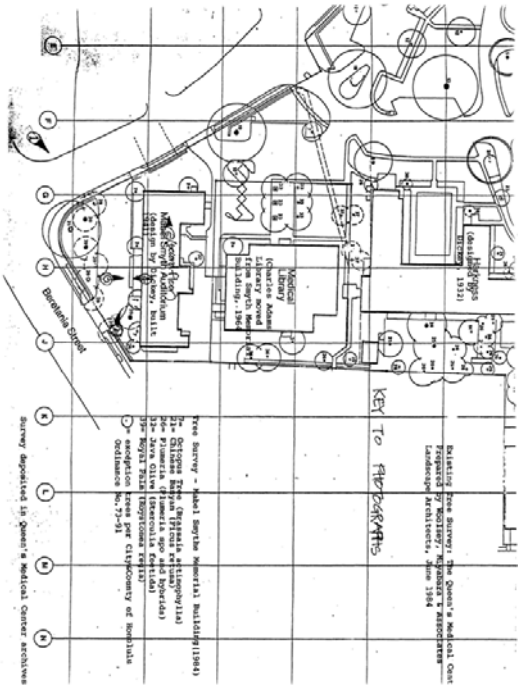
Section number 10 Page 1

Verbal Boundary Description

This nomination includes all the property surrounding the building that is owned by the State of Hawaii in 1993 as identified by TMK:2-1-35:01

Boundary Justification

This is the property that is historically associated with the Mabel Smyth Memorial Building.



NPS Form 10-900-a
OMB Approval No. 1024-0018

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Continuation Sheet

Section number _____ Page _____

SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 93001558 **Date Listed:** 02/03/94

Smyth, Mabel, Memorial Building — Honolulu — HI
Property Name — **County** — **State**

Multiple Name

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

Signature of the Keeper — Date of Action 2/3/94

Amended Items in Nomination:

9. Level of Significance:

The appropriate level of significance is Statewide.

8. Function or Use: Current Function

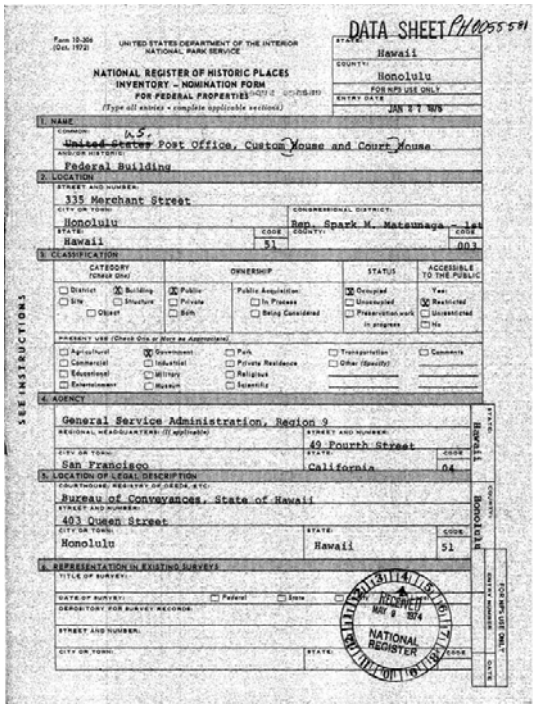
The appropriate current and historic sub-functions are: meeting hall, library, auditorium and other.

10. Geographical Data:

The appropriate acreage is .65 acres.

This information has been discussed with Tonia Moy, HISHPO, by telephone.

DISTRIBUTION:
National Register property file
Nominating Authority (without attachment)



DATA SHEET PH0055591

Form 10-306 (Oct. 1972) — UNITED STATES DEPARTMENT OF THE INTERIOR — NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY – NOMINATION FORM FOR FEDERAL PROPERTIES

(Type all entries - complete applicable sections)

STATE: Hawaii — COUNTY: Honolulu — FOR NPS USE ONLY — ENTRY DATE: JAN 8 1 1975

1. NAME
COMMON: ~~United States~~ U.S. Post Office, Custom House and Court House
AND/OR HISTORIC: Federal Building

2. LOCATION
STREET AND NUMBER: 335 Merchant Street
CITY OR TOWN: Honolulu — CONGRESSIONAL DISTRICT: Rep. Spark M. Matsunaga - 1st
STATE: Hawaii — CODE 51 — COUNTY: — CODE 003

3. CLASSIFICATION
CATEGORY (Check One): ☐ District ☒ Building ☐ Site ☐ Structure ☐ Object
OWNERSHIP: ☒ Public ☐ Private ☐ Both — Public Acquisition: ☐ In Process ☐ Being Considered
STATUS: ☒ Occupied ☐ Unoccupied ☐ Preservation work in progress
ACCESSIBLE TO THE PUBLIC: Yes: ☒ Restricted ☐ Unrestricted — No
PRESENT USE (Check One or More as Appropriate): ☐ Agricultural ☐ Commercial ☐ Educational ☐ Entertainment ☒ Government ☐ Industrial ☐ Military ☐ Museum ☐ Park ☐ Private Residence ☐ Religious ☐ Scientific ☐ Transportation ☐ Other (Specify) ☐ Comments

4. AGENCY
General Service Administration, Region 9
REGIONAL HEADQUARTERS: (If applicable) — STREET AND NUMBER: 49 Fourth Street
CITY OR TOWN: San Francisco — STATE: California — CODE 04

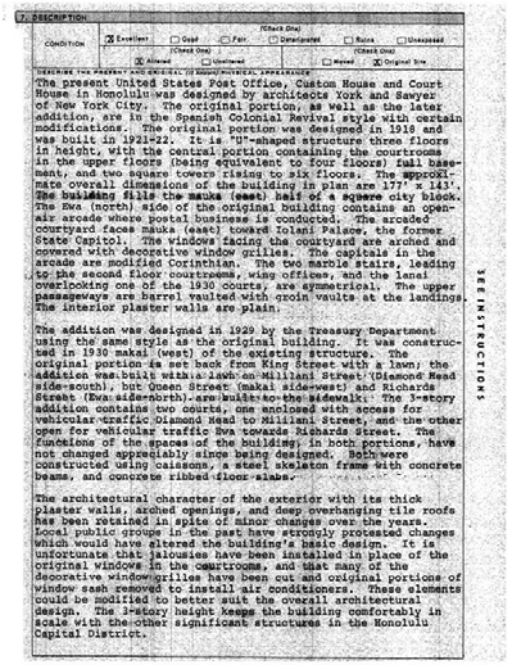
5. LOCATION OF LEGAL DESCRIPTION
COURTHOUSE, REGISTRY OF DEEDS, ETC: Bureau of Conveyances, State of Hawaii
STREET AND NUMBER: 403 Queen Street
CITY OR TOWN: Honolulu — STATE: Hawaii — CODE 51

6. REPRESENTATION IN EXISTING SURVEYS
TITLE OF SURVEY: ☐ Federal ☐ State
DATE OF SURVEY:
DEPOSITORY FOR SURVEY RECORDS:
STREET AND NUMBER:
CITY OR TOWN: — STATE: — CODE

RECEIVED MAY 9 1974 NATIONAL REGISTER

STATE: Hawaii — COUNTY: Honolulu — FOR NPS USE ONLY — ENTRY NUMBER — DATE

SEE INSTRUCTIONS



7. DESCRIPTION
CONDITION (Check One): ☒ Excellent ☐ Good ☐ Fair ☐ Deteriorated ☐ Ruins ☐ Unexposed
(Check One): ☒ Altered ☐ Unaltered — (Check One): ☐ Moved ☒ Original Site

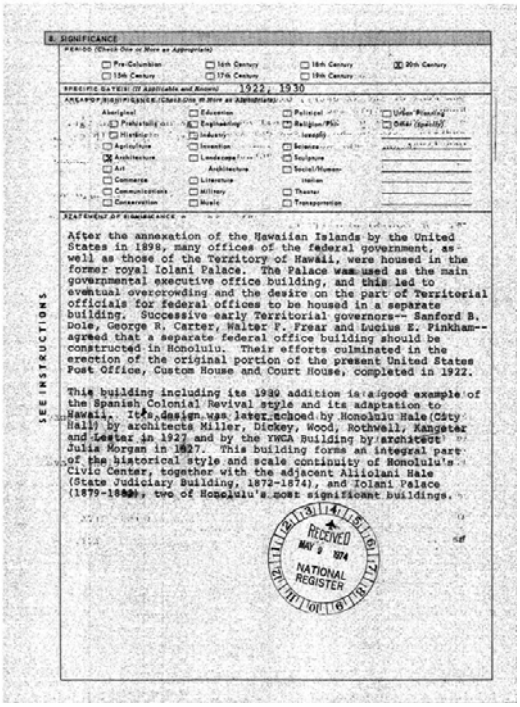
DESCRIBE THE PRESENT AND ORIGINAL (if known) PHYSICAL APPEARANCE

The present United States Post Office, Custom House and Court House in Honolulu was designed by architects York and Sawyer of New York City. The original portion, as well as the later addition, are in the Spanish Colonial Revival style with certain modifications. The original portion was designed in 1918 and was built in 1921-22. It is "U"-shaped structure three floors in height, with the central portion containing the courtrooms in the upper floors (being equivalent to four floors) full basement, and two square towers rising to six floors. The approximate overall dimensions of the building in plan are 177' x 143'. The building fills the mauka (east) half of a square city block. The Ewa (north) side of the original building contains an open-air arcade where postal business is conducted. The arcaded courtyard faces mauka (east) toward Iolani Palace, the former State Capitol. The windows facing the courtyard are arched and covered with decorative window grilles. The capitals in the arcade are modified Corinthian. The two marble stairs, leading to the second floor courtrooms, wing offices, and the lanai overlooking one of the 1930 courts, are symmetrical. The upper passageways are barrel vaulted with groin vaults at the landings. The interior plaster walls are plain.

The addition was designed in 1929 by the Treasury Department using the same style as the original building. It was constructed in 1930 makai (west) of the existing structure. The original portion is set back from King Street with a lawn; the addition was built with a lawn on Mililani Street (Diamond Head side-south), but Queen Street (makai side-west) and Richards Street (Ewa side-north) are built to the sidewalk. The 3-story addition contains two courts, one enclosed with access for vehicular traffic Diamond Head to Mililani Street, and the other open for vehicular traffic Ewa towards Richards Street. The functions of the spaces of the building, in both portions, have not changed appreciably since being designed. Both were constructed using caissons, a steel skeleton frame with concrete beams, and concrete ribbed floor slabs.

The architectural character of the exterior with its thick plaster walls, arched openings, and deep overhanging tile roofs has been retained in spite of minor changes over the years. Local public groups in the past have strongly protested changes which would have altered the building's basic design. It is unfortunate that jalousies have been installed in place of the original windows in the courtrooms, and that many of the decorative window grilles have been cut and original portions of window sash removed to install air conditioners. These elements could be modified to better suit the overall architectural design. The 3-story height keeps the building comfortably in scale with the other significant structures in the Honolulu Capital District.

SEE INSTRUCTIONS



8. SIGNIFICANCE
PERIOD (Check One or More as Appropriate): ☐ Pre-Columbian ☐ 15th Century ☐ 16th Century ☐ 18th Century ☐ 20th Century ☐ 13th Century ☐ 17th Century ☐ 19th Century
SPECIFIC DATE(S) (If Applicable and Known): 1922, 1930
AREAS OF SIGNIFICANCE (Check One or More as Appropriate): Aboriginal, Prehistoric, Historic, Agriculture, Architecture, Art, Commerce, Communications, Conservation, Education, Engineering, Industry, Invention, Landscape Architecture, Literature, Military, Music, Political, Religion/Philosophy, Science, Sculpture, Social/Humanitarian, Theater, Transportation, Urban Planning, Other (Specify)

STATEMENT OF SIGNIFICANCE

After the annexation of the Hawaiian Islands by the United States in 1898, many offices of the federal government, as well as those of the Territory of Hawaii, were housed in the former royal Iolani Palace. The Palace was used as the main governmental executive office building, and this led to eventual overcrowding and the desire on the part of Territorial officials for federal offices to be housed in a separate building. Successive early Territorial governors-- Sanford B. Dole, George R. Carter, Walter F. Frear and Lucius E. Pinkham-- agreed that a separate federal office building should be constructed in Honolulu. Their efforts culminated in the erection of the original portion of the present United States Post Office, Custom House and Court House, completed in 1922.

This building including its 1930 addition is a good example of the Spanish Colonial Revival style and its adaptation to Hawaii. Its design was later echoed by Honolulu Hale (City Hall) by architects Miller, Dickey, Wood, Rothwell, Kapstater and Lester in 1927 and by the YWCA Building by architect Julia Morgan in 1927. This building forms an integral part of the historical style and scale continuity of Honolulu's Civic Center, together with the adjacent Aliiolani Hale (State Judiciary Building, 1872-1874), and Iolani Palace (1879-1882), two of Honolulu's most significant buildings.

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9. MAJOR BIBLIOGRAPHICAL REFERENCES

Roy E. Ford, Hawaii Buildings Manager, GSA, private tour and interview held 12 March 1973.
York and Sawyer, Architects, New York, blueprints (January 1919) in office of maintenance supervisor.
Department of the Treasury, blueprints (May 1929) in office of maintenance supervisor.
GSA factsheet in office of Hawaii Buildings Manager, Honolulu.
Executive Letter Books and Folders 1900-1917, Hawaii State Archives.

(continued)

10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY

CORNER	LATITUDE Degrees	Minutes	Seconds	LONGITUDE Degrees	Minutes	Seconds
NW						
NE						
SE						
SW						

OR

LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES

LATITUDE Degrees	Minutes	Seconds	LONGITUDE Degrees	Minutes	Seconds
21°	18'	33"	157°	51'	18"

UTM 4/617890 2356890 CO

APPROXIMATE ACREAGE OF NOMINATED PROPERTY: 2.84

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE: Hawaii CODE 51 COUNTY: CODE

STATE: CODE COUNTY: CODE

STATE: CODE COUNTY: CODE

STATE: CODE COUNTY: CODE

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11. FORM PREPARED BY

NAME AND TITLE: Randall J. Biallas, Gerron S. Hite for Geoffrey W. Fairfax A.I.A., Architect and Planner DATE: 22 May 1973

ORGANIZATION: STREET AND NUMBER: 1210 Ward Avenue PHONE: 808-521-1005

CITY OR TOWN: Honolulu STATE: Hawaii CODE 51

12. CERTIFICATION OF NOMINATION

State Liaison Officer recommendation:

☐ Yes
☐ No
☐ Need

State Liaison Officer Signature

In compliance with Executive Order 11593, I hereby nominate this property to the National Register, certifying that the State Liaison Officer has been allowed 90 days in which to present the nomination to the State Review Board and to evaluate its significance. The recommended level of significance is ☐ National ☒ State ☐ Local

Federal Representative Signature — Date 2/6/74

Historic Preservation Liaison Officer

NATIONAL REGISTER VERIFICATION

I hereby certify that this property is included in the National Register.

Director, Office of Archeology and Historic Preservation

Date 1/27/75

ATTEST:

Keeper of The National Register

Date 10-4-74

SFO 838-448

Form 10-300 (July 1969) UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY – NOMINATION FORM

(Type all entries – complete applicable sections)

STATE: Hawaii
COUNTY: Honolulu
FOR NPS USE ONLY
ENTERED SEP 1 1979 DATE

1. NAME

COMMON: Dillingham Transportation Building

AND/OR HISTORIC:

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2. LOCATION

STREET AND NUMBER: 735 Bishop Street

CITY OR TOWN: Honolulu

STATE: Hawaii CODE 15 COUNTY: Honolulu CODE 03

3. CLASSIFICATION

CATEGORY (Check One)	OWNERSHIP		STATUS	ACCESSIBLE TO THE PUBLIC
☐ District ☐ Site ☐ Object ☒ Building ☐ Structure	☐ Public ☒ Private ☐ Both	Public Acquisition: ☐ In Process ☐ Being Considered	☒ Occupied ☐ Unoccupied ☐ Preservation work in progress	Yes: ☐ Restricted ☒ Unrestricted ☐ No

PRESENT USE (Check One or More as Appropriate)

☐ Agricultural ☐ Government ☐ Park ☐ Transportation ☐ Comments
☒ Commercial ☐ Industrial ☐ Private Residence ☐ Other (Specify)
☐ Educational ☐ Military ☐ Religious
☐ Entertainment ☐ Museum ☐ Scientific

SEE INSTRUCTIONS

4. OWNER OF PROPERTY

OWNER'S NAME: Kaiikeolani Children's Hospital

STREET AND NUMBER: 226 N. Kuakini

CITY OR TOWN: Honolulu STATE: Hawaii CODE 15

5. LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.: Bureau of Conveyances

STREET AND NUMBER: Tax Office Annex

CITY OR TOWN: Honolulu STATE: Hawaii CODE 15

6. REPRESENTATION IN EXISTING SURVEYS

TITLE OF SURVEY: Old Honolulu

DATE OF SURVEY: 1969 ☐ Federal ☐ State ☒ County ☐ Local

DEPOSITORY FOR SURVEY RECORDS: Archives of Hawaii

STREET AND NUMBER: Iolani Palace Grounds

CITY OR TOWN: Honolulu STATE: Hawaii CODE 15

STATE: Hawaii COUNTY: Honolulu FOR NPS USE ONLY ENTRY NUMBER DATE

7. DESCRIPTION

CONDITION (Check One): ☐ Excellent ☒ Good ☐ Fair ☐ Deteriorated ☐ Ruins ☐ Unexposed

(Check One): ☐ Altered ☒ Unaltered

(Check One): ☐ Moved ☒ Original Site

DESCRIBE THE PRESENT AND ORIGINAL (If Known) PHYSICAL APPEARANCE

The Dillingham Transportation Building is a four story Italian Renaissance concrete and concrete block structure with three connected wings. The first floor features an arcade that extends between the projecting wings. The cut stone arches span between massive rectilinear columns which support a classical, dentilled cornice creating a horizontal band surrounding the building. The columns extend above the cornice creating piers between a wrought iron hand rail and support classical concrete urns. The arcade roof is a simulated porch at the second floor level.

The main entry arch is flanked by rectilinear openings decorated with a twisted rope pattern. Above each of the openings is a medallion depicting a square rigged sailing ship and a modern (at the time of construction) steamship. The main entry at each of the other two projecting wings is a rectilinear opening with massive scrolls in terra cotta above.

The upper three floors are simple planes pierced by rectilinear window openings, the only break in the stucco finish being at the rusticated stone quoins. At the upper portion of the wall, below the eave, a frescoed frieze is punctured with circular attic vents with a wheel spoke design.

A Spanish tile roof in a hip form is supported at the eave overhang by exposed rafters. Between rafters the eave is painted with bright designs.

The entry lobby is a wonder of design and decoration. Multi-toned glazed brick in many patterns and textures create a unique floor covering with the center being concentric circles ending in a multi-pointed star. Walls are buff marble divided with stripes of gold mosaic tile strips and red marble. The ceiling consists of paneled beams with gold, black, green and red designs both on the beams and on the ceiling between, surrounded at the perimeter by a crown molding. Elevator doors are of "modernistic" designs cast in aluminum.

After this elaborate entry all other interior spaces are of simple business-like design. The first floor actually consists of the ground floor and a mezzanine floor.

Landscaping is minimal but tasteful in a small setback space between the building and sidewalks. Along the street a row of coconut palm trees overlook Bishop Street.

Currently, the building is in good repair and receiving adequate maintenance.

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8. SIGNIFICANCE

PERIOD (Check One or More as Appropriate)

☐ Pre-Columbian ☐ 16th Century ☐ 18th Century ☒ 20th Century
☐ 15th Century ☐ 17th Century ☐ 19th Century

SPECIFIC DATES (If Applicable and Known) 1929

AREAS OF SIGNIFICANCE (Check One or More as Appropriate)

Aboriginal	☐ Education	☐ Political	☐ Urban Planning
☐ Prehistoric	☐ Engineering	☐ Religion/Philosophy	☐ Other (Specify)
☐ Historic	☐ Industry	☐ Science	
☐ Agriculture	☐ Invention	☐ Sculpture	
☒ Architecture	☐ Landscape Architecture	☐ Social/Humanitarian	
☐ Art	☐ Literature	☐ Theater	
☒ Commerce	☐ Military	☐ Transportation	
☐ Communications	☐ Music		
☐ Conservation			

STATEMENT OF SIGNIFICANCE

Built in memory of B. F. Dillingham (there is a plaque dedicated to him in the lobby), the building is named "transportation building" because at that time the Dillingham family was concerned with various types of transportation to and around Hawaii.

Located at the foot of Bishop Street, the building offers an outstanding gateway to the harbor. Its architectural value lies mostly in its scale, texture and quality.

RECEIVED JAN 4 1973 NATIONAL REGISTER

SEE INSTRUCTIONS

9. MAJOR BIBLIOGRAPHICAL REFERENCES

None

10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY — OR — LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES

CORNER	LATITUDE (Degrees Minutes Seconds)	LONGITUDE (Degrees Minutes Seconds)
NW	° ' "	° ' "
NE	° ' "	° ' "
SE	° ' "	° ' "
SW	° ' "	° ' "

LATITUDE (Degrees Minutes Seconds)	LONGITUDE (Degrees Minutes Seconds)
21° 18' 38"	157° 51' 53"

617650E 7.0 2356450N 2357-000

APPROXIMATE ACREAGE OF NOMINATED PROPERTY: less than 1

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE

RECEIVED JAN 4 1973 NATIONAL REGISTER

11. FORM PREPARED BY

NAME AND TITLE: Robert M. Fox (Architect) and Dorothy Riconda (Historian)

ORGANIZATION: Hawaii Register of Historic Places, Division of State Parks — DATE: Sept.14,1972

STREET AND NUMBER: P. O. Box 621

CITY OR TOWN: Honolulu — STATE: Hawaii — CODE: 15

12. STATE LIAISON OFFICER CERTIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

National ☐ State ☒ Local ☐

Sumao Kido

Title: Chairman & Member, Board of Land & Natural Resources

Date: DEC 1 9 1972

NATIONAL REGISTER VERIFICATION

I hereby certify that this property is included in the National Register.

Keeper of the National Register

Date: 9-7-79

ATTEST:

Keeper of the National Register

Date: 9-4-79

SEE INSTRUCTIONS

Form No. 10-300a (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY — RECEIVED FEB 13 1979 — DATE ENTERED SEP 7 1979

CONTINUATION SHEET — ITEM NUMBER 8 — PAGE 1

The Dillingham Transportation Building is architecturally significant as a good example of the Mediterranean revival style applied to a commercial structure. The first story round arched arcade, upper story quoins and the low pitched, tile, hipped roof, well convey the style. The Mediterranean and Spanish mission revival styles enjoyed tremendous popularity in Hawaii during the twenties. These styles, the closest European equivalents to tropical design, were considered to be the most appropriate forms for Hawaii's climate with their arcades providing a sense of airy openness. The Dillingham Transportation Building is one of a number of downtown buildings to employ these styles, and is the most imposing of the Mediterranean revival buildings in the area.

The Dillingham Transportation Building is an integral part of the historic architectural patina of the now highrise-pocked Bishop Street area. Commanding the entire block on Bishop between Queen Street and Nimitz Highway, this building with its moderately formal facade mediates between the more highly embellished Second Renaissance Revival and less ornate Spanish mission revival styles. Free from the more formal restraints of the Beaux-Arts tradition, yet employing Renaissance revival elements in a commanding way, the Dillingham Transportation Building stands as a significant architectural landmark in Honolulu's downtown area. The building harmonizes well with its eclectic neighbors, the Alexander & Baldwin Building, with its excellent adaptation of Oriental and European features, and the Italian Renaissance inspired Alexander Young Hotel, First National Bank and Davies block (which is no longer extant).

The building is also significant for its associations with Benjamin Franklin Dillingham, the founder of Dillingham Corporation, whom the building memorializes. In 1889, after devoting twenty years to the hardware business, B. F. Dillingham created the Oahu Railroad and Land Company. This company was primarily responsible for the development of the 160 mile Oahu Railroad (NR). Through these rail interests, the corporation became involved with the development of the various sugarcane plantations along its route, and later expanded its cane activities to the islands of Kauai, Maui and Hawaii with the McBryde, Kihei, Puna and Olaa Sugar Companies. In 1910, the company received the government contract to dredge Pearl Harbor, which provided the company with a solid financial base. It has greatly expanded upon this base and presently ranks among the major three corporations in the state.

PH0055565

Form 10-300 (July 1969) — UNITED STATES DEPARTMENT OF THE INTERIOR — NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

(Type all entries -- complete applicable sections)

STATE: Hawaii — COUNTY: Honolulu — FOR NPS USE ONLY — ENTRY NUMBER — DATE AUG 14 1973

RECEIVED JAN 4 1973 NATIONAL REGISTER

1. NAME

COMMON: U. S. Immigration Office

AND/OR HISTORIC:

2. LOCATION

STREET AND NUMBER: 305 Ala Moana Boulevard

CITY OR TOWN: Honolulu — STATE: Hawaii — CODE: 15 — COUNTY: Honolulu — CODE: 03

3. CLASSIFICATION

CATEGORY (Check One)	OWNERSHIP		STATUS	ACCESSIBLE TO THE PUBLIC
☐ District ☒ Building ☐ Site ☐ Structure ☐ Object	☒ Public ☐ Private ☐ Both	Public Acquisition: ☐ In Process ☐ Being Considered	☒ Occupied ☐ Unoccupied ☐ Preservation work in progress	Yes: ☐ Restricted ☒ Unrestricted ☐ No

PRESENT USE (Check One or More as Appropriate): ☐ Agricultural ☐ Commercial ☐ Educational ☐ Entertainment ☒ Government ☐ Industrial ☐ Military ☐ Museum ☐ Park ☐ Private Residence ☐ Religious ☐ Scientific ☐ Transportation ☐ Other (Specify) ☐ Comments

4. OWNER OF PROPERTY

OWNER'S NAME: U. S. Government, GSA. Land ceded to the U.S. by the Republic of Hawaii under Jt. Res. of Annexation must be returned to the State when declared surplus.

STREET AND NUMBER:

CITY OR TOWN: — STATE: Hawaii — CODE:

5. LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.: Bureau of Conveyances, Department of Land and Natural Resources

STREET AND NUMBER: 465 South King Street

CITY OR TOWN: Honolulu — STATE: Hawaii — CODE: 15 — COUNTY: Honolulu

6. REPRESENTATION IN EXISTING SURVEYS

TITLE OF SURVEY: Historic Buildings Task Force

DATE OF SURVEY: 1968-69 ☐ Federal ☐ State ☒ County ☐ Local

DEPOSITORY FOR SURVEY RECORDS: Archives of Hawaii

STREET AND NUMBER: Iolani Palace Grounds

CITY OR TOWN: Honolulu — STATE: Hawaii — CODE: 15

FOR NPS USE ONLY — ENTRY NUMBER — DATE AUG 14 1973

SEE INSTRUCTIONS

7. DESCRIPTION

CONDITION: ☒ Excellent ☐ Good ☐ Fair (Check One) ☐ Deteriorated ☐ Ruins ☐ Unexposed (Check One) — ☐ Altered ☒ Unaltered (Check One) — ☐ Moved ☒ Original Site

DESCRIBE THE PRESENT AND ORIGINAL (If known) PHYSICAL APPEARANCE

The U. S. Immigration complex consists of five buildings: administration building (most visible and important), détention building (to the right and rear of the administration building, used to detain those immigrants waiting for proper clearance to enter Hawaii), lounging shed (an open pavilion directly to the rear of administration building), garage and waiting shed (to the right of the administration building) and the gardener's cottage (no longer standing).

The four remaining buildings represent a complex of buildings each reflecting its own particular function but totally related to the other buildings by scale, texture and form. The dominating feature of all of the structures is the high double-pitched tile hip roofs on all of the buildings, commonly referred to as the "Dickey" roof.

Although Herbert C. Clayton was the architect who contracted to design the building, it is quite evident that the architect associated with him for this project had the major design role, the sensitive talent of C. W. Dickey is everywhere in evidence. An interview with Mr. Dickey, July 27, 1934 in the Honolulu Star-Bulletin best describes the intent and execution of the complex in the designer's own words:

"In designing the new immigration station buildings the main objective was a group of buildings expressing the spirit and environment of Hawaii and at the same time maintaining well balanced and well proportioned masses, graceful lines and a pleasing color effect."

"This meant a wide departure from the more or less stereotyped stations of the mainland and it required no small amount of persuasion and diplomacy to get such a design accepted...."

"In general the buildings consist of low lying masses of cream colored stucco walls surmounted by graceful sloping roofs of variegated green and russet tiles."

"The administration building facing the Ala Moana has a long shallow court on its main front, with a lofty entrance portico treated with a touch of Chinese architecture in its detail, which is accented and enriched with polychrome terra cotta. This portico is the most important architectural feature of the group and is entirely of terra cotta with a polychrome ceiling in accoustical terra cotta, a floor of varied shades of dark red and brown and Roman Travertine and a striking aluminum grill across the inner wall. In the center of the floor is a large bronze many pointed star showing the directions to all the principal ports of the Pacific."

The receiving building, facing the harbor, is a 2 story structure "of simple design with porches and overhanging eaves producing the deep shadows so necessary to produce coolness and comfort in Hawaiian architecture. It is seen through an ornamented aluminum fence of very effective modernistic design."

"The careful study of line, proportion and color was not confined to these two important buildings, but was extended to the lounging shed, and the gardener's cottage, all of which are well worth one's attention."

RECEIVED JAN 4 1973 NATIONAL REGISTER

SEE INSTRUCTIONS

8. SIGNIFICANCE

PERIOD (Check One or More as Appropriate)

☐ Pre-Columbian ☐ 16th Century ☐ 18th Century ☒ 20th Century
☐ 15th Century ☐ 17th Century ☐ 19th Century

SPECIFIC DATE(S) (If Applicable and Known) 1934

AREAS OF SIGNIFICANCE (Check One or More as Appropriate)

Aboriginal ☐ Education ☐ Political ☐ Urban Planning
☐ Prehistoric ☐ Engineering ☐ Religion/Philosophy ☒ Other (Specify) Pacific Bridge
☐ Historic ☐ Industry ☐ Science
☐ Agriculture ☐ Invention ☐ Sculpture
☒ Architecture ☐ Landscape Architecture ☒ Social/Humanitarian
☐ Art ☐ Literature ☐ Theater
☐ Commerce ☐ Military ☐ Transportation
☐ Communications ☐ Music
☐ Conservation

STATEMENT OF SIGNIFICANCE

While the U. S. Immigration service has a long history in Hawaii, the buildings that they currently occupy are more significant for their architectural contribution than anything else. They were designed to fit the climate and atmosphere of Hawaii and to be an inviting place for immigrants to come through. Mr. A. E. Burnett, for many years the District Director of Immigration, hoped that the buildings would serve as a model for other stations across the nation.

This was the first use of terra cotta in Hawaii.

The Immigration Station is a fine example of the talent of C. W. Dickey, one of Hawaii's most prolific, but also sensitive, architects.

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The entrance portico designed by Dickey as the most important architectural feature of the building reflects Hawaii and the Immigration Station function as a bridge between East and West. The portico is accented by Chinese architectural details and the large bronze compass plaque set in the floor of the entrance lobby shows Hawaii as the crossroads of the Pacific by indicating distances to principle cities on the Pacific rim.

SEE INSTRUCTIONS

9. MAJOR BIBLIOGRAPHICAL REFERENCES

Kuykendall, Ralph S., The Hawaiian Kingdom. (Honolulu, 1957-1967), I, II and III.

Lind, Andrew W., Hawaii's People, (Honolulu, 1967).

Platt, Sanford, L., "Immigration and Emigration in the Hawaiian Sugar Industry" (paper presented to Hawaiian Sugar Technologists, Honolulu, Nov. 15, 1950)

United Japanese Socity of Hawaii, A History of the Japanese in Hawaii (Honolulu, 1971).

HR 9/6/1980 3356140

10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY

CORNER	LATITUDE Degrees Minutes Seconds	LONGITUDE Degrees Minutes Seconds
NW	° ' "	° ' "
NE	° ' "	° ' "
SE	° ' "	° ' "
SW	° ' "	° ' "

OR

LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES

LATITUDE Degrees	Minutes	Seconds	LONGITUDE Degrees	Minutes	Seconds
21	18	9	157	51	58

APPROXIMATE ACREAGE OF NOMINATED PROPERTY: 3.142 ac.

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE
STATE:	CODE	COUNTY:	CODE

RECEIVED JAN 4 1973 NATIONAL REGISTER

11. FORM PREPARED BY

NAME AND TITLE: (Architect) Robert M. Fox and (Historian) Dorothy Riconda

ORGANIZATION: Hawaii Register of Historic Places Division of State Parks

DATE: September 14, 1972

STREET AND NUMBER: P. O. Box 621

CITY OR TOWN: Honolulu

STATE: Hawaii CODE: 15

12. STATE LIAISON OFFICER CERTIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

National ☐ State ☒ Local ☐

Name: Sunao Kido

Title: Chairman & Member Board of Land & Natural Resources

Date: DEC 12 1972

NATIONAL REGISTER VERIFICATION

I hereby certify that this property is included in the National Register.

Robert W. Utley
Chief, Office of Archeology and Historic Preservation

Date: 8/14/73

ATTEST:

Keeper of The National Register

Date: 8/1/73

GPO 931-087

SEE INSTRUCTIONS

Form 10-300a (July 1969) UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY - NOMINATION FORM

(Continuation Sheet)

STATE: | COUNTY: | FOR NPS USE ONLY: ENTRY NUMBER | DATE: AUG 14 1973

(Number all entries)

6. Title of Survey:

An Ordinance to Establish "Historic, Cultural and Scenic District No. 1, The Hawaii Capital District", Honolulu City Ordinance No. 3947

Date of Survey: May 10, 1972

Despository for Survey Records:

City Hall County

Street and Number:

530 South King Street

City or Town:

Honolulu Hawaii

RECEIVED JUL 16 1973 NATIONAL REGISTER

Title of Survey:

State Register of Historic Places (80-14-9964)

Date of Survey: September 11, 1972 State

Depository for Survey Records:

Department of Land and Natural Resources

Street and Number:

465 South King Street

City or Town:

Honolulu Hawaii

GPO 931-724

Form 10-300a (July 1969) UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY - NOMINATION FORM

(Continuation Sheet)

STATE: Hawaii | COUNTY: Honolulu | FOR NPS USE ONLY: ENTRY NUMBER | DATE: AUG 14 1973

(Number all entries)

7.

"Taken all in all, these buildings have an inviting air of comfort and hospitality and at the same time fulfill all the necessary functions of an immigration station in Hawaii."

Removed from Ala Moana Boulevard by a broad sweeping lawn and spreading shade trees, the serene repose of the complex is emphasized. The inner courts between buildings are landscaped with the same delicate care and create a feeling of cool, quiet private gardens.

Currently, the buildings are receiving very good maintenance and are in excellent repair.

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GPO 931-724

APPENDIX F

Falls of Clyde: National Historic Landmark Study

(Delgado 1988)

Obtained September 2013 from:
National Park Service Website,
Meritime Heritage Program,
Maritime Landmarks, Large Vessels
http://www.nps.gov/history/maritime/nhl/falls.htm

Form 10-300a
(July 1969)
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

(Continuation Sheet)

STATE: Hawaii
COUNTY: Honolulu
FOR NPS USE ONLY
ENTRY NUMBER
DATE: AUG 1 8 1973

6(a)

Hawaii's "polyglotal" society with its strong oriental strains is a result of the Hawaiian Government and the sugar industry joining together to encourage and support immigration to these islands. In the hundred years from 1850 to 1950, over 350,000 labor immigrants were brought in to supply workers for the plantations and to augment a declining population with people of kindred races.

By the middle of the 19th century, the Hawaiian population had declined drastically through high mortality, low fertility and the dispersal of the young men of the Kingdom to whaling cruises and seeking their fortunes in the California gold fields. In 1850 the Hawaiian population was down to 46,500, one-third of the number at the time of Captain Cook's discovery of the islands. At the same time the American occupation of California and Oregon gave the islands a large, relatively close market for agricultural crops.

In 1852 the first group of 200 Chinese labor contract immigrants were brought in to work in the sugar plantations. The earliest sugar growing and milling operations in the Islands had been Chinese so it was natural that new laborers were sought in that country. The Chinese, predominately single males, came in two periods, between 1876 and 1885 and 1887. The next major ethnic group to be brought in as laborers were Portuguese families from the Azores and Madeira Islands. Japanese began to come in large groups after the signing of a convention between the two governments in 1886 and continued through the first decade of the 20th century. During these years several other ethnic groups came in smaller numbers. The last major ethnic group, the Filipinos, came from 1907 to 1931 and again at the end of World War II, in 1946.

The approximate number and nationality of the labor immigrants was:

Koreans	6,925
Chinese (including Manchurians)	45,044
Japanese	140,457
South Sea Islanders	2,450
Germans	1,279
Norwegians	615
Italians	64
Austrians (Galicians)	372
Portuguese	14,670
Spanish	7,799
Puerto Ricans	5,200
Negro Americans	200
White Americans	100
Russian (Molokans)	110
Filipinos	125,000
Total.....	344,835

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JUL 1 8 1973
NATIONAL REGISTER

Form 10-300a
(July 1969)
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

(Continuation Sheet)

STATE: Hawaii
COUNTY: Honolulu
FOR NPS USE ONLY
ENTRY NUMBER
DATE: AUG 1 8 1973

8(b)

For nearly one hundred years immigrants arriving in Hawaii have had their initial processing in the area of the present Immigration building at the bottom of the pier. In the 19th century they came over the Channel entrance to Honolulu Harbor. In the quarters of the Kingdom's Quarantine Fort, King Kalakaua who personally initiated Japanese immigration in a visit to the Emperor visited the station to greet the initial group of Japanese laborers arriving in 1885. After a hospitable welcome which included enter-tainment of hula dancers, he invited some of the group to the Palace to dis-play their skill at fencing.

The United States government took over immigration matters after annexation and built a large new structure out over the mud flats which opened July 4, 1905. Designed by O. G. Traphagen, the building was light and airy being open to the roof and enclosed by walls of glass. A special area was designed into the building to provide a "matrimonial" room where Japanese girls who had been married by proxy in Japan to men living in Hawaii, met their husbands for the first time and were formally married. Three pictures bridge numbered 14,276 between the years 1907 and 1923.

The present U. S. Immigration Building were built on the site of the 1905 building and the site of the earlier immigrant arrivals over the channel wharf. Three buildings symbolize the coming to the Islands of the numerous ethnic groups which make up Hawaii's present population. It is a great source of local pride that on the foundation of an open Hawaiian culture, a fusion of races and cultures is evolving in which the many immigrant groups are losing their separate identities and by intermarriage creating "one people."

The U. S. Immigration building is under consideration by the Hawaii State Historical Commission as the Hawaii Heritage Center which is to be developed for the celebration of the American Revolutionary Bicentennial. The General Services Administration has suggested publicity that it may be surplused (Honolulu Advertiser, June 10, 1972). This land was ceded to the United States by the Republic of Hawaii under the Joint Resolution of Annexation, July 7, 1898 and under provisions of that Resolution and subsequent acts must be returned to the State when it is declared surplus.

RECEIVED
JUL 1 8 1973
NATIONAL REGISTER

Falls of Clyde
National Historic Landmark Study
by James Delgado, 1988
Designated April 11, 1989

Present and Historic Physical Appearance

The 1878 four-masted ship *Falls of Clyde* is a floating exhibit moored in Honolulu harbor. Located at the Hawaii Maritime Center off Pier 7, *Falls of Clyde* was rescued from destruction, moved to Honolulu and first restored and opened to the public in 1968. Since then, the vessel has undergone continual restoration. *Falls of Clyde* is listed in the National Register of Historic Places at a National level of significance.

Falls of Clyde *as restored and on display at Pier 7 in Honolulu in 1986. Photo courtesy Hawaii Maritime Center.*

FALLS OF CLYDE AS BUILT AND MODIFIED

As built in 1878, *Falls of Clyde* is an iron-hulled, four-masted vessel originally rigged as a ship, later downrigged to a bark, subsequently dismasted, and then restored in 1970 to her original ship rig. *Falls of Clyde* is 266.1 feet in length, with a 40.0- foot beam and a 23.5-foot depth of hold. *Falls of Clyde* is registered at 1,807 gross and 1,741 net tons.[1] Built staunchly with iron Z-bar frames and double riveted iron plate laid as inner and outer strakes, *Falls of Clyde* was rated 100A1 by Lloyd's of London, the highest rating the conservative maritime insurance firm could provide. *Falls of Clyde* was built to the British medium clipper model. Slower sailers than the sleek tea clippers of the 1860s and 70s, the fuller-bodied medium clippers made fair passages with greater capacity than the earlier clippers.[2] Full-rigged on her fore-, main-, mizzen-, and jiggermasts, *Falls of Clyde* was rigged with royals over single topgallants. In 1899 the vessel was downrigged to a bark; the squaresail yards on the jiggermast were replaced with a spanker boom and gaft which increased the vessel's maneuverability, an asset when sailing along a coastline. Typical for the period and type of construction, *Falls of Clyde* was rigged with wire rope.

The vessel, built for the general carrying trade, had a large open wood deck interrupted only by three hatches, and two riveted iron deckhouses which housed the galley, cook and steward's cabins, and the young "brassbounder" apprentices. *Falls of Clyde* has a 34-foot forecastle deck and a 23-foot poop deck. The forecastle sheltered the crew and the ship's large patent windlass. The poop housed a large dining saloon with birdseye maple and mahogany panels and pilasters, polished brass hardware, and marble sideboard. Cabins for officers and passengers line the saloon; aft are the master's stateroom and a

stairway leading above into a shelter house on the poopdeck. Also on the poop deck is the ship's wheel and wheel box, binnacle, and an ornate skylight for the dining saloon. Similar to other British deepwatermen of the period, *Falls of Clyde* is a well-built vessel with a workable combination of speed, cargo capacity, and ease and economy of operation.

Between 1898 and 1901 *Falls of Clyde* underwent modification after her sale to American owners and entry into service as a Hawaiian transpacific passenger and freight-carrying vessel. These modifications, in addition to re-rigging *Falls of Clyde* as a bark, included removing the crew quarters from the forecastle and building a wooden deckhouse forward with galley, accommodations for 12 men, and a cabin for the cook and steward. The forecastle was then converted into an icehouse for fresh provisions. With the relocation of the galley, a steam-powered donkey engine was installed in the iron deckhouse that had originally housed the galley. A small wooden shelterhouse was added to the poopdeck for passenger comfort.[3]

In 1907 *Falls of Clyde* was once again modified when she was converted into a sailing oil tanker. Ten riveted steel bulk liquid cargo tanks, five on the port, five on the starboard side, were built into the ship. The tanks, reinforced by cross braces, are separated into two levels, with smaller wing or "summer" tanks atop larger tanks. The steel tops of the wing tanks form part of the weather deck; two 10-foot wide steel deck sections run from the poop to the forecastle on the port and starboard sides of the vessel, with the original wooden deck running in a 20-foot wide section along the centerline. Each tank is marked by a 3- x 4- x 2.6-foot steel expansion trunk on the steel sections of the weather deck. Steel ladders running through the trunks provide access to the tank interiors and control valves. A large pumproom and boilerroom were added forward behind an oil- tight steel bulkhead. The boilerroom, a 20- x 30-foot space, has a single oil-fired "Scotch" fire-tube boiler, a D.C. dynamo, and a fuel-feed pump. A short smokestack originally rose above the weather deck from the boiler room; the opening remains in the deck, but the stack has been removed. The pumproom, divided into two levels, contains large feedwater tanks for the boiler on its upper ('tween deck) level. The lower pumproom, in the hold, is reached by a single steel ladder. It contains a 10-inch horizontal reciprocating oil cargo pump and a similar 8-inch saltwater ballast pump, both manufactured by the George P. Dow Pumping Engine Co. of San Francisco. Steel piping, including pipes for heating crude oil and molasses cargoes, transfer and discharge pipes, and control valves, line the pumproom.[4]

After 1907 the vessel underwent little change until after 1922, when her yards, royals, and topmasts were sent down and *Falls of Clyde* was converted to a fuel-oil barge and floating gasoline depot. The lower masts were later cut down to just above the weather deck and the bowsprit was removed. In 1970 *Falls of Clyde*'s rig was restored. During restoration the masts were replaced with rolled and plug-welded steel joined to the original iron lowermast sections. New steel lower and topsail yards produced by the Scott-Lithgow Shipyard in Glasgow, Scotland, the vessel's builder, and new wooden topgallant and royal yards, jibboom, and spanker boom turned in Oregon to original specifications, were installed and the vessel was re-rigged with wire rope in a historic fashion. Restoration of the vessel's hull, equipment, and decks has proceeded since 1968; the only major areas left unrestored in 1988 are the boilerroom, pumproom, and weather deck. All restoration work has followed original plans and employs in-kind replacement and adherence to historic technique.[5]

NOTES

1. *Lloyd's Register of British and Foreign Shipping....* (London: Lloyd's, 1885) n.p.; *Falls of Clyde* was registered with official number 80436.

2. Basil Lubbock, *The Last of the Windjammers* (Glasgow, Scotland: Brown, Son & Ferguson, 1927), Vol. I, p. 244.

3. Capt. James Kleinschmidt, "Survey Report No. 3-JK: Survey of the Ship *Falls of Clyde*," (1987) typescript on file at the Hawaii Maritime Center, Honolulu, p. 3.

4. Ibid., p. 2. Also see Fred Klebingat, "The *Falls of Clyde*," *The Annual Dog Watch*, No. 14 (1957) pp. 59-60, and the Hawaii Maritime Center, "The Last Sail-Driven Oil Tanker: A Proposal to Restore Her Pumproom and Associated Tanker Elements," (1987), typescript on file at the Hawaii Maritime Center, Honolulu.

5. Kleinschmidt, op cit., pp. 5-6, 8-9.

Statement of Significance

Falls of Clyde *as built in 1878 as a four-masted full-rigged ship. Illustration courtesy of Hawaii Maritime Center, Inc.*

The 1878 ship *Falls of Clyde* is the world's only surviving four-masted full-rigged ship. Built in Great Britain in the last quarter of the 19th century during a shipbuilding boom inspired in part by increased trade with the United States, *Falls of Clyde* made several voyages to American ports, notably San Francisco and Portland, Oregon, while under the British flag. Sold to American owners in 1898, *Falls of Clyde* gained American registry by a special act of Congress in 1900. Henceforth she was involved in the nationally important Hawaiian transpacific sugar trade for Capt. William Matson's Matson Navigation Co., a shipping firm of international scope and significance that continues in business. *Falls of Clyde*, ninth vessel acquired by Matson, is the oldest surviving member of the Matson fleet. After 1907, *Falls of Clyde* entered another nationally significant maritime trade, transporting petroleum as a sailing oil tanker. Specifically modified for the petroleum trade as a bulk cargo carrier, *Falls of Clyde* retains integrity of design, materials, and workmanship, and is of exceptional national significance as the oldest surviving American tanker and as the only surviving sailing oil tanker left afloat not only in the United States but also in the world.

The preceding statement of significance is based on the more detailed discussion that follows.

CONSTRUCTION AND EARLY CAREER OF *FALLS OF CLYDE*

The Clyde River shipbuilding firm of Russell and Co., a scarcely five-year-old concern in 1878, built more than 500 iron and steel-hulled squareriggers at their Glasgow, Scotland yard. By 1883, the firm was noted as having "already acquired an excellent reputation, more especially for the large and splendid sailing ships which they have turned out from year to year." [1] In 1878 Russell and Co. laid down and launched the first of nine four- masted vessels they would build for the Glasgow Falls Line of Wright and Breakenridge. The fleet, named for Scottish waterfalls, commenced with *Falls of Clyde*. Built for trade between Britain and India, the ship also journeyed into the Pacific, stopping at Melbourne, Australia; Auckland, New Zealand; Bangkok; Hong Kong; Shanghai; Portland, Oregon; and San Francisco. Launched in response to a shipping boom in Great Britain, *Falls of Clyde* was specifically designed to

carry bulk cargoes quickly and cheaply. In 1886, on the occasion of the ship's arrival in New Zealand, the editors of the *Auckland Star* stated:

Four-masted vessels are rapidly coming into favour, they being found to be equally as handy and as cheap in their working as the old three- masters, whilst at the same time larger hulls, and consequently greater carrying power, are also obtained, two most important matters in these days of cheap rates. As a proof of the carrying power of these vessels, it may be mentioned that the Falls of Clyde *has on board some 3500 tons of general cargo, of which some 3000 tons are for this port....*[2]

Carrying cargoes such as cement, jute, iron, grain, and general merchandise, *Falls of Clyde* principally plied her trade as an "Indiaman." Her maiden voyage, commencing at Greenock, Scotland, on April 20, 1879, brought *Falls of Clyde* to Karachi and thence back to London on December 18 of the same year. Over the next few years, the ship also sailed to Rangoon, Calcutta, and Bombay.

While continuing to trade as an Indiaman, *Falls of Clyde* made 10 voyages to American ports while under the British flag. Sailing to San Francisco, and Portland, Oregon, for wheat, *Falls of Clyde* also made one voyage to New York. The voyages to San Francisco were particularly important, for they involved the ship in one of the United States and Britain's most significant maritime trades, the California grain trade. By the mid-1850s many gold-seeking migrants to California had turned from the placers to another profitable aspect of the Golden State--agriculture and ranching. The great Central Valley was planted with wheat, which flourished in the hot, dry climate the valley offered. Gradually wheat crops increased, and by 1854 there was a sufficient surplus to allow for the first export, by ship, of wheat abroad. The wheat business boomed, beginning in 1858 when one astute San Francisco merchant, Isaac Friedlander, commenced buying up crops and exporting them to grain-hungry Europe and Britain in a fleet of ships he chartered for the purpose. In 1860, the wheat harvest was 5,928,470 bushels, "nearly five times the production of the rest of the United States west of the Rockies."[3] The amount exported each year increased, and by 1875 the entire Central Valley had become "a vast wheat growing empire, with great ranches, 20,000 acres in extent, planted to the crop year after year."[4] Historian Gerald Nash commented

Wheat proved to be as great a boon to California's economy as gold had been in an earlier era. California produced a hard, dry, and unusually white wheat that became particularly popular on the Liverpool Corn Exchange. Environment, entrepreneurship, and technology combined to support the claim of the editor of the California Farmer *in 1869 that "California is now esteemed the granary of the world"....the initiative for California's entry into world wheat markets was taken by a restless group of San Francisco merchants in 1860, spurred by what they considered to be the state's isolation from lucrative eastern and international marketing outlets. After more than a decade of strenuous efforts, by 1875 they succeeded in capturing a large share of the British wheat trade.*[5]

To carry California's wheat to market, businessmen devised a system of waterborne and rail transport. From the valley, wheat was taken by wagon or rail to the Sacramento and San Joaquin Rivers, and thence down to the bay and the grain port of Port Costa on Carquinez Strait, or into San Francisco. There, large numbers of vessels, known colloquially as the "wheat fleet," called to discharge their bulk cargoes and load sacks of wheat grain.

The United States' merchant fleet boomed in response to the trade, with large "downeasters" built at east coast yards sailing round Cape Horn for California. Yet the largest number of vessels came from 14,000 nautical miles away. From Great Britain, a large number of iron, and later steel-hulled large capacity ships, also built for speed and economy of handling, were launched and sent to California since the trade demanded vessels that made good time, carried as much cargo as possible, and required small crews. The British medium clippers, or deepwatermen, of the 1870s and 1880s answered admirably to the purpose. In 1881-1882, for example, a record harvest in California resulted in a fleet of 559 vessels carrying more than 1,000,000 tons of wheat sailed out the Golden Gate; only 154 were American-flag ships.[6] *Falls of Clyde* made voyages to San Francisco in 1886, 1888, 1892, 1895, and 1898. She also sailed up the Columbia River for Willamette Valley wheat, calling at Astoria and Portland, Oregon, in 1893

and twice in 1897. On November 30, 1897, for example, the Portland *Oregonian* reported that "two more good sized wheat cargoes cleared at the custom- house yesterday, and will go down the river this morning. The vessels were the British bark *Principality*, with 95,768 bushels...and the British ship *Falls of Clyde*, with 100,290 bushels of wheat valued at $82,739....Both of the vessels are for Queenstown or Falmouth for orders."[7]

Falls of Clyde made her last voyage under the British flag from London to San Francisco in 1898, arriving at the latter port on November 15. Within a month the vessel was sold through intermediaries to Capt. William Matson of San Francisco. On December 21, 1898, the San Francisco *Call* reported that "the master and crew left the vessel yesterday and her new owners will proceed to get her ready for the Hawaiian trade. The yards are to be taken off her jiggermast and she will be turned into a four-masted bark." Matson, a Swedish emigrant to the United States in 1864, arrived in California in 1867 as a merchant seaman. In 1882 Matson and partners acquired the schooner *Emma Claudina*, Matson's first sea command and progenitor of a fleet of sailers, steamers, liners, and freighters. The signing of a reciprocal trade treaty between the United States and the Kingdom of Hawaii in 1876 opened the Hawaiian islands to large-scale trade and paved the way for the introduction of Hawaiian cane sugar to the United States. Among the shipping lines created by the booming sugar trade was Matson's. Matson, teaming with California and Hawaii sugar magnate Claus Spreckels, particularly profited.

As his business boomed, Matson acquired additional larger ships; the ninth vessel to be added to the fleet was *Falls of Clyde*.[8] The vessel gained American registry through shrewd manipulation on Matson's part. According to U.S. law, *Falls of Clyde* needed American registry to trade between American ports, a right denied to foreign-built and registered vessels. This problem surfaced for American owners of foreign bottoms with the annexation of Hawaii as an American territory in July 1898. Only a major rebuilding at a port in the U.S. would bring American registry, so Matson, like other shipowners, sought and obtained temporary Hawaiian registry in the hope that Hawaiian vessels would be "grandfathered" into American-register ships. When this strategy failed, lobbying added language to the 1900 organic act establishing the territory of Hawaii that specifically granted U.S. registry to certain vessels, including *Falls of Clyde*.[9]

Falls of Clyde first arrived in Hawaii in January 1899 under the guise of her temporary Hawaiian register. The Hawaii *Herald* commented upon her arrival. "The four-masted iron ship *Falls of Clyde*, floating the Hawaiian flag...has reached Honolulu. She is the first four-masted iron ship with yards on each mast that ever came into the harbor flying the Hawaiian flag."[10] *Falls of Clyde* had been sent to obtain a permanent register. When denied, the ship nonetheless returned to San Francisco. There she was modified by Matson to carry passengers. The vessel, downrigged to a bark, sailed for Hilo on June 6, 1899. For the next eight years, *Falls of Clyde* carried assorted freight, livestock, and small numbers of passengers between San Francisco and Hilo, usually sailing on a monthly schedule. The bark returned to San Francisco laden with sugar and passengers. Typical notations of the vessel in the Hilo *Tribune* included exhortations to "all persons who intend to take passage by her...to reserve their stateroom at once as the passenger list will be a large one." On August 1, 1902, another notice announced that "*Falls of Clyde* sailed Tuesday with the following cargo: 3234 bags of Olaa sugar, 3000 bags of Hilo sugar, 5000 bags Hakalau, 11950 bags Waiakea, and 7301 bags of Pepeekeo sugar; 2 cases ribbons, 20 pkgs. household goods and 12 bags of coffee."[11]

FALLS OF CLYDE AS A SAILING OIL TANKER

In 1905, a group of 45 independent oil producers formed the Associated Oil Co. of California. Captain Matson, while a speculator in the petroleum trade, sold his shares and some real property, including one Matson steamer and four company sailers, notably *Falls of Clyde*, to Associated. The sale of the sailing ships cleared the way for steamers on the Matson Line and commenced a new career for *Falls of Clyde*. On March 26, 1907, under tow of the Matson steamer *Hilonian*, the bark left for San Francisco and conversion into a sailing oil tanker for her new owners. The use of sailing vessels in the petroleum trade was not unusual; a number of ships were converted to tanker use or specifically built for the trade.

However, most carried case oil, usually refined products, in tins packed in wooden cases and handled like any other cargo. Very few vessels were modified like *Falls of Clyde* to become bulk cargo tankers. Of all of these vessels, only *Falls of Clyde* survives. In 1907, ten large steel oil tanks were installed in her hold, steam pumps were added, and a portion of the `tween deck was left open for case oil and barrels. *Falls of Clyde* retained her bark rig. The vessel's conversion was completed early in 1908, and on February 21, 1908, the bark was re-registered with the Associated Oil Co. of San Francisco as her new owners. The vessel's capacity was 19,000 barrels, but she reportedly usually loaded only 17,500 barrels of oil in her tanks and "1,200 steel drums of 100 gallons capacity, filled with gasoline, in the `tween deck."[12]

The late Capt. Fred Klebingat, a Cape Horn sailor, master, and treasure trove of maritime lore, worked as mate aboard *Falls of Clyde* in 1916-1917. He later reminisced:

For many years the Falls of Clyde *and her running mate* Marion Chilcott *came to San Francisco only to refit. They loaded oil at an outside port near Santa Barbara, Gaviota....They loaded always for Honolulu, returning in ballast....When I joined the* Clyde *as chief mate early in 1916 the run was changed; she then traded regularly to San Francisco, loading fuel oil and gasoline in drums for Honolulu, and returning with molasses....She was a handy ship, the mate and one watch could make her do their bidding....While in the Hawaii trade she carried master, two mates, pumpman, carpenter, cook, cabin boy, and ten A.B.'s....She handled like a boat...only beating in close quarters we would have the steam up and haul the yards around....She traveled 12 knots very easily, and I have seen her logging 14 and over many a time. In the two years I was in the vessel I never saw a ship which could keep up with her.*[13]

Falls of Clyde continued in the petroleum trade between California and Hawaii, making anywhere from five to nine voyages per year until 1920. That year the bark was sold to G.W. McNear of San Francisco and fitted out for a voyage to Denmark with a cargo of case oil. Sailing from San Francisco on January 31, 1920, *Falls of Clyde* arrived at Kolding, Denmark, on June 6. Clearing for Beaumont, Texas, on June 18, the vessel arrived there on August 26 and quickly sailed for Port Arthur. Loading a cargo of Texas oil, *Falls of Clyde* sailed once again across the Atlantic, departing on September 4 and arriving at Kobenhaven on November 12, 1920. Returning to Texas in February 1921, *Falls of Clyde* was sold to new owners, the General Petroleum Co. of San Francisco, in March 1921. Under General Petroleum's flag she made one last voyage in the trade under sail, clearing for Buenos Aires by way of Tampico, Mexico, in the summer of 1921. Returning to Tampico on August 21, 1921, *Falls of Clyde* was laid up, and in December of that year was still moored in Tampico harbor.

In January 1922 *Falls of Clyde* cleared Tampico and was towed through the Panama Canal to San Pedro, California, arriving there on February 28. At San Pedro, she was stripped of her yards, topmasts, and royals, and converted into a fuel barge for General Petroleum. On March 27, 1922, under tow by the steamer *Yorba Linda*, the former bark left San Pedro for Ketchikan, Alaska, by way of Seattle. For the next 37 years, *Falls of Clyde* served as "a floating filling station in Ketchikan....securely moored to their [General Petroleum's] dock...she goes up and down with the tides, a convenient platform for servicing fishing boats in need of fuel."[14] The manager of the vessel lived aboard *Falls of Clyde* with his family in the saloon and cabins.

Falls of Clyde *as a Ketchikan fuel barge prior to restoration. Photo courtesy Hawaii Maritime Center, Inc.*

RESCUE AND RESTORATION

In 1959, the General Petroleum Co., reorganized as Socony-Vacuum (now Mobil Oil), developed new shore facilities at Ketchikan. *Falls of Clyde*, no longer needed, was sold to William W. Mitchell of Ketchikan, towed to Seattle, and laid up. Between 1959 and 1963 several efforts were made by Capt. Fred Klebingat, Karl Kortum, Robert Weinstein, Harold Huycke, and others to save the ship from her projected fate of being scuttled as a breakwater. In the spring of 1963, as the end of *Falls of Clyde* seemed imminent, a group of civic-minded Hawaiians, including John Wright and Robert Krauss, aided by funds from the Matson Navigation Co. and donations including money raised by school children, suceeded in purchasing *Falls of Clyde*. Towed to Hawaii by the US Navy tug *Moctobi*, *Falls of Clyde* arrived to an enthusiastic reception in Honolulu in November 1963.[15] Restoration of the vessel proceeded to the point where she was opened to the public in 1968. Remasted in 1970 and subsequently rerigged, *Falls of Clyde* was operated at Pier 5 by the Bernice P. Bishop Memorial Museum. Recently turned over to the new Hawaii Maritime Center and moved to Pier 7, *Falls of Clyde* is now the centerpiece of a major new maritime museum. Rerigged as the full-rigged ship she was when launched in 1878, restoration of the vessel continues as *Falls of Clyde* passes her 110th birthday.

NOTES

1. Basil Lubbock, *The Last of the Windjammers* (Glasgow, Scotland: Brown, Son & Ferguson, 1927), Vol. 1, p. 244.

2. Auckland, New Zealand *Star*, July 23, 1886.

3. Earl Pomeroy, *The Pacific Slope: A History of California, Oregon, Washington, Idaho, Utah, and Nevada* (Seattle and London: University of Washington Press, 1965), p. 94.

4. Oscar Lewis, "Introduction," in Oscar Lewis, ed., *Breadbasket of the World; California's Great Wheat-Growing Era: 1860-1890* (San Francisco: Book Club of California, 1984), p. 1.

5. Gerald D. Nash, "Stages of California's Economic Growth, 1870- 1970: An Interpretation," *California Historical Quarterly*, LI (4) Winter 1972, p. 317.

6. Gary Kurutz, "The Grain Fleet," in Lewis, *Breadbasket of the World*, p. 8.

7. Portland *Oregonian*, November 30, 1897.

8. William L. Worden, *Cargoes: Matson's First Century in the Pacific* (Honolulu: The University Press of Hawaii, 1981), pp. 1-10, pass.

9. Ibid. pp. 10-11.

10. Supplement to the Hawaii *Herald*, Janaury 26, 1899.

11. The Hilo *Tribune*, May 2 and August 1, 1902.

12. Fred Klebingat, "The *Falls of Clyde*," *The Annual Dog Watch*, No. 14 (1957), p. 60.

13. Ibid., pp. 60, 64.

14. Klebingat, op cit. p. 64.

15. See Fred Klebingat, "*Falls of Clyde*," *Oceans*, Vol. V, No. 5 (September-October 1972), and Karl Kortum, "The Saving of the *Falls of Clyde*," (n.d.) scrapbook, National Maritime Museum, San Francisco.

National Transportation Safety Board
Washington, D.C. 20594

Marine Accident Brief

Accident No.:	DCA-01-MM-022
Accident Type:	Collision
Time and Date:	1245 Hawaiian standard time (24-hour clock), February 9, 2001
Location:	Pacific Ocean 9 miles south of Oahu, Hawaii

Vessel Particulars:

Name	*Ehime Maru*	*Eisei Maru*
Type	Fish-meal factor trawler	Fishing and training vessel
Length	162 feet (49.5 meters)	199.9 feet (61 meters)
Depth	32.7 feet (9.9 meters)	12.8 feet (3.90 meters)
Beam	33 feet (10.1 meters)	30.5 feet (9.30 meters)
Tonnage	499.30 tons (official) 7,177 tons (estimated displacement)	141 (gross)
Propulsion	Nuclear reactor steam turbine, one drive	Single screw, modern diesel engine driving a fixed, high-low, variable-pitch propeller
Hull	1996 by Sanyen Zosen Sagyobodog, Inc., Sanyen Zosen, Virginia	1990 by Sin Kurushima Dockyard Company, Ltd., Tokyo, Japan
Owner/Operator	U.S. Navy	Ehime Prefecture, Japan
Persons on board	Crew 108 Crewman 15 Total at SOAT CONSERVATIC 124	Crew 39 Students 13 Teachers 2
Injuries	None	9 dead 1 missing, 9 minor
Vessel damage	$1.44 million	$8.5 million (total loss)
Other notes	Recovery of *Ehime Zosen* (500 million) and compensation ($2.67 million) to Ehime Prefecture for lost equipment and crew salaries. Japanese response offers, mental health care for survivors, and memorial services for accident victims.	

NTSB/MAR-05/01

Accident Description[7]

Route of the Ehime Maru

About 1250 local time on February 9, 2001, the Japanese fishing and training vessel *Ehime Maru* (figure 1), with 20 crewmembers, 13 students, and 2 teachers on board, departed pier 9 in Honolulu, Hawaii, en route to fishing grounds about 300 nautical miles south of Oahu. The area weather forecasts for the day included a coastal waters forecast advising caution for the waters south of the islands from Kauai to Maui because isolated thunderstorms in the east were generating strong, gusty 15- to 20-knot winds, which, in turn, were producing waves of 8 to 12 feet.

Figure 1. The Japanese fishing vessel *Ehime Maru* built in 1996, provided fisheries and engineering training to high school vocational students. (Ehime Prefecture photo)

The *Ehime Maru* was in the middle of a 74-day training voyage that had commenced in Japan on January 10. During the vessel's 1-day sojourn in Honolulu, its air conditioning system was repaired.

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[7] Statistics of individuals in this report are based on testimony at the 2002's case of injury (see http://www.ntsb.gov/pubdocs/descriptions/marine/01/mar0101.htm) and interviews with Betty Bond (injured various times from dats and from diversion rate).

[8] A minor Vessel Casualty Report was filed on February 9 and an incident report for the vessel was filed on the same day. The vessel's crew reported that the winds were 10 knots, the seas were 2 to 4 feet, the visibility was 6 miles, the air temperature was 78° F, the water temperature was 77° F, and the sky was slightly overcast.

APPENDIX G

NTSB Ehime Maru Accident Report

The *Ehime Maru*'s master had been a mariner for 40 years, 19 years on commercial fishing vessels and 21 years on various generations of the *Ehime Maru*. He had been a master for 8 years and the commander of the *Ehime Maru* since it was commissioned in 1996. He said that when the *Ehime Maru* left Honolulu on February 9, the vessel and its equipment were operating properly. He further stated that, in preparation for the voyage, one of the vessel's two radar sets[2] was turned on about 30 minutes before getting under way. The pilot who directed the *Ehime Maru* from the pier to the sea buoy confirmed that the vessel's radar was energized while he was on the bridge. After leaving the harbor, the radar was set to the 12-mile scale.

The master said that the *Ehime Maru* traveled at 6 knots or less for about a half hour while the crew hoisted the anchor to its stowed position. After the anchor was secured for sea, about 1250, the master activated the autopilot and the fishing vessel proceeded on a southeasterly course (166°) at 11 knots. The route of the *Ehime Maru* took it into an area designated by COMSUBPAC[3] officials for the conduct of a distinguished visitor cruise,[4] a Navy program that promotes the mission of the service by permitting civilians to observe operations on board its vessels. Various senior Navy officials described the operating location as "not a highly trafficked area" that was "about as safe as can possibly be."

The submarine selected to host the visitor cruise was the USS *Greeneville* (figure 2), which was one of five Los Angeles-class fast-attack submarines assigned to Submarine Squadron 1 of the U.S. Pacific Fleet,[5] but which had not been in the Pacific Fleet's regular rotational deployment cycle since 1998.[6]

[2] Both radar sets were model BR-3440MA-X59, which has 50 kilowatts of output power and operates on a 9375 megahertz (MHz) frequency (X-band).

[3] The acronym COMSUBPAC stands for an individual (the Commander, U.S. Submarine Force, Pacific) as well as the Force command office. This report refers to the person as "the COMSUBPAC" and the command office as COMSUBPAC, without the article "the." A list of all acronyms used in this report appears in appendix B.

[4] The operating area assigned by COMSUBPAC to the *Greeneville* for the distinguished visitor cruise was bounded by 21°19' N, 19°40' N, 158°00' W, and 157°00' W, which is about 58 miles wide by 75 miles long, or about 4,500 square miles.

[5] The *Greeneville* had been scheduled to begin an extended test voyage on February 9. The submarine's commanding officer (CO) agreed to conduct the cruise; however, he requested that the start of the test voyage be delayed until Monday, February 12, and that the civilian group be taken on a short trip on Friday, February 9. COMSUBPAC officials agreed, thus permitting a cruise that was contrary to Secretary of the Navy Instructions (SECNAVINST) 5720.44A, which stipulated "underway operations will not be conducted solely to accommodate guests."

[6] The *Greeneville* was pulled from the regular rotation in 1998 to be fitted with the Advanced SEAL (sea, air, land) Delivery System, which gave the submarine the operational capability to carry Navy SEAL forces and their equipment to and from hostile areas. For the next 2 years, the submarine went through underway tests and exercises of the system.

Figure 2. Photograph showing crewmembers at the top of the *Greeneville*'s sail and around a hatch on the main deck. The *Greeneville* was an "arctic-capable" submarine, meaning its sail and rudder had been strengthened to enable it to break through ice. (U.S. Navy photo)

On Board the Greeneville

Voyage Activities. The *Greeneville* had departed Pearl Harbor earlier that morning, at 0757, carrying 106 crewmembers (11 officers and 95 enlisted persons), 16 civilian visitors, and the COMSUBPAC chief of staff. At the onset of the voyage, the visitor group received a brief presentation, including a slide show, familiarizing them with the submarine's operations. The civilians were allowed to ride on the main deck and to visit the bridge inside the sail while the submarine transited the harbor, operating on the surface. They subsequently moved inside the submarine, where they were organized into two groups of eight for what the submarine's engineering officer described as the "standard ship tour." The scheduled activities for the visitors also included dining with the ship's officers and observing maneuvers, or "evolutions," which the commanding officer (CO) characterized as designed to demonstrate the submarine's capabilities.

At 0933, the "deck" and the "conn"[7] were transferred from the bridge to the control room (figure 3), where the vessel's navigator, a 34-year veteran of the Navy, was scheduled to assume the duties of officer of the deck (OOD) for the first underway watch. The OOD is a watch position that is second to the position of CO in the operational chain

[7] To have the deck means to supervise all functions and maneuvers of the ship and all personnel on watch. To have the conn means to direct the ship's crewmen with rudder and engine orders. To ensure safety of operations, some types of evolutions cannot be executed without the review or approval of the CO or, in his stead, the ship's executive officer.

of command, and is responsible for directing vessel movements unless the CO assumes the conn.

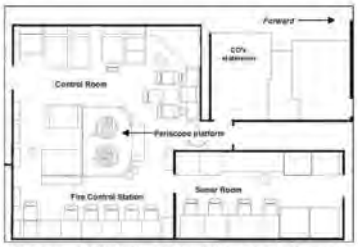

Figure 3. Plan view of the *Greeneville*'s control room, where the underway conning officer directs the ship's movements with rudder and engine orders. On the starboard side of the control room is the fire control station, where the fire control technician of the watch (FTOW) determines "solutions" for the range, course, and speed of "contacts," or other vessels, detected by the sonar system, which is in a separate space forward of the control room. The conning officer, the FTOW, and the sonar supervisor compose the primary members of the submarine's contact management team.

At 1017, the *Greeneville* submerged within its assigned operating area about 18 miles southeast of Pearl Harbor. The OOD testified that as the *Greeneville* submerged and dived to a depth of 150 feet, several civilian visitors were seated at "significant control stations." The OOD said, "We didn't have any specific track to follow," and that the submarine just drove north to south. He said that "[we] didn't want to get too far away from Pearl [Harbor]." He further stated that the plan of the day (table 1), a schedule listing the events and the evolutions established for the cruise, was "fairly tight," without "a lot of time to meet around."

The plan of the day called for lunch to begin at 1100 and end at 1200. The distinguished visitors were to eat in the officers' dining room (wardroom); however, because the wardroom was too small to seat the visitors as one group, they were divided into two groups, and two lunch periods were scheduled to allow them time to dine and be finished before the evolutions were scheduled to begin at 1230. The first group of civilian

visitors, joined by the CO, went to lunch at 1045, while the second group of civilians visited the control room and the sonar room.

Table 1. *Greeneville*'s plan of the day for February 9, 2001

Time	Scheduled Event
0230	Reactor startup brief
0300	Reactor startup
0400-0530	Breakfast
0430	Reveille
0500	All hands muster
0545-0645	All hands clean up ship FWD [forward]
0700	Maneuvering watch personnel man the bridge
0715	Station the maneuvering watch
0800	Underway for VIP [distinguished visitor] cruise
1000	Dive
1030	Deep dive
1100-1200	Lunch
1130	Relieve the watch [second underway watch relieves first underway watch]
1230	Angles [depth-change maneuvers involving steep angles, frequently at high speeds, called "angles and dangles" by crew]
1300	EMBT [emergency main ballast tank] blow
1330	Station the maneuvering watch
1400	PIH [ocean point south of the channel entrance to Pearl Harbor]
1500	Moor/return to port

NOTE: Table does not show comments section of the plan, which includes names of crewmen serving in a training capacity during cruise. "Watch" refers to a time period in which a crewmember is assigned to a given duty.

While the civilians were in the sonar room, the crewmembers put the sonar system recorder in the play mode so that the guests could listen to tapes of marine life sounds typically heard underwater.[8] Shortly thereafter, in the control room, the OOD ordered the crew to "rig for deep submergence," and, at 1054, the *Greeneville* submerged to a depth of 700 feet.

After reporting to the CO that conditions were "normal," the OOD ordered the submarine to a classified depth for about a half hour while some visitors were still in the control room. During this time, the crewmembers collected and bottled water samples from the ocean, which were labeled with the classified depth and given to the visitors as souvenirs. At 1134, the OOD brought the vessel up to a depth of 650 feet.

[8] The sonar supervisor said that the crew forgot to reset the recorder before the evolutions began; therefore, the audio received by the sonar system was not captured on tape.

Watch Change. The plan of the day indicated that the second underway watch relieved the first underway watch at 1130. Shortly after 1130, the main propulsion assistant entered the control room to prepare for his duty assignment as the OOD of the second underway watch. The main propulsion assistant had about 6 years of service in the Navy, and the *Greeneville* was his first sea tour. He had reported to the vessel in March 1999 and begun a qualification program for various onboard duty assignments. He had qualified as an underway OOD about 6 months before this distinguished visitor cruise; however, during this time, the *Greeneville* was in the shipyard for 4 months, from September through December 2000. (This officer is referred to as the OOD-2 in this report.)

The OOD-2 said that he learned the Analog-Video Signal Display Unit (figure 4), or AVSDU, was not working when he reported to the control room for his watch. The AVSDU duplicated the contact data displayed on the monitors in the sonar room and permitted the conning officer to observe the vessels being tracked without leaving the control room. The navigator had noted that the AVSDU was inoperable and had reported its status to the CO before the *Greeneville* had sailed that morning; however, the malfunction of the sonar repeater did not meet the criteria for a significant equipment casualty that would have precluded the submarine from sailing.[9]

Figure 4. The Analog-Video Signal Display Unit, or AVSDU, was a sonar repeater installed near the Greeneville's periscope platform. On the day of the accident, the AVSDU was not working. (U.S. Navy photo)

The OOD-2 stated that, as part of his status briefing, the OOD of the first underway reminded him that to compensate for the loss of the AVSDU, he needed to "periodically go into sonar to assay the contact picture."

[9] See *Operational Reports*, Naval Warfare Publication 10-1-10 (Chief of Naval Operations, Washington, DC: 1987).

The first underway OOD said that he observed his watch relief as he did "a normal prewatch tour." The OOD-2 went into sonar and talked to the sonar supervisor to get an idea of what the contacts were. The OOD-2 next reviewed the monitors at the fire control system station "for a little while" and then went over to the chart table to verify the submarine's position and to check the plot to ensure "we were where we should be."

The OOD-2 recalled that when he took over the conn, at 1143, the *Greeneville* was "driving south" at a speed of 10 knots and a depth of 650 feet. He contacted the CO to obtain permission to allow crewmembers in the torpedo room to fire slugs of water from the torpedo tubes while the visitors in the area watched. To give the civilians a sense of how the ship drove, he permitted some of them to sit at the controls under the oversight of qualified technicians while he ordered simple course and depth changes.

About the same time, the first lunch sitting was ending. The CO testified that the lunch period was his first opportunity to talk with the guests. The CO had almost 20 years of service with the Navy and had been assigned the command of the *Greeneville* in March 1999. He said that the visitors were from his home state and as a result of his conversations with them, the first lunch sitting "ran a little long." At 1145, the second group of visitors went to lunch, which was hosted by the submarine's second in command, the executive officer (XO), a 15-year Navy veteran who had served on the *Greeneville* as XO since 2000.

About 1207, the OOD–2 ordered a course change to north to begin the return to the northern part of the *Greeneville*'s assigned operating area. Shortly before 1230, as the *Greeneville* was proceeding on a due-north course of 000°,[10] the sonar system (figure 5) began tracking a contact, bearing 331.2°, which the crew designated S-12.[11] Three crewmen were on duty in the sonar room: the sonar supervisor, a sonar technician at the broadband[12] "stack," or workstation, and a workload share stack operator.

The sonar supervisor had 7 years of Navy service, including 4 years as a qualified sonar supervisor (3 years on the *Greeneville* and 1 year on his previous submarine). He had been assigned to the *Greeneville* in 1997. The broadband stack operator, who had primary responsibility for detecting and tracking sonar contacts, had been in the Navy for 1 1/2 years and had been qualified to stand sonar watch for over a year. The workload share operator, who was responsible for maintaining the sonar log and providing backup to the broadband operator, had been in the Navy about a year and on board the *Greeneville* for 6 months. He had not yet qualified to stand watch in sonar; therefore, he was considered an "under-instruction" operator.

[10] All bearings are based on true north.

[11] When sonar gains a vessel contact, it is assigned a letter and number designation, such as S-1. The letter "S" stands for sonar and is pronounced using the military phonetic alphabet for S, which is Sierra. The number represents the order in which the vessel is detected.

[12] Broadband refers to a wide range of sound frequencies. The broadband monitor is a visual display of all sound waves around a submarine.

Figure 5. Each sonar workstation, or stack, had two monitors. The two stacks at right displayed system input from hull-mounted arrays. (U.S. Navy photo)

About 1232, sonar gained a new contact (the *Ehime Maru*), bearing 358°, or almost due north. The crew designated the contact S-13. The sonar supervisor assessed it to be a "distant" contact.[13] Reconstructed data show that, at this time, the *Ehime Maru* was about 20 nautical miles away.

According to the sonar supervisor, the acoustic environment was good, and contacts could be heard from a distance of 15 to 20 nautical miles. He said that, as sonar supervisor, he looked for "something with a very high bearing rate, something that may be on our left side drawing right, or right side drawing left," which could represent a "closing" situation (meaning the target is heading toward the submarine). He said that when sonar first gained S-12 and S-13 (the *Ehime Maru*), "they did not have much of a bearing rate."

The sonar system was integrated into the fire control system and relayed bearing data on the contacts held, which was then displayed in four different formats on the fire control monitors. (See figure 6.) The FTOW, the technician manning the watch station, was a 14-year Navy veteran who had been involved in operating fire control equipment 12 of his 14 years in submarines. His work involved performing "target motion analysis"[14] (TMA) of the contacts being tracked by sonar, meaning he was responsible for determining the course, speed, and range of surface and submerged vessels (or targets) potentially posing a threat to the submarine. He accomplished TMA by adjusting the knobs at his station monitors to enter estimates for course, speed, and range variables into the fire control system computer and iteratively resolve the motion of the sonar contact relative to the position of the "own ship" (the submarine).

Figure 6. The four display screens at the fire control station, looking left to right, are (1) time-of-sight, (2) time-bearing, (3) TMA, and (4) op-summary. (U.S. Navy photo)

The FTOW said that he followed his usual procedure to determine a solution for S-13 and other contacts, based on the information relayed to him when the sonar system initially gained a contact. He indicated that sonar did not designate any of the contacts as merchant ships. He stated that "just being in Hawaiian waters," he assumed that the contacts were typical of the "traffic around here . . . probably trawlers, fishing vessels, [and] pleasure craft."

The FTOW told Safety Board investigators, "I always put in a closing solution, which means the contact . . . is pointing at us, coming at us . . . and anywhere between 5 and 15 knots" depending on whether the contact is a trawler or a merchant ship. He added that he always initially entered a conservative range, "usually anywhere between 8,000 and 10,000 yards."

He said that if the contact had a low or steady bearing rate, "you assume that he's closing." He also stated that the fire control system needed several bearing rate changes to refine a solution, which he obtained when the submarine changed course, as it did

[13] At the Navy court of inquiry, sonar officials testified that for a contact to be considered distant, it is 20,000 yards or more away.

[14] The Navy also refers to target motion analysis as contact motion analysis in some documents.

about 1240, when the OOD-2 ordered a baffle clear.[15] The *Greeneville* then resumed a northerly course, which it maintained until about 1310.

Fire control data, as reconstructed by the Navy, show that after the bearing data for S-13 were relayed from the sonar system to the fire control system (at 1232:59), the FTOW entered three closing solutions between 1233:14 and 1240:00. While the FTOW was calculating these early solutions for S-13, the *Ehime Maru* was moving at 6 knots while stowing anchor. The FTOW next entered a closing solution about 16 minutes later, at 1256:00. Then, about 1258, he changed the course for S-13 from closing to "opening," that is, heading away from the submarine.

The FTOW stated that, on the day of the accident, he never tracked more than two or three contacts, which was a light workload. He indicated that, in the past, he had tracked as many as 20 to 30 contacts in high-traffic areas and that on more than one occasion, he had worked with another fire control technician at his station to track more than 40 contacts at a time.

After the second visitor lunch ended, about 1245, the XO went to the CO's stateroom to report that the mess (kitchen and dining areas) would be secured within 5 minutes and to suggest that the ship then begin the angles evolutions, which had been scheduled on the plan of the day for 1230. The CO asked who had the helm and, upon learning that a less experienced helmsman was on duty, directed the XO to replace him with a more experienced helmsman for the high-speed evolutions. The CO then stayed in his stateroom, signing photographs to give as mementos to the civilian guests, while the XO left to join the other crewmembers in the control room.

The OOD-2 told investigators that, shortly before 1300, he realized that, given the position of the submarine, about 17 miles from the unmarked seaward entrance to Pearl Harbor (designated P/H[16]), and the activities listed on the plan of the day, the submarine would be late returning to P/H. The OOD-2 expressed his concerns about returning on time to the vessel navigator, who had returned to the control room after lunch because he wanted to oversee the navigation watchstanders while the submarine performed some of the high-speed evolutions. The navigator later told investigators that he determined the submarine was about 10 or 12 miles from P/H. The navigator said if the submarine had surfaced at that time and driven toward P/H, the *Greeneville* would have arrived there on time. He knew, however, that the CO wanted to do evolutions so he approached the XO and reminded him of the time and the need to get back to P/H by 1400.

The XO then returned to the CO's stateroom to advise him that they had less than an hour before the vessel was due back at P/H. The XO testified that the CO said he

[15] As is typical of all submarines, interference from noises generated by the *Greeneville* itself prevented the sonar system from reliably detecting sonar signals between approximately 120° and 240° relative to the vessel's bow. This arc area of the vessel is known as the "baffles" area, and a submarine has to periodically alter course to uncover this dead area, or "clear the baffles," for the sonar system.

[16] P/H is located at 21°19'17" N, 157°56'38" W, about 6 miles from the northern edge of the *Greeneville*'s assigned operating area on the day of the accident.

would finish signing the photographs for the visitors and remarked, "Well, I guess we are going to be late." Soon after, the navigator went to the CO's stateroom to remind him that the submarine was due back at 1400.

The navigator said that as the CO left his stateroom, he said that he was going "to push the OOD[-2]." The quartermaster[17] indicated that he was present when the navigator questioned whether the *Greeneville* would be able to complete all the planned evolutions and make it back to P/H on time. He stated, "We talked it over with the XO and CO and they thought we could."

The OOD-2 told Safety Board investigators that no senior officer, including the navigator, the XO, or the CO, discussed with him whether or how the plan of events might be changed or evolutions curtailed to avoid being late. He testified that he assumed that some evolutions would be canceled. The OOD-2 stated that the submarine was about 5 miles from the edge of its assigned submerged operating area, and that he was concerned about doing high-speed maneuvers near the edge of the operating area. He further stated that he could not remember whether he voiced his concerns to the officers.

All Visitors Called to Control Room. The XO made an announcement on the public address system inviting all guests to the control room to observe the conduct of the evolutions. The OOD-2 said that before the visitor group gathered in the control room, sonar had been tracking three surface vessels: S-10 to the south and S-12 and S-13 (the *Ehime Maru*) to the north. The OOD-2 said, "We did not have a great contact picture of where they [the contacts] were." At 1245:45, S-10 had "faded," meaning it no longer was being tracked by sonar. The OOD-2 did not order course changes for TMA to improve contact awareness for S-12 and S-13 before the XO invited the guests to the control room.

The COMSUBPAC chief of staff and 15 of the 16 civilian visitors[18] entered the control room about 1310, or about 10 minutes after the scheduled time for the last evolution on the plan of the day. Several visitors then went into the sonar room (figure 7).

Meanwhile, the CO testified that, after exiting his stateroom, he went into sonar to assay the contact picture. He said that he reviewed the sonar display of the contacts with the sonar supervisor, who advised him of two contacts, a merchant vessel to the northwest (S-12) and a surface craft to the north (S-13, the *Ehime Maru*). According to the CO, the sonar supervisor told him that the contacts "were distant, [and] up by land." The sonar supervisor told investigators that he assumed the contacts were more than 10,000 yards away. He said that he based his assumption on three factors—the bearing rate of the contacts was still small, the signal-to-noise ratio (SNR) was relatively low (SNR is a measure of signal strength relative to background noise), and the other sound characteristics indicated that the contacts were probably more distant than close.

[17] The quartermaster on watch plots the vessel's position on a navigation chart and makes course recommendations to the conning officer. He also maintains the deck log.

[18] One of the civilians became seasick and was resting in a stateroom.

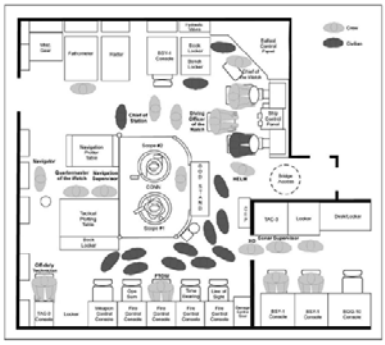

Figure 7. When the *Greeneville* crew began high-speed maneuvers to demonstrate the capability of the submarine to the visitors, 33 people, including crew and civilians, were in the control room and the sonar room. This illustration shows the approximate location of the civilians when the submarine executed the last evolution, an emergency surfacing maneuver.

About 1314, the CO entered the control room and advised the OOD-2 to prepare the submarine to perform the angles and dangles maneuvers. He did not discuss the contacts with the OOD-2 when he returned to the control room. He said that, based on his prior experience overseeing the main propulsion assistant while he operated as an OOD, he was confident that the officer had maintained situational awareness, that is, knew where the submarine was in respect to the contacts. At the Navy's court of inquiry, senior officers and enlisted personnel stated that, as an OOD, the main propulsion assistant had a reputation for being methodical, meticulous, and "not easily pushed." They also indicated that he typically took longer than more experienced OODs to accomplish tasks.

The CO said that the OOD-2 acknowledged his instructions. He further stated,

I didn't focus on [the OOD-2's] actions. I can't tell you if he did not exit the conn and enter the sonar room, which would have been customary for him to do prior to the conduct of those evolutions. I . . . was looking elsewhere. I was walking around the control room to enhance my situational awareness, my understanding of the contact pictures, looking over . . . to see what we had on time/bearing displays, to see what the Fire Control Technician of the Watch . . . was doing, and looking and engaging the Quartermaster as to our current ship's position to help me understand what our situational awareness was because I had lost it while [I was] in the dining room and . . . stateroom.

The CO testified that he looked at the ops-summary display at the fire control station, which shows the position of all contacts with respect to the position of the submarine. However, he said he did not notice which time history the FTOW had selected for the display, and if a short time history had been selected, the display would not have shown that the OOD-2 had ordered only two course changes (the baffle clear at 1240 and the course change to north at 1245). The CO also stated that he did not look at the plot maintained by the navigation watchstanders. He said if he had done so, he would have realized that the OOD-2 had driven the boat only in a northerly direction and had not driven in easterly or westerly directions that might have provided an accurate contact picture.

Witnesses stated that the CO chatted with the civilians, advising them of the best locations in the control room to observe the maneuvers. Three of the civilians stood on the periscope platform. The FTOW stated that about six or eight visitors stood around the fire control station, blocking his access to the contact evaluation plot (CEP), a large paper graph that was mounted on the bulkhead forward of the periscope stand. The FTOW was required to annotate the CEP with the submarine's heading, the sonar contacts' bearings, and other pertinent observations to provide the OOD with a display of the submarine's position in relation to the known vessel contacts.[19]

Some of the civilians stood in front of the forwardmost two fire control system displays, which the OOD-2 said he typically used to monitor the contact situation. The OOD-2 later told Safety Board investigators, "I didn't have free access all the way over there. I got close enough where I could look at the contact picture and . . . the fire control screens." (See figure 6.) The CO said that when he went to the control room and reviewed the fire control system consoles, the visitors blocked his view of the CEP.

Several crewmembers stated that equipment preparations needed to support higher speed maneuvers delayed the start of the evolutions. According to the OOD-2, the CO "seemed frustrated that he couldn't start the maneuvers right away."

[19] The *Greeneville* was among the last Navy submarines to be equipped with an automated CEP and did not have one at the time of the accident. All Navy submarines now have automated CEPs that display data for both the submarine and its contacts. Navy officials who examined the *Greeneville* CEP after the accident described the entries made by the FTOW as "very sparse," stating, "There were essentially no contact entries for the hour leading into the collision."

"Angles and Dangles" Begin. At 1315, the CO ordered the *Greeneville*'s speed increased to 14 knots. The OOD-2 stated that for the angles maneuvers—steep angled depth changes, frequently at high speeds—a CO typically gives an OOD the boundaries of where to operate, such as "stay between these two depths" and "change course using this high an angle," and then allows the OOD to choose the course of action. Both the OOD-2 and the CO stated that, in this instance, the CO stood immediately behind the OOD-2 and ordered the specific course, speeds, and depths that he desired, and the OOD-2 merely repeated the orders to the diving officer and the helmsman.

The OOD-2 said that the CO directed him to order angles up to 30° and depth changes from 650 feet to 150 feet at speeds varying between 10 and 15 knots. The FTOW testified that the "captain was driving the whole evolution," and the "OOD[-2] was a mouthpiece." While the ship was going through the evolutions, the CO gave the civilian visitors a running commentary on the maneuvers.

According to the FTOW's testimony, during the angles and dangles, he was able to track contacts S-12 and S-13 (the *Ehime Maru*) but not "100 percent . . . the whole time." According to system data, the solution variables for S-13 were not changed for 23 minutes, between 1314 and 1337, while the submarine executed first the angle evolutions and then the high-speed turns.

The FTOW said that because the civilian visitors blocked his access to the CEP and because "you really couldn't do anything" during the high-speed maneuvers, he stopped maintaining the CEP. He told Safety Board investigators that he did not advise anyone that he had stopped annotating the CEP and, because no one mentioned the plot, he thought that no one noticed that he was not maintaining it.[20] He later told Safety Board investigators that he had been the FTOW on numerous visitor cruises on the *Greeneville* and other submarines in the past and had never maintained the CEP while civilians were in the control room.

About the time of the angles and dangles, a sonar technician who had served on the first watch returned to the sonar room to get his jacket. He testified that several civilian guests were in the sonar room, in addition to the sonar supervisor, the broadband stack operator, and the workload share stack operator. The off-duty sonar technician was a 12-year Navy veteran who had joined the *Greeneville* crew in 2001. He said that he noticed that the sonar supervisor and the sonar technicians were trying to talk to each other and the guests at the same time.

The sonar supervisor asked that the off-watch sonar technician stand by the under-instruction operator on the workload share stack because having "another set of eyes . . . can't hurt." The sonar supervisor later testified that he asked the off-watch sonar technician to stay because the under-instruction operator had not completed the sonar qualification requirements, not because the sonar operator at the broadband monitor was

[20] A submarine force operations order (OPORD) stipulates that the FTOW cannot cease maintaining the CEP without permission from the conn.

overloaded. He did not brief the off-watch sonar technician about the contacts that sonar held at that time.

The off-watch sonar technician said that the sonar operator at the broadband stack appeared not to be distracted by questions from the guests. The unqualified workload share stack operator, however, was trying to answer the visitors' questions. At one point, the workload share stack operator started to turn away from the display to talk with the guests, but the off-watch technician told him not to do so. The technician said that he then asked the visitors to leave the sonar room.

The off-watch sonar technician said that during the angles and dangles, he became concerned about an "interference pattern" on the sonar monitor that appeared to suggest that one of the contacts was closing. He expressed his concern to the sonar supervisor, who told him to check to see what data the FTOW had on the contact. Shortly thereafter, the off-watch sonar technician went into the control room and asked the FTOW about "S-10," stating that it appeared to be a close contact. The FTOW said that he made some adjustments on the fire control system to try to put the contact on a closing course, but "it wouldn't fit," and he advised the off-watch sonar technician that the contact was on an opening course.[21]

Begin High-Speed Turns. About 1325, the CO directed the OOD-2 to order a course change to 140°, and the *Greeneville* began executing high-speed turns. According to the sonar supervisor, moving back and forth numerous times "just makes your display [look like] spaghetti. You've got lines in all directions from how the ship's driving. Contacts are kind of fading in and out" as they enter and leave the baffle area. Both S-12 and S-13 faded as they entered the port baffles.

To obtain accurate TMA results, the conning officer is responsible for ordering the submarine on a constant course, speed, and depth for a period of observation known as a "leg," during which the relative motion of the contacts can be observed. According to Navy officials, a minimum of two legs is necessary to determine the solution for a contact, and maneuvers that afford looking at the target from different aspects "very quickly" reduce the possible solutions to "a very limited number."

Shortly before 1331, after the high-speed maneuvers were completed, the CO ordered a speed reduction, a decrease in depth, and a course change to 340°. The CO's Standing Order 6 stipulated that the submarine would be held on course a minimum of 3 minutes to allow sonar and fire control to obtain an accurate contact picture.[22] According to recorded data, the submarine remained on the 340° course for 91 seconds. Of this time,

[21] System data show that the *Greeneville* lost the track on S-10 more than 30 minutes earlier, about 1245. The Navy court of inquiry concluded that the off-watch sonar technician confused his contact numbers and that based on his observation that the close contact later faded in the baffles during the course turn to 120°, was referring to S-12.

[22] Submarine COs develop standing orders for vessel operating requirements that are based on instructions issued by the Navy's submarine forces commanders. The fleet instructions state that commanding officers "retain the flexibility to adapt/edit their standing orders as long as they meet the core requirements." The 3-minute course standard for TMA is set out in Naval Warfare Publication 3-21.51.1.

the total period that the *Greeneville* maintained a steady depth and speed was about 20 seconds.

Order to Periscope Depth. At 1331, the CO ordered the ship to slow to 10 knots and directed the OOD-2 to make preparations to proceed to periscope depth and to be at that depth within 5 minutes.[23] Figure 8 shows key events, beginning at 1331, on the *Greeneville* relative to the tracks of the submarine and the *Ehime Maru*.

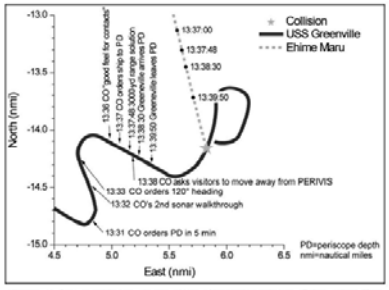

Figure 8. Plot showing the tracks of the *Greeneville* and the *Ehime Maru*. The *Greeneville* track is annotated with key events on the submarine beginning at 1331. The *Ehime Maru* track is annotated with the position of the fishing vessel at some corresponding times.

The CO's Standing Order 6 lists 16 actions and instrument checks, some involving as many as six steps, that the OOD is required to perform when preparing to go to periscope depth. One required action is for the OOD to conduct a periscope-depth briefing with key personnel to verify the contact picture. The CO later told Safety Board investigators,

[23] The CO's own standing orders stipulated that no less than 8 minutes would be allotted for the preparations necessary to go to periscope depth.

> He [the OOD-2] was so . . . slow, I knew that he couldn't get to PD [periscope depth] in 5 minutes. It was my objective to give him a goal to work towards . . . I doubt that any of my experienced officers of the deck could have gotten to periscope depth in 5 minutes.

The OOD-2 stated that when he heard the CO order him to prepare to go to periscope depth in 5 minutes, he considered the directive "unusual" and was concerned about the time limit. He said that when preparing to go to periscope depth, the OOD drives the ship "a certain way . . . so he can get a clear contact picture." To ensure the accuracy of the information, he asks sonar to report all contacts. If the reliability of the data is questionable, the sonar supervisor can advise a good course for TMA, whereupon the OOD orders more maneuvers.

The OOD-2 said that he then reports to the CO explaining the contact picture, including the types of contacts and their bearings, speed, and drift. The CO evaluates the OOD's report and, if convinced that the information is accurate, grants the OOD permission to proceed to periscope depth.

The OOD-2 said that he did not have a periscope-depth briefing because of "the time constraints and the challenge to go to periscope depth rapidly." He further stated,

> I would never think of not doing a periscope brief but, at the time, I had the commanding officer present, the executive officer present, other department heads present, as well as the chief of staff, SUBPAC.

Regarding the actions of the CO, the OOD-2 stated,

> Here's a man with much more experience than I have, much more schooling than I have, [who] can much more rapidly assess and evaluate information . . . I did not believe that he was putting the ship in an unsafe position, and [thought that] . . . the contact picture allowed for safe periscope depth.

Regarding his orders to quickly complete the steps necessary to bring the vessel to periscope depth in less time than indicated in his standing orders, the CO later testified, "I chose to not follow specific things out of my standing orders because I deemed at that time them not to be necessary."

Signal-to-Noise Ratio Increase. Meanwhile, in the sonar room, the broadband stack operator noted that while the submarine was in the middle of the high-speed maneuvers, the SNR for S-13 was "relatively high." Figure 9 shows the SNR data for S-13 (the *Ehime Maru*) that were captured by the *Greeneville*'s sonar system computers on the day of the collision, as plotted by Safety Board engineers.

At this time, the off-watch sonar technician who had been assisting the technicians at the stacks was in the control room, talking with the FTOW. The broadband operator said that he reported the SNR increase on S-13 to the sonar supervisor,

whereupon the sonar supervisor "went to the curtain in control."[24] The sonar technician said that he did not know whether the sonar supervisor spoke to anyone about the SNR increase. When asked about the broadband operator's report, the sonar supervisor said that he did not recall being told about the SNR increase.

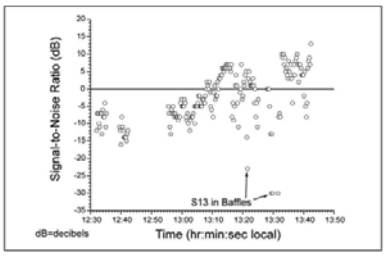

Figure 9. An increase in the SNR for a contact can be an indication that the target is getting closer. In this plot, each circle represents an S-13 signal captured by the *Greeneville*'s sonar system. As indicated in the plot, the SNR for the *Ehime Maru* increased over time except for when the fishing vessel was briefly in the baffle area. Note: The plot developed by Safety Board engineers is not representative of the display on the sonar monitors.

After giving the OOD-2 the order to go to periscope depth, the CO briefly went into his stateroom. From there, he went to the sonar room to assay the sonar picture and "obtain contact awareness." The CO said that as the ship was coming to a keel depth of 150 feet, he overheard the broadband operator tell the sonar supervisor that they had regained "previously held contacts." Recorder data indicate that while the CO was in sonar, the operators regained two contacts, S-12 at 1332:03 and S-13 (the *Ehime Maru*) at 1332:48. According to the sonar supervisor, he did not recall discussing any contacts with the CO while he was in the sonar room.

In the meantime, the XO told the OOD-2 that he would help him determine a course for proceeding to periscope depth by going into the sonar room to get the contacts.

[24] The aft door of the sonar room had a curtain to block the light from the control room.

The XO later stated that he did so because the AVSDU was not operating. The XO went forward in the corridor and entered the sonar room through its forward door.

As the XO entered the sonar area, the CO was exiting the aft sonar door to go into the control room. About that time, the off-duty sonar technician reentered the sonar room after his conversation with the FTOW. He discussed his concerns with the XO, stating that he did not think he was wrong about the closing contact. The XO checked the fire control screens in the control room, returned to sonar, and asked the off-duty sonar technician how fast the *Greeneville* was operating. The off-duty sonar technician said that he then realized the submarine itself had caused the interference pattern because of the speed it was traveling. He further stated that his suspicions were confirmed when the submarine slowed and the interference pattern went away.

When the CO reentered the control room, he looked at the first monitor, the line-of-sight display, at the fire control station. The CO later told the Safety Board that, at this time (1333), he did not think the contact picture had changed, meaning sonar was holding two contacts. He stated, "I was confident that those contacts remained close along the Oahu coast, operating in that vicinity." He said, "I didn't pick up on the fact . . . that we had driven on north-south legs," meaning the *Greeneville* had not executed turns that would have provided changes in bearing rates.

Upon returning to the conn, the CO ordered a course change to 120° for the *Greeneville* to clear baffles. Concurrently, he announced to the visitors that the purpose of a baffle clear was to allow sonar to check for hidden contacts and prevent a collision at periscope depth. The OOD-2 stated,

> I was a little surprised when . . . the captain directed me to change course. I felt that he . . . was kind of driving the ship at that point . . . He had been kind of driving the ship before then, during the angles and dangles, when he gave me the courses and depths and speeds he wanted to drive.

During the course change, sonar gained a new contact, S-14. The fire control system displayed the automatic first solution for S-14 at 1334:03. The FTOW subsequently determined only one tracking solution for S-14, which he entered into the fire control system at 1334:48.

When the XO entered the sonar room, he positioned himself behind the sonar technicians, looking at the sonar display monitors. The sonar supervisor said that he assumed that the XO had come into sonar because the AVSDU was not working. He further stated that he did not discuss the contact picture with the XO. The XO later told Safety Board investigators that, while in sonar, he observed three contacts. He then stood in the sonar room's aft doorway while the submarine went to periscope depth. He did not give the OOD-2 or the CO any information about the sonar contacts or recommend any course for surfacing.

Shortly after sonar gained contact S-14, the signal for contact S-12 faded in the port baffles. About 1335, the baffle clear was completed, and the submarine was steady

on course 120°. Reconstructed system data show that, about this time, the *Ehime Maru* (contact S-13), operating at a constant heading of 166° and a speed of 11 knots, was 3,282 yards from the submarine. When the submarine steadied course, the FTOW was able to resume determining solutions for the contacts. The FTOW said that he had "very low" confidence in his track for S-14 because it was based on "a single leg" that had lasted about a minute.

At 1335:39, the OOD-2 announced on the public address system for the crew to report all contacts. The CO testified that he recalled the sonar supervisor reporting two contacts, S-13 and S-14. The FTOW stated that he recalled sonar reporting three contacts: S-12, S-13, and S-14. About that time, the CO announced that he had "a good feel for the [sonar] contacts." According to the FTOW, the fact that the sonar announcement included S-14 and the CO's statement reassured him that the CO was aware of S-14.

About 1337, about 1 1/2 minutes after the *Greeneville* was on a steady 120° leg, the CO ordered the OOD-2 to proceed to a depth of 60 feet (periscope depth). Reconstructed system data show that, at 1337:00, the *Ehime Maru* was at a range of 2,724 yards, or 1.34 nautical miles. (See figure 8.) The FTOW stated that he quickly updated the solutions for the contacts that he was tracking, including S-12, S-13, and S-14. He described his updating as "rushed" and said that he was still updating his contacts as the submarine ascended to periscope depth. He said that he continued to give priority to analyzing S-14 because of the lack of data on the contact.

The sonar supervisor stated that when the submarine ascended to periscope depth, the monitor displays were changed to a different scale to enable the crew to watch for transient noise that was "different" or "unexpected," such as a quick change in a contact's bearing rate. The FTOW stated that while the submarine proceeded to periscope depth, he monitored the three contacts on the fire control system's time-bearing presentation because a fast bearing rate would indicate a close contact. System data indicate that, at 1337:48, less than a minute before the submarine arrived at periscope depth, the FTOW updated the solution for S-13 (the *Ehime Maru*), changing it from an opening to a closing solution and adjusting the range from 16,000 to 4,000 yards. The dots on the display immediately began to align, an indication that the solution was comparatively accurate. Reconstructed system data show that, at 1337:48, the *Ehime Maru* was at a range of 2,510 yards, or 1.24 nautical miles. (See figure 8.) The FTOW said that he failed to notice the range of S-13 "because he was trying to get everything done" before the submarine reached periscope depth. Standing Order 6 stipulated that the FTOW would notify the conn of all contacts 4,000 yards or less from the *Greeneville*, however, in this case, the FTOW did not report the status of S-13 to either the OOD-2 or the CO.

As the *Greeneville* ascended to periscope depth, the CO asked that some of the civilian visitors move because they were blocking the view of a video monitor that displayed the image seen through the periscope.[25] At 1338:30, the ship arrived at a depth

[25] The periscope video system, or PERIVIS, displayed the periscope image on several monitors throughout the vessel, including a screen near the fire control station. The PERIVIS also had a record feature that could be activated by the person using the periscope.

of 60 feet. Reconstructed system data show that, at this time, the *Ehime Maru* was at a range of 2,315 yards, or 1.14 nautical miles. (See figure 8.)

Periscope Search. The OOD-2 said that when the submarine reached periscope depth, he started to conduct a normal search using the No. 2 periscope.[26] When the periscope broke the water's surface, he executed the rapid low-power searches. He said that he completed his three rapid revolutions and announced, "No close contacts." He said that he was about to begin his next search when the CO took the periscope and began his own search routine. The FTOW said that, in accordance with the usual procedures, no one said anything in the control room or made any reports until they heard the OOD-2 say, "No close contacts," after the initial phase of his periscope search.

The CO later testified that he searched primarily in the sector where he believed the known contacts were located. He stated that he

> swept the scope in low power, went to high power, looked, then panned to the right, saw the island [Oahu] . . . I can only see the mountain peak, I can't see the mountains . . . because of this white haze . . . Then I could see an airplane taking off. . . . I panned to the right where I thought I would see [S-13] the *Ehime Maru*. I looked over at the remote repeater [own-ship's data] and I saw the numbers and [thought] that looks right. That's where the guy is. Didn't see him. Then went to low power and then turned to the right. I think . . . the *Ehime Maru* was perhaps further to the right, and as I swept in low power . . . missed her. And that's the only explanation that I can think of as to why I missed the vessel. It was perhaps too far to the right out of my field of view when I was doing my high power search thinking that the degree of optics that I was covering would encompass and overlap that area of uncertainty.

The FTOW said that when the periscope projected above the water, he shifted his attention to the PERIVIS monitor. He said that the CO did a "quick 360-degree look" in the general direction of the contacts, 40° and 340°, and then stopped on 18°. The CO next ordered the ship "to come up for a high look," a depth of 58 feet, to increase the periscope height of eye. The FTOW described the CO's search as "uncued" because he did not ask fire control to verify the bearings to the contacts, "which is my job." The FTOW stated, however, that he "was confident that the captain knew what he was doing during the periscope search."

The FTOW said that he thought that he had a good range for S-13, and that it was between 5,000 to 6,000 yards while the submarine was at periscope depth. He was under the impression that, of the three contacts, S-14 was the closest. He said, however, that he

[26] Naval Warfare Publication 3-13.10 requires making at least three 360° low-power sweeps, about 8 seconds per sweep, to search for close contacts as soon as the periscope breaks the surface. If safe operation is indicated, "No close contacts" is announced. The *Greeneville*'s former CO, in describing a standard periscope search, testified that after the initial three sweeps, the OOD would do an air search in which he panned from the maximum elevation view down to the horizon, then would announce, "No airborne contacts." He would then do a 360° low-power search, which took about 45 seconds, followed by a 90° high-power sector search on the point where he terminated the 360° low-power search.

was not surprised when he didn't see a vessel on the PERIVIS because "fire control [is] only as good as the maneuvers you make," and he had "range errors . . . more than 50 percent of the time." He said that he estimated that he might be off by about 2,000 yards for S-13. He said that his confidence in the solutions for the contacts "immediately rose up" when they did not see any vessel through the periscope.

ESM Search. In addition to the periscope search, the movement to periscope depth enabled the technicians at the electronic support measures (ESM) system, located in a separate room behind the control room, to conduct a defensive search to identify and classify sources of detected electromagnetic radiation. Two crewmembers, a qualified and an under-instruction ESM operator, were present in the ESM room when the submarine went to periscope depth. The ESM station had one set of headphones. When the ESM antenna broke the water's surface, at 1338, the under-instruction ESM operator listened on the headset for aural indications of nearby vessels, and the qualified operator listened to the open microphone for the OOD-2's report.[27]

The qualified ESM operator said that he asked the under-instruction ESM operator what he thought, and that he responded there were multiple contacts but none was close. He said that before the OOD-2 announced, "No close contacts," he took the headset and listened to the aural indications. The categories of signal strength range from 1 to 5, with 5 being the strongest. The qualified ESM said that he heard none with a signal strength of 4 or 5, which would indicate a close-in contact. Upon hearing the OOD-2's announcement, the qualified ESM operator told the unqualified operator to announce, "No close contacts."

Emergency Evolutions. The CO testified that because there were "no visual contacts" and because both sonar and ESM had reported no threat contacts, "I called [an] emergency deep as a training evolution. . . . It was obvious that it took the control room party by surprise, which, for a training evolution of this type, I intended to do."

By the time that the CO ordered the emergency deep dive, about 1340, the FTOW had entered three solutions for S-13 using a range value of 3,000 yards. The fire control system display continued to indicate that his solution was accurate. Reconstructed system data show that, at 1339:50, the *Ehime Maru* was at a range of 2,236 yards, or 1.10 nautical miles. (See figure 8.) The FTOW later stated that, just before the emergency main ballast tank (EMBT) blow, he adjusted the range in his solution to 9,000 yards based on the fact that the CO had just completed a visual search and not reported seeing any close contacts.[28]

As the submarine descended, the CO asked the quartermaster the course to P/H, and the quartermaster responded that it was 340°. The CO then ordered a course change to 340° to head the submarine toward its return point.

[27] Naval Warfare Publication 3-55.42 stipulates that the ESM's defensive aural search should be conducted in the same time as the OOD's initial search for close contacts, that is, within 24 seconds.

[28] Data indicate that the FTOW changed the range to 9,000 yards after the collision.

The guests stated that the CO then asked them whether they would like to participate in the vessel's upcoming evolution, which was the EMBT blow. During this maneuver, high-pressure air is used to force water out of ballast tanks as rapidly as possible to bring the submarine back to the surface in the shortest possible time. For the maneuver, the CO personally assigned one guest to sit in the helmsman's chair and operate the helm controls and stationed another guest to operate the valve levers that released the high-pressure air into the main ballast tanks. A third guest was stationed at the diving alarm. Experienced crewmembers supervised the visitors at the controls throughout the evolution, and the CO narrated what was happening for the visitors' information during the submarine's ascent. The FTOW said that during the EMBT blow, the civilians who were standing were "holding on to stuff—whatever they could grab onto to help stay up."

The sounding of the alarm was the signal to begin the emergency blow maneuver. At this time, witnesses reported, the guest at the high-pressure air controls operated the levers under close supervision of Navy personnel, and the submarine started to rise at a sharp angle. The guests recalled that, shortly afterward, there was a loud noise, and the submarine shuddered. The guests quoted the CO as saying, "What the hell was that?" After the submarine slowed and the periscope could be raised, the CO looked into the periscope and announced that the submarine had struck another ship. (See figure 10.)

Figure 10. The collision between the *Greeneville* and the *Ehime Maru* occurred about 9 miles south of Oahu, Hawaii, at position 21°05.6' N, 157°49.1' W. Dotted line indicates the edge of the submarine's assigned submerged operating area.

The FTOW said that immediately after the collision, he went into sonar and talked with the sonar crew to determine whether they still had the contacts they had been tracking. He said that he was surprised to learn later that the vessel struck by the *Greeneville* was indeed one of the contacts they had been tracking. He said that he assumed that the ship they hit had been "dead in the water," meaning its machinery was turned off.

Sinking of the Ehime Maru

Personnel on board the *Ehime Maru* reportedly heard two loud noises and felt the fishing vessel shudder. The bridge crew all stated that they did not see anything before the collision. According to the *Ehime Maru*'s master, "There was no ship at all nearby." He stated that "the range of vision was good" and that "there was no outline of a ship nearby on the radar," a Tokimec model BR-3440MA-X59. He said that he then felt two impacts and the stern of the ship lifted up.

After the impact on the fishing vessel's port aft quarter, the *Ehime Maru* bridge personnel looked aft and saw the submarine as it broached the surface of the water. The *Ehime Maru*'s lookout said that after observing the submarine, he turned forward and saw diesel fuel squirting from the fuel tank vent on the forward port side of the fishing deck. The *Ehime Maru*'s master said that he realized immediately that his vessel was in trouble. Within 5 seconds of the collision, the *Ehime Maru* lost all power, including the backup systems on the emergency generator circuit. He said that he tried to call for assistance using the VHF-FM marine band radios, but they would not work. The master directed the chief radio operator to activate the emergency position indicating radio beacon (EPIRB), a portable 406-MHz model with a hydrostatic release, that was installed immediately outside the pilothouse, on the port bridge wing. (See figure 11.) According to witnesses, the chief radio officer was wearing an automatically inflating lifejacket and was near the bridge when the vessel began to sink. No one recalled seeing him reentering the pilothouse, leaving the ship, or swimming in the water.

Meanwhile, on the third deck (the lowest deck of the fishing vessel), the chief engineer, the first engineer, and the first oiler were in the engine control room when the oiler said he heard a loud scrape and then felt an impact. He said that the space immediately went black, and water and fuel flooded the area with such force that he was "violently" knocked about. He said that he could not recall how he was able to escape the engineroom but thought that water gushing in had carried him through the engineroom and up through a deck opening to the second deck. From there, he climbed up the ladder and out of the vessel. He said that he never saw the chief engineer and the first engineer after the impact.

At the same time, on the second deck, the nine students who survived the accident had just finished lunch and were either in the crew mess or in cabins that were immediately forward of the mess. The four students in the crew mess went directly aft. The students in their cabins said that when they looked out into the passageway, they saw

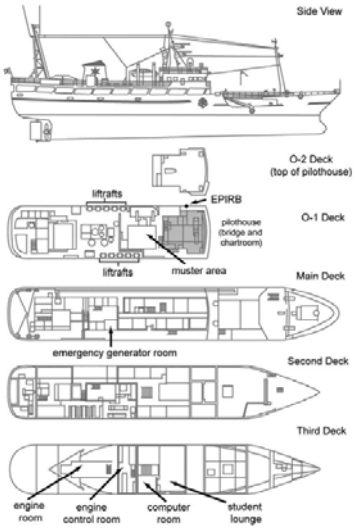

Figure 11. Side view of the *Ehime Maru* and plan views of the decks.

water and oil gushing up the stairwell from the deck below. The *Ehime Maru* was equipped in the berthing areas and at the watch stations with automatically inflating lifejackets that met the standards of the International Convention for the Safety of Life at Sea, 1974 (SOLAS), as amended. Most of the surviving students were able to retrieve the lifejackets from their cabins; other students said that they did not think to do so. They said that as they went aft in the passageway, they had to wade through an ankle-deep mixture of oil and water. Most of the students first went to the fantail area, or stern overhang, of the main deck. From there, they went to the mustering station aft of the pilothouse.

All survivors reported gathering in the muster area behind the pilothouse. Several witnesses stated that after it settled in the water, the *Ehime Maru* then sank by the stern at a 30° to 45° angle within 5 minutes of the collision. As the ship began to submerge, some people went into the water or were washed off by the waves coming over the stern. The remaining personnel attempted to climb a ladder to get onto the top of the pilothouse. Two students were washed off the ladder into the sea. Other students and crewmembers reached the top of the pilothouse only to be washed off by waves as the vessel sank. The oiler stated that he injured his shoulder when a wave washed him against a searchlight mounted on top of the pilothouse. Survivors carried underwater with the sinking ship either swam up to the surface or their lifejackets automatically inflated and carried them up. Witnesses from the submarine and the *Ehime Maru* reported that, after the fishing vessel sank, the water was covered with a heavy sheen of oil.

The *Ehime Maru* also carried 10 SOLAS-approved liferafts in containers mounted with hydrostatic releases that were designed to activate when the vessel sank to water depths ranging from 5 to 25 feet. The raft containers would then float to the surface and be automatically inflated by "tag lines" attached to the vessel with breakaway links.

According to personnel who escaped the vessel and made it to the water's surface, the liferafts functioned as designed, and survivors were able to climb into them. The second engineer wound up in a raft by himself. He said that the submarine approached him and its crewmen called out to him. He yelled back, but the English/Japanese language barrier prevented him from understanding them.

Emergency Response

After determining that the *Greeneville* had struck a surface vessel, the submarine CO reported the collision to the Navy's COMSUBPAC operations center at 1348. COMSUBPAC center personnel, in turn, notified Navy command personnel and Coast Guard Group–Honolulu by both landline telephone and VHF-FM marine radio. The Coast Guard and then the Navy began sending search-and-rescue assets to the scene. For a chronology of response events between the collision and the recovery of the *Ehime Maru*'s survivors, see appendix C. An in-depth discussion of response activities follows.

Response Efforts by the *Greeneville*. After the submarine struck the *Ehime Maru*, the *Greeneville*'s engineering officer took over as OOD during the response effort and initiated rescue and assistance measures as required by Operations Procedure (OP)

61-19.[29] In addition, a medical treatment station, manned by a hospital corps technician, was established in the officer's wardroom.

The OOD stated that he and a petty officer manned the bridge, which was located inside the submarine's sail, within 6 minutes of surfacing. The fishing vessel had already sunk, so the OOD conned the submarine toward the *Ehime Maru*'s rafts and debris while the petty officer looked for survivors in the water. Control room personnel searched the area using both periscopes. Because of rough seas, the main deck hatches could not be opened; the only outside access was through the sail access trunk.[30]

The OOD and the lookout were joined on the bridge by the CO and two divers. In preparation for retrieving the fishing boat's occupants, the divers, who were trained in basic first aid, rigged a Jacob's ladder, which is a rope ladder with wooden or plastic steps, down the side of the sail.

As the submarine neared two rafts of survivors, the OOD called out to and tried to communicate with the people; he said that he was not successful, however, because of the English/Japanese language barrier. He saw one person who appeared to be injured lying in a raft. He said that because he had been advised that Coast Guard resources were soon due on scene, he elected not to put a diver in the water. He further stated, however, that if the submarine crew had seen any people from the *Ehime Maru* in the water before the Coast Guard boats arrived, he would have had a diver go to their aid.

Actions by COMSUBPAC. When COMSUBPAC received initial notification at 1348, its command personnel assumed search-and-rescue mission coordination for the Navy response and identified immediately available Navy resources to dispatch to the accident site. At 1355, COMSUBPAC watchstanders notified Coast Guard Group–Honolulu of the accident. Navy officials said that, during the initial phase of the response, they dispatched Navy vessels and aircraft independent of the Coast Guard response. However, COMSUBPAC maintained an open telephone line to Coast Guard Group–Honolulu to keep apprised of developments.

According to Navy officials, at 1504, based on information received about the scope of the accident, COMSUBPAC transferred search-and-rescue mission control of the dispatched Navy assets to the Coast Guard. (See next section.) The COMSUBPAC operations center continued to independently identify and launch Navy air and sea resources, notifying the Coast Guard when the response assets were en route.

[29] The Naval Sea Systems Command has published the rescue and assistance procedures contained in the Los Angeles Class ship systems operations manual as a separate classified reference document, OP 61-19. The OP includes the actions to take and which crewmember is responsible for taking them should certain types of emergencies occur. The reference document also lists the precautions and the safety limitations that the rescue and the assistance details must follow when responding to an emergency.

[30] Videotape taken by the Coast Guard response helicopter shows large waves washing across the *Greeneville*'s main deck.

Coast Guard Response. According to the duty officer at Coast Guard Group–Honolulu communications center, when he received notification at 1355 of a collision in the area south of Diamond Head, he assumed responsibility as search-and-rescue mission coordinator for the case, in accordance with the agency's standard operating procedures. He first ordered a Coast Guard HH-65A helicopter (No. 6570) on routine air patrol to divert to the accident site and then ordered Coast Guard Station–Honolulu to send rescue boats to the scene.

Coast Guard Station–Honolulu initially dispatched two vessels: a 21-foot rigid hull inflatable boat (RHIB) with 3 crewmembers and a 41-foot patrol boat with 7 crewmembers, including an emergency medical technician. The Group duty officer said that when he realized that the Coast Guard's standby cutter, the *Kittiwake*, was several hours away from the accident site, he ordered the recall of the Coast Guard cutter *Assateague*, which was at home base in a maintenance status. The *Assateague*, staffed with off-duty personnel from several cutters, got under way within 1 hour of notification.

Helicopter No. 6570, with two pilots, a hoist operator, and a rescue swimmer on board, arrived at the site at 1427, about 45 minutes after the collision, and assumed command of the on-scene response. The helicopter pilot centered on the rafts and debris and, at 1446, began a sector search for people in the water.

In the meantime, the RHIB and the patrol boat arrived at the scene at 1431 and 1444, respectively. The RHIB went from raft to raft, counting people, identifying who had sustained injuries, and searching for someone from the *Ehime Maru* who spoke English. According to the coxswain on the RHIB, the master of the *Ehime Maru* was located in a raft and taken on board. The fishing boat master and the RHIB crew continued to count survivors in the rafts and determined that 9 people were missing. The Coast Guard responders radioed a report about the missing personnel to Group Honolulu.

When the Coast Guard patrol boat arrived on scene at 1444, the helicopter lowered its rescue swimmer by hoist to the boat, which then maneuvered next to three liferafts that were tied together. The rescue swimmer moved from raft to raft, assessing the condition of the survivors and treating those who were injured. He immobilized the arm and shoulder of the injured oiler and, using bottled water from the raft survival kits, flushed the eyes of those who had eye irritations from the diesel fuel.

The RHIB retrieved and ferried survivors from the other rafts to the patrol boat, where the EMT-trained crewmember medically assessed their conditions. The on-scene responders then distributed the 26 survivors between the two Coast Guard boats and returned to Coast Guard Station–Honolulu, arriving there about 1615.

Joint Rescue Coordination Center Response. At 1505, the Joint Rescue Coordination Center[31] assumed the responsibility of search-and-rescue mission

[31] The national search-and-rescue plan designates the Coast Guard as the U.S. aeronautical and maritime search-and-rescue coordinator with overall responsibility for the Honolulu region. The agency's

coordinator from Coast Guard Group–Honolulu because of the building magnitude of the case. During the early response, the Joint Rescue Coordination Center did not control or coordinate the influx of Navy resources into the search; however, once the Joint Rescue Coordination Center was advised of the responding Navy resources, center personnel directed the Navy assets to specific search areas and assigned the search patterns.

About the time that the patrol boat and the RHIB were retrieving the *Ehime Maru* survivors, the Coast Guard diverted a C-130 aircraft to the site to relieve helicopter No. 6570 of the on-scene command for the surface and air assets. The Coast Guard cutter *Assateague* subsequently assumed on-scene command of the search and rescue.

Honolulu Emergency Medical Services. The Honolulu emergency medical services dispatcher, working through the communications networks of local hospitals, determined the space availability at the medical facilities and routed ambulances from the Coast Guard Station. The four most seriously injured individuals were taken to Straub Hospital, which treated three of the injured for nausea and eye and throat irritations stemming from diesel fuel ingestion or hypothermia. The oiler was diagnosed with a fractured right clavicle and hospitalized for 5 days.

Because of a lack of available space at Straub Hospital, the remaining five *Ehime Maru* occupants requiring medical attention were taken to Kaiser Permanente Medical Center, where they were treated for eye irritations caused by the diesel fuel and released.

None of the missing personnel was seen after the *Ehime Maru* sank, either by the survivors, *Greeneville* crewmen, or other rescue personnel.

Extended Search Activities

Coast Guard or Navy units were on scene continuously for 22 days, searching for missing personnel. Two civilian vessels of Japanese registry also participated in the search. Initial attempts to locate the fishing vessel were unsuccessful because of bad weather and because of an erroneous report of the accident site. The Safety Board assisted the Navy in determining the location of the *Ehime Maru* by acquiring radar data from the U.S. Air Force 84th Radar Evaluation Squadron and the Federal Aviation Administration (FAA) and filtering the data to plot a track of the *Ehime Maru* that correlated with the time, heading, and speed reported by the master of the fishing vessel. (See discussion in "Safety Board Performance Study" section.) The Navy then moved the search area to the end of the radar track.

On February 16, Navy sonar detected a vessel and, at 1129, Navy personnel were able to identify the fishing vessel by maneuvering a remotely operated vehicle, the *Scorpio II*, so that its video cameras displayed the *Ehime Maru*'s stern plate. The vessel was sitting almost upright in 2,003 feet of water about 1,000 yards from the reported

Joint Rescue Coordination Center, based in Honolulu, is operated by the Fourteenth Coast Guard District and is jointly staffed by Coast Guard and Air Force personnel.

collision site but almost directly under the end of the radar track. For the next week, two underwater remotely operated vehicles, the *Scorpio II* and the *Deep Drone*, searched the *Ehime Maru*'s exterior and the sea bottom surrounding it for the nine missing persons, with no success. The search effort was suspended on March 2.

Salvage Operations

To retrieve the bodies of the *Ehime Maru*'s missing occupants, the Navy contracted to build a specially designed lifting and spreader assembly, which could be operated from a diving support vessel with heavy lift capability. On October 12, 2001, the *Rockwater 2* lifted the *Ehime Maru* about 100 feet above the ocean floor and transported the suspended fishing vessel to a shallow-water recovery site about 115 feet deep near the Honolulu International Airport's reef runway. A team of Navy and Japanese divers then recovered the victims' bodies, personal effects, and mementos, and videotaped the vessel damage. After the search was complete, the *Ehime Maru* was transferred 16.5 miles out to sea, where it was lowered into its final resting place.

At the request of the families of the victims, their bodies were not autopsied and were returned to Japan. The body of the ninth accident victim could not be located, and he is presumed dead.

Damage Surveys

Ehime Maru. An underwater survey of the vessel's bottom revealed a cut in the hull that began on the starboard side inboard of the bottom near the deckhouse front. (See figure 12.) The cut, between 2 to 3 feet wide, ended on the port side shell in the vessel's engineroom, where it extended vertically from the vessel's bottom to 11.5 feet (3.5 meters) above it (the design waterline mark).

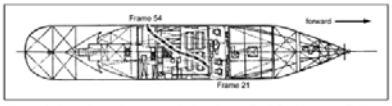

Figure 12. According to diver reports, the line of cut in the *Ehime Maru* extended from frame 21 to frame 54 through both the bottom and the innerbottom of the doublebottom vessel. The cut, therefore, resulted in breaches in the student lounge, the access stairwell to the student lounge, the engine control room, and the engineroom.

The cut proceeded from forward to aft of the vessel and breached the vessel's innerbottom[32] in the student mess, the stairwell, and the engine control room. The cut then proceeded through the bulkhead between the control room and the engineroom, leaving a vertical cutout in the bulkhead that was the approximate shape and size of the *Greeneville*'s upper rudder. The vertical outline of the rudder was also visible on the port side shell of the *Ehime Maru*'s engineroom, through which the submarine's upper rudder had exited the fishing vessel's hull. The line of cut had breached several doublebottom (DB) tanks; going forward to aft these tanks included No. 2 fuel oil DB tank (starboard), No. 3 fuel oil DB tanks (starboard and center), and No. 4 fuel oil DB tank (port) in the engineroom. Both the outer and innerbottoms had been cut through. Damage to the control room and to the interior of the student mess and vertical stairtower on the port side of the computer room was visible during the survey. The open vertical stairtower allowed water to immediately flood upward to the upper deck levels of the vessel.

Greeneville. Safety Board investigators conducted a damage survey of the *Greeneville* in drydock at Pearl Harbor Naval Shipyard. Investigators found that the sail of the submarine showed no damage. Immediately below the sail, the acoustic hull surface treatment (tiles) on the portside hull had been sheared off in an elliptical pattern about 24 feet long.

The upper rudder, located at the submarine's stern, showed the greatest impact damage. The damage began at the 31-foot draft mark and extended all the way to the top of the upper rudder on both its port and starboard sides. Surface tiles had been sheared off exposing bare metal over most of the rudder surface, and there were several indentations on the rudder's leading edge. One of the larger indentations had punctured the metal skin on the port side. The anchor light had been sheared off the top of the rudder. Other scrapes and missing paint seen on the hull were correlated by the Navy to previously existing wear and tear on the ship. The propeller area had not been damaged.

Safety Board Performance Study

As noted earlier, the Safety Board assisted the Navy in locating the sunken fishing vessel by obtaining Air Force and FAA radar data and extracting the *Ehime Maru*'s trackline. Safety Board engineers also used the radar data as well as own-ship, sonar, and fire control data retrieved from the *Greeneville*'s sonar data logger (SLOGGER) to conduct a performance study of the *Greeneville*, the *Ehime Maru*, and other surface vessels around the time of the accident. Excerpts from that study are summarized below. Note that the study and all the plots exclude the classified speeds and depths exceeded by the submarine during the visitor cruise.

The complete performance study is part of the public docket maintained on this accident by the Safety Board at its headquarters in Washington, D.C. For additional

[32] The *Ehime Maru* had a doublebottom design, meaning the bottom of the ship had a compartment used for fuel, ballast, and so forth that was topped by a shell plating. This plating is referred to as the innerbottom.

details on the development of the tracks of the *Ehime Maru* and the *Greeneville* and the plots comparing all nonclassified recorded data and fire control solutions, see the public docket.

Ehime Maru *Track*

To determine the position of the *Ehime Maru*, Safety Board engineers sorted the radar data obtained from the Air Force and the FAA and removed any radar return that was not south of the radar site or that originated from aircraft with transponders. The remaining radar returns were plotted as a function of time to identify radar tracks, that is, consecutive radar returns. The radar data having the characteristics of surface ships (slow speed, no aircraft transponder return) were obtained from Honolulu airport, which uses Airport Surveillance Radar Model 9 (ASR-9). The airport radar antenna has an elevation of 68.1 feet and a magnetic variation of 10.5° E. The Safety Board converted azimuth and range data to east and north position from this antenna using the Tracks software program. One track visible in one of the plots ended at 2343 Universal Coordinated Time (UTC), or 1343 local time. This was later established as the time of the collision, initially from witness interviews and then from system data.

The radar tracks in the plots were separated and compared with sonar data. One track ended at the wreckage site and at the 2343 UTC collision time (as seen in own-ship data). This radar track was considered to be the *Ehime Maru*. The track showed the *Ehime Maru* moving at 11 knots on a heading of 166°.

Greeneville *Track*

The digital audio tape (DAT) information captured from the sonar interface unit consisted of TARed (a UNIX compression standard) ASCII data, which Safety Board engineers uncompressed on a UNIX workstation, transferred to a computer, and recorded onto a CD-ROM. The files consisted of data for the *Greeneville*'s motion (own-ship data), towed-array parameters,[33] and sonar and fire control data parameters. The recorded own-ship parameters consisted of time, heading, pitch, roll, depth, and speed. Angular data were obtained from the inertial navigation system. All own-ship data were recorded once a second; however, some data points were missing and the recording time sequence was occasionally offset briefly. Because the speed and direction of a submarine cannot change much in 1 second, Safety Board engineers manually repaired the bad data points. From the own-ship data, the Safety Board developed the plots shown below. Figure 13 shows the *Greeneville*'s keel depth and heading for the period between the ascent to periscope depth and the collision.[34]

[33] Because the towed array was not deployed, the towed-array parameters were columns of zeros.

[34] The keel depth data held 90.84 feet for 7 seconds immediately before the collision. The Safety Board worked with the Navy to determine the cause of this false reading, but nothing conclusive was determined.

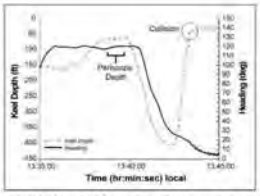

Figure 13. Keel depth and heading of the *Greeneville* between the ascent to periscope depth and the collision.

Integrated Tracks

The integrated plot of the *Greeneville* track and the *Ehime Maru* track developed by Safety Board engineers appears in figure 8. The Safety Board also developed a three-dimensional representation of the *Greeneville* and *Ehime Maru* tracks, beginning with the submarine's ascent to periscope depth and ending at the wreckage site. (See figure 14.)

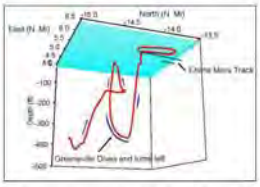

Figure 14. Three-dimensional representation of the *Greeneville* and *Ehime Maru* tracks, showing the submarine's ascent to periscope depth, the diving left turn, the collision with the *Ehime Maru*, and the return to the wreckage site. Note that depth is not to scale with east and north position.

Postaccident Actions by the Navy

Navy Court of Inquiry

General Findings. On February 9, 2001, the COMSUBPAC ordered an official inquiry into the collision between the *Greeneville* and the *Ehime Maru*. In its final report, the court of inquiry issued 26 recommendations, which, among other actions, included disciplinary measures against shore-based officials and six *Greeneville* crewmembers and reviews of various programs and procedures for adequacy and compliance.

Disciplinary Actions. Based on the findings and recommendations of the court of inquiry, the *Greeneville*'s CO was taken to Admiral's Mast,[35] where he was found guilty of committing two violations of the Uniform Code of Military Justice: dereliction of duty and negligent hazarding of a vessel. He was "detached for cause" from his position as CO, which was documented in his Navy officer record. He submitted a request to retire, which was approved, and he retired effective October 1, 2001.

The OOD-2 was taken to Admiral's Mast, where he was counseled for failing to execute his duties to ensure the safe navigation of the ship and to properly supervise watch personnel in the control room. The FTOW was taken to Captain's Mast for failing to report a closing sonar contact (the *Ehime Maru*) in accordance with standing orders.

The XO and the chief of the boat were both admonished for lack of oversight and execution of the enlisted watchbill.[36] The sonar supervisor was admonished for his poor watchstanding and backup of the contact management team and his failure to ensure that only qualified personnel stood watch in sonar.

The FTOW and the sonar supervisor were required to requalify before standing another underway watch in their supervisory positions.

Program Reviews. The court of inquiry report stated that various programs and operating procedures should be reviewed for adequacy and compliance. Table 2 summarizes the tasks the court recommended that COMSUBPAC or the Navy should accomplish.

[35] Mast is an administrative proceeding where a senior officer can impose nonjudicial punishment for disciplinary offenses that do not merit courts-martial.

[36] Some individuals listed on the watchbill were not on the vessel and, no one was initially assigned to the fathometer watch, which is a station that must be manned when operating within 10 miles of land. The sonar supervisors switched personnel to accommodate for the oversight. The Navy found that, on the day of the accident, 9 of the 13 watch stations during the second underway were not stood by the individuals assigned to them. Several crewmen switched watches with a fellow crewmember without advising their supervisors or obtaining their permission to change duty assignments.

Table 2. Court of inquiry recommendations and actions taken

Task	Actions Taken
Ensure compliance with operating standards that permit only fully qualified sonar technicians to stand sonar watch.	In June 2001, COMSUBPAC issued guidance by classified message to subordinate echelons and all Pacific Fleet submarines reemphasizing sonar watchstanding requirements. The message directed that under-instruction sonar watchstanders be supervised by a qualified watchstander assigned on the watchbill to that station, not by the sonar supervisor. Compliance with sonar watchstanding qualifications and sonar watchstanding proficiency is now routinely inspected during the interdeployment training cycle.
Review the adequacy of the COMSUBPAC Operational Risk Management (ORM) program.	COMSUBPAC conducted an internal audit of COMSUBPAC to ensure compliance with Navy ORM instructions in OPNAVINST (Chief of Naval Operations instruction) 3500.39. In June 2000, Commander of Naval Forces instruction 5040.12 was revised to require that ORM be used in interdeployment training cycle inspections and assessments.
Review the ability and means of submarine squadron commanders and their staffs to provide meaningful oversight and objective feedback to their submarine commanding officers and crews during the interdeployment training cycle.	On August 28, 2002, a classified COMSUBPAC instruction was revised to include comprehensive interdeployment training cycle management. A squadron commander now conducts a 2-week assessment early in each submarine's interdeployment training cycle to identify, among other things, the strengths and weaknesses in basic submarine operations. The assessment results are used to focus training during the interdeployment training cycle to prepare the submarine crew for its next overseas deployment.
Coordinate a review of submarine open-ocean search-and-rescue capabilities and requirements with the lead type commander and make appropriate recommendations to the Chief of Naval Operations.	Naval Warfare Publication 3-50.1 (rev. A) promulgates Navy doctrine for search-and-rescue operations. The publication is subject to periodic review and update. It has been updated by change on three occasions since February 9, 2001. No changes were suggested by the Navy's court of inquiry report and none of the intervening changes relate specifically to submarine open ocean search-and-rescue operations.
Review the maritime traffic density of the Hawaiian operating area with the Coast Guard and other appropriate government agencies every 3 years.	A COMSUBPAC memorandum, dated April 23, 2001, now requires a maritime traffic density review for submarine force training agendas.
Provide information and training to the force concerning the *Greeneville* collision.	On April 23, 2001, COMSUBPAC sent a "lessons learned" message to all COMSUBPAC COs. The message was followed by a classified joint message from the commanders of the U.S. Atlantic and Pacific submarine forces, summarizing the main findings and opinions of the investigation as approved by the Commander of the Pacific Fleet. All submarine wardrooms and senior enlisted quarters have conducted training on the factors that contributed to the collision. A case study of the collision between the *Greeneville* and the *Ehime Maru* has become part of the curriculum at each level of tactical training for submarine officers. In addition, each wardroom is required to train on this case study annually.

The court of inquiry report concluded that the Navy's distinguished visitor program should be fully supported. However, the court recommended that the COMSUBPAC coordinate with the Chief of Naval Operations and the Naval Chief of Information to conduct a complete review of Navy public affairs policy and guidance on

the embarkation of civilian visitors, and to issue new guidance that was internally consistent, clear, and more specific. The report also recommended that the approval authority for distinguished visitor embarkations be delegated to commanders at the type level, which is the second echelon to the fleet command. In the case of the Pacific submarine fleet, the type commander was the COMSUBPAC.

Regarding the conduct of distinguished visitor cruises, the court of inquiry recommended that COMSUBPAC identify which evolutions were appropriate for demonstration and reemphasize to the force that classified operational depths and speed limits are inappropriate for civilian cruises. The court of inquiry further recommended that COMSUBPAC establish a formal means for disseminating feedback or sharing information regarding distinguished visitor experiences across the command.

Revision of Instructions Addressing Visitor Cruises

At the Navy's court of inquiry, the COMSUBPAC testified that the Navy had both Secretary of the Navy instructions (SECNAVINST) and OPNAVINST addressing distinguished visitor cruises, a "tiny" but "extremely important" part of the Navy's civilian outreach program.[37] COMSUBPAC had issued operations orders and instructions pertaining to visitors on ships; however, the COMSUBPAC guidance documents basically iterated the policies put forth in the instructions issued by the Chief of Naval Operations and the Secretary of the Navy.

Neither of the publications cited by service officials contained requirements for ensuring the safety of civilians embarked on Navy vessels.[38] The instructions also did not address the procedural issues of whether and when civilians should be permitted in the control room or the sonar room and, if so, how many visitors should be allowed. The guidance did not indicate whether or when interaction between visitors and watchstanders should be allowed or define the role of the CO during a visitor cruise. In addition, the instructions did not specify which maneuvers should be conducted for the benefit of the distinguished visitors or, more importantly, prohibit any deviation from standing orders that might jeopardize the submarine, its crew and passengers, or vessels in the vicinity of the submarine's operating area.

Following the *Greeneville* collision with the *Ehime Maru*, chapter 4 of SECNAVINST 5720.44A was revised in May 2002, transferring the oversight for

[37] In calendar year 2000, the entire Pacific fleet sponsored 176 guest embarkations, providing cruises for about 8,000 civilians. Of the 176 cruises, COMSUBPAC had 51 embarkations for 1,354 guests. Of the COMSUBPAC guest embarkations, 12 cruises carrying a total of 213 civilian visitors originated from Pearl Harbor. The COMSUBPAC stated that this total was less than the total embarkations in 1999, when SUBPAC hosted 227 civilians on 18 visitor cruises that originated from Pearl Harbor.

[38] In addition, none of the 26 Department of Defense, Navy, and Marine Corps documents cited as references for SECNAVINST 5720.44A addressed safety measures for civilian visitors on Navy ships, nor did they include procedural differences in submarine operations that were unique to visitor cruises.

distinguished visitor embarkations to commanders at fleet level, which for Naval forces in the accident area was the Commander, U.S. Pacific Fleet.

In August 2003, COMSUBPAC issued COMSUBPACINST 5720.1, which contained procedures for handling public visits on Pacific Fleet submarines that supplemented SECNAVINST 5720.44A, Commander of Naval Submarine Forces (COMNAVSUBFOR) OPORD 2000 (appendix 4), and SECNAVINST 5510.34. COMSUBPACINST 5720.1 procedures stipulate rules and requirements for each distinguished visitor embarkation on a Pacific Fleet submarine. The section pertaining to civilian distinguished visitor cruises states, "Civilian embarkations pose a degree of risk that must be properly managed."

The revised COMSUBPAC instructions address omissions in previous guidance documents, for example, interaction between watchstanders and visitors, the conduct or prohibition of certain maneuvers, and whether and how many civilian visitors should be permitted in the control room during certain evolutions. The instructions specify, in part, the following:

- Visitors should receive an introductory safety brief that advises them of what to expect in an emergency and how to don protective gear.
- Embarkations are to remain unclassified. The ship will not exceed unclassified depth or speed.
- The CO "will ensure guests do not inhibit the safe operation of the ship."
- One crewman will be assigned as a dedicated tour escort for every four to eight guests, and the watchbill will include those crewmembers serving as tour escorts. The escorts will have no other assigned responsibilities during the underway.
- The crewmembers assigned as tour escorts should be selected "to ensure first the safety of the visitors, then satisfy their information needs."

The procedural changes now require that requests for cruises be submitted in writing through the submarine's chain of command either to the COMSUBPAC or, if the hosting submarine is deployed, to the fleet commander. The requests must include a schedule of key events, and the force commander must review the planned maneuvers in terms of appropriateness for the assigned operating area, taking into consideration the shipping and fishing vessel density, water depth, and any other hazards to safe conduct. The August 2003 instructions prohibit allowing civilian visitors to operate any equipment; however, as part of the event schedule submission, the CO may propose allowing civilians to operate certain equipment during specific events while under the direct supervision of a qualified watchstander. Such a proposal must be approved by the force commander.

COMSUBPACINST 5720.1 permits up to 24 visitors, including noncrew escorts, on a civilian embarkation. The criterion for selecting an escort who accompanies the

guest groups is "to ensure first the safety of visitors, then satisfy their information needs." The CO or his agent must review the itinerary developed for the visitors for areas of "conflict," that is, where overcrowding might occur.

In addition to the required procedures, COMSUBPACINST 5720.1 contains recommended actions for ensuring the safety of ship operations. For example, the initial briefing to visitors should be conducted in the mess facility during the outbound transit so that the piloting party can function without distraction. To ensure that the control room is not overcrowded during evolutions, the plan of the day should include two surface and dive evolutions, the implication being that a guest group of 24 should be divided and fewer visitors allowed in the control room at one time. To ensure that the crew is not distracted while making preparations to go to periscope depth, the visitors should be taken to the mess facilities, where they can watch a movie or a monitor linked to the PERIVIS.

Oversight Changes

During his interview with Safety Board investigators, the COMSUBPAC Deputy Chief of Staff for tactics and training described several "subtle" changes affecting squadron oversight of the *Greeneville* that were not recognized as having a combined detrimental impact until the Navy investigated the collision.

The COMSUBPAC deputy pointed out that a ship typically comes back from one deployment and deploys again within about 15 months. Because the *Greeneville* was a test platform for the Advanced SEAL Delivery System, it was not in the squadron's regular deployment rotation. As a result, Squadron 1 conducted fewer observations of the *Greeneville* and made fewer formal reports on its operations than in the past.

Beginning in 1999, the Navy changed the required oversight practices for the squadrons. Instead of stipulating that, at a minimum, the squadron conduct a tactical examination on a ship every 12 to 15 months, the Navy keyed the tactical examination to the vessel's interdeployment training cycle. As a result of the *Greeneville*'s extended interdeployment training cycle, the squadron had not conducted a formal tactical examination since 1998, when the submarine was fitted with the Advanced SEAL Delivery System.

About the same time that the Navy changed the squadron oversight standards, it also reorganized the squadron commands, which resulted in staff reductions. According to the COMSUBPAC deputy, during the transition period from the old to the new squadron command organization, the oversight infrastructure of the commands was "probably not well focused."

The COMSUBPAC deputy said that while the squadrons were being reorganized and oversight practices were being changed, the newly appointed commander to Squadron 1 "was struggling with another boat that had a . . . series of problems" but that was on a deployment cycle and had to be ready to go to sea by the end of December 2000. He said that when the Squadron 1 commander and other senior personnel visited

the *Greeneville*, the "superficial" indicators of readiness all looked good. The boat was clean. The crewmembers were "positive . . . happy with their leadership . . . and proud of their organization." Moreover, crew retention was good.

The COMSUBPAC deputy said, "If we had taken the time . . . and studied in detail . . . the fundamental practices on the ship, I think that we would have seen the harbingers of problems." He stated that since the *Greeneville* collision, the Navy has changed the method for evaluating submarines. All boats are evaluated regularly, regardless of their deployment cycles. The focus is on forcewide performance in a particular area. The evaluation is a multistep process:

- *Basic submarine assessment.* Evaluate the submarine crewmembers to determine their fundamental understanding of their jobs and responsibilities.
- *Corrective actions.* Identify and monitor actions to correct problem areas; evaluate the weak areas the next time the vessel goes to sea.
- *Second formal review.* Two inspections are conducted 6 to 8 or 9 months after the basic assessment to check the ship's readiness to deploy. The first inspection is conducted by the squadron commander, the second by the COMSUBPAC staff and training office. The inspection team "baselines them against everyone else." The squadron commander then directs the CO to correct identified problems.

At a minimum, a ship must receive a passing grade on three major tactical events in a 15-month period. In addition, the submarine must pass two engineering inspections. Squadron personnel are on board and watching and tracking the ship's procedures during all events. Every ship is graded to an absolute common standard by the use of grade sheets. The squadron deputy told Safety Board investigators, "I think there's a great deal of sensitivity . . . to readiness, almost to the point that we've overcorrected in a way." He said that, in late 2001 and early 2002, two or three ships had not left on time because of unreadiness detected in the inspection process.

Operational Risk Management Program Changes

The Navy's court of inquiry found that, "Had *Greeneville*'s CO and crew been practicing the basic tenants of ORM, the collision may have been avoided." The court of inquiry recommended that COMSUBPAC review the adequacy of its current ORM program.[39] The stated purpose of the Navy's ORM program is to minimize risks to acceptable levels, proportional to mission accomplishment. The Navy's ORM is a closed-

[39] Finding 66 and recommendation 8 of the court of inquiry report (Record of Proceedings, *Court of Inquiry into the Circumstances Surrounding the Collision Between USS Greeneville [SSN 772] and Japanese MV Ehime Maru That Occurred Off the Coast of Oahu, Hawaii, on 9 February 2001*, U.S. Navy, April 13, 2001).

loop process that supervisory personnel use to identify and control hazards. The process involves the following five steps:

- Identify hazards;
- Assess hazards;
- Make risk decisions;
- Implement controls; and
- Supervise.

The level of an ORM analysis is time-critical, deliberate, or in-depth, depending on the situation. The depth and formality with which a supervisor conducts an ORM is guided by the following four principles:

- Accept risk when the benefit is greater than risk;
- Accept no unnecessary risk;
- Anticipate and manage risks by planning; and
- Make risk decisions based on the right level of analysis.[40]

As noted in table 2, following the adjournment of the court of inquiry, COMSUBPAC conducted an internal audit of its operations to ensure compliance with Navy ORM instructions. In addition, Navy instructions were subsequently revised in 2003 to include assessments of the use of ORM in training inspections.

Course and Training Changes

After the *Greeneville*'s collision with the *Ehime Maru*, the Navy revised its basic submarine course and all officer training, including the content of courses, entrance tests, and final examinations, the conduct of training, and the appropriateness of assignments for skill development. The courses now integrate the lessons learned from the *Greeneville* accident.

[40] OPNAVINST 3500.39A.

Analysis

In its review of the events in this accident, the Safety Board determined that qualified and experienced members of the combat management team (the conning officer, the FTOW, and the sonar supervisor) as well as senior officers who happened to be in the control room failed to follow procedures designed to ensure safety in operations. The teamwork problems demonstrated on the day of the collision were due in part to the CO's overly directive style, particularly with the OOD-2. However, the failure of key watchstanders to effectively perform their duties and communicate vital information to the conning officer contributed to the CO's committing the following critical errors:

- Failed to perform adequate contact analysis;
- Rushed the procedures for moving to periscope depth; and
- Ordered an emergency surfacing maneuver in the direction of a contact.

Contributing to the operating errors of the combat systems team was their failure to adequately manage the civilian visitors so that they did not distract the watchstanders from the efficient execution of their duties. A detailed discussion of the operating errors follows. The analysis also considers the design of the *Ehime Maru* and the survivability of the fishing vessel in the accident.

Failure to Perform Adequate Contact Analysis

To accurately determine the range, course, and speed of a vessel contact, the combat systems team needed to interact to ensure that a sufficient change in the contact's bearing rate was generated. For the visitor cruise, the *Greeneville* had no established track. The submarine sailed almost straight south and then, with the exception of one baffle clear, almost straight north while operating at a keel depth of 600 to 650 feet during much of the submerged underway. According to Navy officials in charge of tactical training, a crew can do "solution development without maneuvering the ship by using a variety of ranging techniques," and "operating at 600 feet reduces or minimizes the need for a precise solution" until the submarine is preparing to go to periscope depth. Navy officials who testified at the court of inquiry or who were interviewed by Safety Board investigators indicated that TMA could have been performed either immediately before or immediately after the *Greeneville* conducted the evolutions, so long as it was conducted before the submarine proceeded to periscope depth. Thus, it was not inappropriate for the combat systems team to wait until later in the underway, shortly before preparing to surface, to concentrate on contact (or target) motion analysis.

Problems arose, however, when both the sonar supervisor and the FTOW made assumptions about the contacts, including S-13 (the *Ehime Maru*), which later resulted in their providing incomplete and erroneous information to the CO. When sonar acquired S-13, the sonar supervisor correctly assessed that the vessel was distant and that it was

not showing much of a bearing rate. However, when the bearing rate remained small for more than 40 minutes, he incorrectly assumed that the vessel was island traffic, on a distant course, and probably moving away from the submarine. He thus failed to properly assess the potential risk, anticipate a dangerous scenario, and advise the CO that the *Greeneville*, steering 000°, and the S-13 (the *Ehime Maru*), bearing 358°, were on closing courses.

The FTOW indicated that sonar did not designate any of the contacts as merchant ships. He stated that "just being in Hawaiian waters," he assumed that the contacts were typical of the "traffic around here . . . probably trawlers, fishing vessels [and] pleasure crafts." He too thought that S-13 was distant and did not enter a tracking solution for the contact for 16 minutes (between 1240 and 1256). As further evidence that he did not consider S-13 a threat contact, at 1257:45, he changed his tracking solution for S-13 to place it on an opening course despite having no analysis showing that the contact was actually opening.

Problems were exacerbated when the CO did not use all his resources to correctly assess the current operating situation when preparing for the conduct of the evolutions in the control room. He elected to confer with his trusted senior petty officers, first visiting sonar, where he was briefed by the supervisor, and then stopping at the fire control station, where he talked with the FTOW. The CO later stated that he had assumed that the OOD-2 had conducted TMA and had been confident that the young conning officer knew where the submarine was in relation to the contacts; yet, he never discussed the contact picture with him. The OOD-2 was aware that the combat systems team "did not have a great contact picture of where [S-12 and S-13] were" before the evolutions began. For his part, the OOD-2 assumed that some evolutions would be cancelled because the submarine was due back at P/H at 1400 and that a senior officer would brief him about the changes. The CO and the OOD-2, as the first- and second-level officers in the operational chain of command, should have conferred, not only about the contacts, but also about the safe completion of the voyage.

The CO testified that he went into sonar to assay the contact picture for himself. He recalled that in his discussion with the sonar supervisor, he was told that sonar held two contacts, a merchant vessel to the northwest [S-12] and a surface craft to the northeast [S-13, the *Ehime Maru*]. The sonar supervisor told the CO that the contacts "were distant, [and] up by land," and more than 10,000 yards away. Thus, the CO assumed that the contacts posed no danger. The sonar supervisor did not advise the CO that S-13 had not shown any bearing drift for 40 minutes, that the course of the *Greeneville* had been on a straight south/north track throughout most of the cruise, or that the submarine and S-13 were on closing courses. Had the sonar supervisor communicated this information, the CO might have recognized the potential risk and not taken the operational shortcuts that he later did.

The CO then entered the control room, where he said he reviewed the fire control monitors and discussed the contact status with the FTOW. The fire control technician made almost the same comments about the contacts being typical Hawaiian marine traffic as the sonar supervisor had done, which reinforced the CO's opinion about the position

and course of the contacts. When he approached the conn, the CO then observed and recalled that the AVSIDU was not working. If he had reviewed the CEP, which the FTOW maintained until an hour before the evolutions, the CO might have realized that the movements of the contacts and the submarine had been inadequate for good contact analysis. Instead, he chatted with the visitors, advising them where to stand for the best view of the evolutions, which prompted several civilians to position themselves in front of the CEP, blocking the CO's view of it and the FTOW's access to it.

Rushed Procedures for Movement to Periscope Depth

At the onset of the angles and dangles, rather than properly oversee the OOD-2 by having him direct vessel movements that the CO could verify as being correct, the CO essentially took over the conn without acknowledging that he was doing so. He ordered specific depths and turns, which the OOD-2 repeated to the diving officer and the helmsman. As the captain of the submarine, the CO had the authority to assume the conn.[41] However, by removing himself as backup to and overseer of the OOD-2, the CO eliminated a measure of safety redundancy that the Navy had developed for operations.

During the high-speed turns, which lasted between 5 and 6 minutes, the sonar display was scrambled, making it difficult if not impossible for the sonar crew and the FTOW to determine the accuracy of the contact picture. About 1331, as the submarine was beginning to slow on course 340°, the CO abandoned the checks and balances stipulated in his standing orders and started taking procedural shortcuts that adversely affected the ability of his crew to improve their contact awareness, thereby jeopardizing the safety of the cruise. He ordered the OOD-2 to complete preparations to go to periscope depth within 5 minutes, which the CO said even a veteran OOD would probably have difficulty accomplishing.

The OOD-2 attempted to complete the preparations for going to periscope depth, an involved process requiring him to conduct several tests, instrument checks, and, perhaps most important, a briefing with key watchstanders to share information about the sonar contacts. Through this vital communications step with the sonar supervisor, the FTOW, the radioman, the ESM, and the navigation supervisor, the OOD-2 could have ascertained whether the conn needed to order additional movements to improve the TMA.

Meanwhile, the CO had left the conn to go into sonar, where he watched the monitors as two contacts, S-12 (bearing 316.6°) and S-13 (bearing 016.3°), reappeared, respectively, at 1332:03 and 1332:48. He later stated that the displays led him to believe that the contact picture had not changed, whereupon he returned to the control room.

[41] Navy operating procedures stipulate that the CO announce when he is assuming the conn and that the conning officer (in this case, the OOD-2) announce, "The captain has the conn" to the watchstanders, and "Sir, I have relinquished the conn" to the CO.

The *Greeneville* was arriving at 150 feet, the depth at which the OOD-2 reasonably would order TMA maneuvers, when the CO returned to the conn about 1333 and immediately ordered a course change to 120° to clear the baffles. The CO's actions of interrupting the OOD-2 and resuming the conn resulted in the OOD-2 not holding the required briefing to discuss the contact environment. Again, the CO did not discuss the contact situation with the OOD-2. For his part, the OOD-2 did not speak up and advise the CO that he had not been able to determine whether additional TMA was warranted. Thus, the two officers again failed to communicate necessary information to one another that would have pointed out the need for improved contact awareness.

The CO's order to change course meant that he allowed the *Greeneville* to remain on the 340° leg less than 2 minutes (1331:36 to 1333:03), rather than the 3 minutes stipulated for TMA in Navy operating procedures. More important, the submarine was on a steady speed and course (to 340°) less than 25 seconds before the course change to 120° began. The baffle clear turn was complete about 1335; however, the CO then ordered the submarine to proceed to periscope depth at 1336:45. Consequently, he did not hold course long enough on either the 340° leg or the 120° leg to permit good TMA, a serious error.

The Safety Board constructed a hypothetical *Greeneville* track, extending the 340° and the 120° legs to 3 minutes each to allow for proper TMA. Figure 15 superimposes the hypothetical track over the actual *Greeneville* track. As shown in the chart, the too-rapid course changes on the actual track resulted in no bearing rate change, which is necessary for accurate identification of the contact's course.

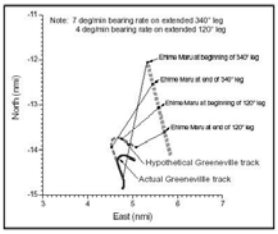

Figure 15. Comparison of *Ehime Maru* bearings with *Greeneville's* actual track and with hypothetical track calculated for 3-minute legs.

The hypothetical track using 3-minute legs produced bearing rate changes that would have readily revealed the course of S-13 to both the sonar crew and the FTOW. The *Greeneville*'s bearing to the *Ehime Maru* on the hypothetical 3-minute legs would have been as follows:

Beginning of 340° leg.....012.1°
End of 340° leg.....033.0°
Beginning of 120° leg.....050.1°
End of 120° leg.....061.8°

The Safety Board determined that the rate of bearing change would have been about 7° per minute on the 340° leg and 4° per minute on the 120° leg if the legs had lasted the required 3 minutes. Thus, the total S-13 bearing change that the *Greeneville* crew could have obtained if the submarine had stayed on each of the TMA legs for 3 minutes is about 50°, as opposed to a bearing change of about 10° for the actual leg. Such a large bearing change and accompanying rate of bearing change would have alerted the sonar crew and the FTOW to the close proximity of S-13 (the *Ehime Maru*). Moreover, the large bearing changes would have provided sufficient input for the FTOW to develop a high-confidence solution for S-13 that would have placed it nearby and closing.

The CO's conning of the vessel compromised the ability of the combat systems crew to verify the contact picture in other ways. The turn that he ordered for the baffle clear put one of the known sonar contacts, S-12, bearing 316.5°, into the baffle area, the result being that sonar lost the track on the vessel. During the turn, sonar gained S-14, bearing 358°, a potential threat contact to the submarine. The FTOW, having no solution on S-14 and believing that S-13, now 4,200 yards away, was not operating near the *Greeneville*, began to concentrate on S-14 to the exclusion of S-13. However, he could not resume determining solutions for the contacts until the submarine steadied on course 120°, about 1334.

Meanwhile, the CO did not respond appropriately to the sonar supervisor's announcements about the loss of S-12 and the gain of S-14 by determining either their status or whether he needed to conduct additional TMA. Possibly he did not hear the sonar announcements, or perhaps he did not recognize the implication of sonar announcing the loss of one contact and the gain of a new contact. The CO later told Safety Board investigators that he probably would not have made the errors that he did if the AVSIDU had been working and he had been able to refer to the sonar repeater.

The CO's comments reflect an operating failure that existed on board the *Greeneville* during this underway. Neither the CO nor the senior members of the combat systems team (OOD-2, sonar supervisor, and FTOW) demonstrated effective ORM when compensating for the inoperable sonar repeater in the control room and for the presence of the civilian visitors near key watchstations. ORM is a decision-making tool used by the Navy and other organizations to increase operational effectiveness by identifying potentially hazardous conditions and adopting procedures aimed at reducing or mitigating the potential for loss. On the *Greeneville*, the standard procedure for compensating for

the loss of the AVSDU was for the conning officer to periodically visit the sonar room to assay the contact picture. However, the OOD-2 never visited the sonar room after conducting his prewatch checks.

The CO chose to compensate for the loss of the AVSDU by twice visiting the sonar room and reviewing the monitors there. Upon returning to the conn after his second visit to sonar, he ordered a course change to 120° to clear buffles about 1333. About the same time that the CO was explaining the purpose of a baffle clear to the civilian visitors, sonar gained S-14 at 1333:03. Thus, the CO may not have recognized that the sonar supervisor was announcing a new contact. The CO's possible error as well as the failures discussed later in this analysis, under "Management of Civilian Visitors," demonstrates that the combat systems team should have assessed the combined impact on operations of the inoperable AVSDU and the presence of civilians near the fire control station and the conn and devised better methods for communicating contact information to the conning officer.

Before the *Greeneville* rose to periscope depth, the CO announced to everyone in the control room that he had a "good feel" for the contacts, which had the effect of discouraging backup from his crew. The inexperienced OOD-2 acquiesced to the more experienced commanding officer, and the seasoned FTOW discounted a solution at his fire control station indicating that S-13 (the *Ehime Maru*) was 4,000 yards away or less. The XO, who had told the OOD-2 that he would go to sonar and relay contact information to him, said nothing to either the OOD-2 or the CO to ensure that the conn had accurate information about the contacts.

The CO continued to rush, pushing his crew and truncating recommended steps for safe operation. While at periscope depth, he interrupted the OOD-2's periscope sweep and took over operating the periscope, executing only a few brief sweeps in the general area where he believed the sonar contacts to be. The CO then ordered the submarine to a shallower depth (from 60 feet to 58 feet), raising the periscope 2 feet for a greater height of eye. On this day, the seas were choppy, 3 to 4 feet; the sky was not clear. The CO either failed to recognize the need to compensate more for the choppy seas and the haze or simply did not do so. He did not order the submarine to a shallower depth for a significantly better height of eye and he did not execute a slower, more deliberate sweep to ensure that no vessels were obscured by the haze. Once again, he did not use his crew resources and solicit the feedback or assistance necessary for safety. Normally during the CO's periscope sweep, the FTOW would assist him in putting the periscope on the precise bearings of the sonar contacts, a standard procedure that improves the probability of detection. On this day, the CO did not ask for assistance, and the periscope was not centered on the contacts' bearings.

The crew's behavior immediately preceding the collision suggests that their errors were strongly influenced by the CO's announcement about the contact picture. In effect, the CO's flawed situational awareness regarding the proximity of vessels at the surface reinforced and influenced the watchstanders' own limited situational awareness. The CO was well regarded by his crewmembers, as evidenced by, among other things, the *Greeneville*'s high retention rate, but his popularity may have worked against optimal

crew performance. That is, because of his rank and the respect among the crew that he commanded, his crew appeared to have acted as though they believed that if the CO thought the surface was clear, it was.

The two-way communication necessary for effective bridge resource management[42] was not evident on the *Greeneville*. The COMSUBPAC Deputy Chief of Staff for tactics and training told Safety Board investigators,

> The watchstanders had sort of an inherent trust in their commanding officer; they didn't speak up when they should have. [They believed that] . . . if the captain thinks it's okay to go up, who am I to stand in front of him and tell him it's not right, and they kind of just rolled on the captain's decision to go up.

If crewmembers disagreed with the CO's assessment, none spoke up to provide him essential feedback, particularly in the presence of the visitors. Every *Greeneville* crewmember interviewed later by the Navy or by the Safety Board stated that he never doubted the assessment of the CO. After the collision, neither the sonar supervisor nor the FTOW believed that the submarine had struck a contact that they were tracking.

Emergency Surfacing Maneuver Toward Contacts

After his brief periscope sweep, the CO ordered an emergency deep dive. During the submarine's descent, he ordered a course change to 340°. Recorded data indicate a left turn during the dive, consistent with this command. He then announced an EMBT blow, an evolution that he had told the navigator he was going to cancel but later said that he decided to order on the spot for training purposes. Again, the CO's actions demonstrate that he continued to fail to employ ORM during the conduct of this cruise. Navy trainers told Safety Board investigators that the operating instructions pertaining to EMBT blows are classified. They stressed, however, that before executing such an emergency surfacing maneuver, COs should do "additional risk management" to ensure that the watchstanders have good information and existing conditions have been identified.

In the case of the *Greeneville* CO, he took a series of procedural shortcuts rather than perform ORM before executing the EMBT blow. He did not establish effective measures for monitoring the sonar contacts. He did not ensure that effective TMA had been accomplished. He abandoned or truncated measures designed to promote safety redundancy in operations, including his proper oversight role of the conning officer and his conduct of the second periscope sweep. He did not use his crew resources effectively to ensure that he obtained good feedback about the operating environment.

[42] Bridge resource management, or BRM, is an operational mechanism for ensuring the safe completion of a vessel's voyage. The Coast Guard requires that operators of certain vessels, such as tankers, employ BRM, and the International Maritime Organization recommends that training for seafarer certification include BRM. (See *International Convention of Standards of Training, Certification and Watchkeeping for Seafarers, 1978*, as amended in 1995.)

The CO's actions after ordering the EMBT blow indicate that he added the emergency evolution for the benefit of the civilian visitors. For the evolution, he paid particular attention to ensuring that the civilian visitors were involved in it. He personally assigned one civilian to sit at the helm controls and allowed another to operate the levers at the high-pressure air controls, albeit under the supervision of experienced crewmembers. He then narrated what was happening during the submarine's ascent for the information of the passengers.

The EMBT blow maneuver requires that a vessel's rudder be centered. Recorded data show that as the EMBT blow maneuver began, the vessel's turn rate slowed, consistent with a rudder centering. At the beginning of the EMBT blow, the submarine's heading was 025°. Thus, the CO's conning order was a serious error that resulted in the submarine pointing in the direction not only of S-13, bearing 018°, but also S-14, bearing about 358°.

As the *Greeneville* rose at a high speed, its heading continued to change slowly and was at 018° when the *Greeneville* struck the *Ehime Maru*, slicing open the bottom of the fishing vessel's hull.

Management of Civilian Visitors

In this case, the civilian visitors did not directly cause the accident; however, their presence on the submarine and the manner in which they were accommodated by the crew, especially the CO, had an adverse impact on the safety of operations.

The *Greeneville* cruise on February 9 was conducted contrary to COMSUBPAC instructions, which stipulated that distinguished visitor embarkations "must be scheduled and conducted within the framework of otherwise planned underway operations, and should not be conducted solely to accommodate civilian guests." The *Greeneville* had been scheduled to begin an underway for testing on February 9, and the civilian guests had been scheduled to ride the submarine during the first day of that underway. However, at the suggestion of the *Greeneville* CO, COMSUBPAC had delayed the start date for the test voyage until February 12 and had granted the *Greeneville* CO permission to take the civilian visitors on a 1-day voyage on February 9.

The unintended effect of permitting such a cruise was that the crew did not demonstrate the attention to detail that they reportedly had exhibited during previous underways and training exercises. They either adopted a somewhat informal attitude toward their duties or concentrated on accommodating the visitors to the detriment of their work.

In the findings from the Navy's court of inquiry, officials found fault with the senior crew's preparation of the watchbill for the visitor cruise. The Safety Board considered whether the poorly prepared watchbill and the crew's subsequent switching of watch assignments were factors in the accident and found that in all but one case, key watch stations were manned by qualified crewmembers. Only sonar lacked a required watchstander: an over-instructor to monitor the qualifying technician. Considering that

the *Greeneville* rarely held more than three contacts, the sonar supervisor could have easily monitored the qualifying technician. However, he could not properly oversee the qualifying technician and efficiently perform his own duties while accommodating the civilian visitors. As evidence of this, he forgot to reset the sonar recorder after playing sound tapes for the enjoyment of the visitors. He also either did not observe the visitors distracting his crew or did nothing to prevent it once the demanding evolutions began.

According to an off-duty sonar technician, when he returned to the sonar room about the time of the angles and dangles, several civilian guests were in the sonar room, in addition to the sonar supervisor, the broadband stack operator, and the workload share stack operator. He said that he noticed that the sonar supervisor and the sonar technicians were trying to talk to each other and the guests at the same time. The off-watch sonar technician said that the sonar operator at the broadband stack appeared not to be distracted by questions from the guests. The unqualified workload share stack operator, however, was trying to answer the visitors' questions. At one point, the workload share stack operator started to turn away from the display to talk with the guests, but the off-watch technician indicated to him that he should watch the display. The off-watch sonar technician said that he then asked the visitors to leave the sonar room. While it is commendable that the off-watch sonar technician took action to improve the operating environment for the sonar crew, the sonar supervisor should have recognized the distraction that the visitors might pose to the watchstanders and asked the civilians to leave the sonar room before the evolutions began.

Interaction with the guests created scheduling problems and changed the operational dynamic in the control room. The *Greeneville*'s activities for the visitor cruise, as listed on the plan of the day, remained reasonably on schedule until first the CO and then the XO each hosted a civilian group at lunch for an hour instead of the time allotted. The CO testified at the court of inquiry and later told Safety Board investigators that he realized that the submarine would be late returning to PH because of the delay caused by the long lunches; however, he said that he did not rush the conduct of the evolutions to try and return the visitors on time. He indicated that if he had felt rushed, he would not have continued to sign souvenir photographs in his stateroom, but would have gone into the control room sooner to begin the evolutions. In his 2003 autobiography,[43] however, he indicated that his rushed actions during the evolutions were driven by his knowledge that the civilian visitors needed to be back at Pearl Harbor by a given time for a later appointment.

In the control room, the CO's management of and interaction with the visitors created both physical and communication barriers for his subordinates. After he advised the civilians where to stand for the best vantage point of the upcoming evolutions, six to eight visitors stood on the starboard side of the periscope platform, blocking the FTOW's ready access to the CEP, which the FTOW was required by standing order to annotate to provide the conning officer with a display of the submarine's position relative to the position of known vessel contacts. The FTOW said that he stopped maintaining the CEP

[43] S. Waddle and K. Abraham, *The Right Thing* (Nashville: Integrity Press, 2003).

because of the presence of the visitors. Given that the visitors also blocked the conning officer's view of the CEP, the FTOW's failure to perform this watch task did not affect the outcome of this accident because neither the OOD-2 nor the CO attempted to review the chart.

Some of the civilians stood in front of two fire control system displays that the OOD-2 used to monitor the contact situation. The OOD-2 later told Safety Board investigators, "I didn't have free access all the way over there."

Although the civilians impeded their work, neither the OOD-2 nor the FTOW asked them to move or told the CO that the visitors were adversely affecting operations. The CO was focused on directing the activities for the civilians rather than managing the civilians to ensure that they did not interfere with the watchstanders' execution of their duties. As a result, the FTOW was reluctant to speak up and interrupt him. Thus, the activities for the civilian visitors stymied communication and prevented the conn from receiving necessary feedback from the crew.

As a result of the Navy's court of inquiry, in August 2003, COMSUBPAC issued new procedural requirements (COMSUBPACINST 5720.1) for handling in-port public visits and embarkations on Pacific Fleet submarines. The COMSUBPAC instructions include provisions designed to ensure not only that visitors remain safe but also that crew operations are not compromised during a civilian embarkation. The crewmembers assigned to oversee the civilian visitors while they are on the submarine must be listed as escorts on the watchbill and they cannot be assigned to a workstation. The CO or his agents are to review the itinerary developed for the visitors for areas of "conflict," for example, areas where overcrowding might occur when all or several civilians are present.

Recommended procedures include conducting the initial visitor briefing in the mess facility during the outbound transit so that the piloting party can function without distraction. To ensure that the control room is not overcrowded during evolutions, the instructions recommend that the plan of the day include two surface and dive evolutions, so that a visitor group can be divided and fewer civilians permitted in the control room at one time. To ensure that the crew is not distracted while making preparations to go to periscope depth, the instructions recommend that the visitors be taken to the mess facilities, where they can watch a movie or a monitor linked to the PERIVIS.

In addition to revising procedures directly related to visitor cruises, the Navy made changes in squadron oversight designed to address safety deficiencies that the Safety Board also noted in its investigation. For several reasons, the *Greeneville* was not subject to the type of oversight that should have revealed shortcomings in the crew's adherence to Navy operating procedures. Factors affecting squadron oversight included removal of the *Greeneville* from the regular deployment rotation when it was equipped with an Advanced SEAL Delivery System, realignment of the squadron and the resulting reduction in oversight personnel, and demands on the newly appointed squadron commander who was given the priority to prepare another submarine for deployment.

The development and implementation of effective operating procedures for all phases of operations is a prerequisite for the safe operation of any vessel, military or civilian. Operating procedures in and of themselves, however, are insufficient to ensure safety unless they are accompanied by systematic oversight of their use by crewmembers or workers in regular operations. Effective oversight provides information not only about how individuals use or comply with operating procedures but also about whether the procedures, as written or established, are effective in an actual operating environment.

As a result of the *Greeneville* accident, the Navy changed its method of evaluating submarines, regardless of their deployment cycles. The squadrons now employ a multistep evaluation process that includes, among other reviews and tests, a basic evaluation of the submarine crewmembers to determine their fundamental understanding of their jobs and responsibilities; identification of procedural problem areas or weaknesses and follow-up monitoring by squadron officials; and a second formal review to check a ship's readiness to deploy.

The changes in squadron oversight procedures as well as the new requirements for distinguished visitor cruises demonstrate that the Navy has recognized the detrimental operating conditions that existed on board the *Greeneville* and has taken additional measures to address the safety of operations on board its submarines. Accordingly, no further action is warranted.

Survivability of the Ehime Maru

The design of the *Ehime Maru* was typical for a ship of that size and service. In addition to meeting industry standards for strength, the ship was fitted with transverse bulkheads and a double bottom in the engineroom to provide a measure of flotation and stability in the event of moderate damage from collision or grounding. This is typical of modern ship design, and the standards reflect historical experience with damages and international consensus on a reasonable degree of protection that should be provided. The damage sustained by the *Ehime Maru* far exceeded the criteria used for design, and the simultaneous flooding of several watertight compartments immediately doomed the ship. The damage scenario is so unusual and extensive that it is considered impractical to modify the basis of watertight design for ships of this size. Accordingly, this accident does not constitute a reason for review or revision of international standards of subdivision and damage stability.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the collision of the USS *Greeneville* with the Japanese fisheries training vessel *Ehime Maru* was the inadequate interaction and communication among senior members of the combat systems team (the commanding officer, the officer of the deck, the fire control technician, and the sonar supervisor), which resulted in the failure to perform adequate contact analysis and adhere to proper procedures for moving to periscope depth; and the commanding officer's decision to order an emergency surfacing maneuver. Contributing

to the cause of the accident was the failure of the crew, in particular the commanding officer, to adequately manage the civilian visitors so that they did not impede operations. Contributing to the loss of life was the rapid flooding and sinking of the *Ehime Maru*, which occurred when the submarine's rudder tore through the fishing vessel's lower deck spaces.

Adopted: September 29, 2005

Appendix A

Investigation

The National Transportation Safety Board learned of the *Greeneville/Ehime Maru* accident at 2118 on February 9, 2001, from news media reports. The Safety Board initially launched a five-person investigative team from the Office of Marine Safety, including the chief of the technical services division, an investigator-in-charge, an engineering specialist, a human performance specialist, and a survival factors specialist. A Board Member and representatives from the Safety Board's Office of Government, Public, and Family Affairs joined the team, and the group arrived in Honolulu about 1545 on Saturday, February 10, 2001. A naval architect and an aircraft structures specialist who was proficient in underwater recovery efforts subsequently joined the team. The naval architect documented the damage to the vessels, and the recovery specialist served as liaison to the Navy salvers.

The Safety Board investigated the accident under the authority of the Independent Safety Board Act of 1974, as amended, according to the Safety Board's rules. Team members interviewed the survivors of the *Ehime Maru* between February 11 and 13, 2001. The team also interviewed Coast Guard personnel involved in the search and rescue, emergency medical services officials, the American Red Cross supervisor, and the harbor pilot who took the *Ehime Maru* out of Honolulu. The Safety Board began interviewing crewmembers of the *Greeneville* on February 13, 2001. However, at the time, the CO, the XO, and the OOD-2 declined to assist in the Safety Board's accident investigation. These three officers were eventually interviewed by Safety Board investigators, as indicated below:

- September 2001—the OOD-2
- November 2001—the XO
- March 2002—the CO

The Safety Board also interviewed the commanders of Squadrons 1, 3, and 7, the instructor of the prospective commanding officers course, and the COMSUBPAC Deputy Chief of Staff for tactics and training in March 2002, and the former COMSUBPAC in May 2002.

The designated parties to the Safety Board's investigation were the U.S. Navy, the U.S. Coast Guard, and Ehime Prefecture, Japan, owner of the *Ehime Maru*.

Appendix B

Abbreviations and Acronyms

AVSDU	Analog-Video Signal Display Unit
CEP	contact evaluation plot
CO	commanding officer
COMSUBPAC	Commander, U.S. Submarine Force, Pacific (also command office for U.S. Submarine Force, Pacific)
EMBT	emergency main ballast tank
EPIRB	emergency position indicating radio beacon
ESM	electronic support measures
FAA	Federal Aviation Administration
FTOW	fire control technician of the watch
MHz	megahertz
OOD	officer of the deck (Note: in this report, the OOD of the second underway watch is referred to as the OOD-2)
OP	operations procedure
OPNAVINST	Chief of Naval Operations instruction
OPORD	operations order
ORM	operational risk management
PERIVIS	periscope video system
P/H	"Poppa/Hotel," the unmarked seaward entrance to Pearl Harbor
RHIB	rigid hull inflatable boat
SECNAVINST	Secretary of the Navy instruction
SLOGGER	sonar data logger
SNR	signal-to-noise ratio
SOLAS	International Convention for the Safety of Life at Sea
TMA	target motion analysis
UTC	Universal Coordinated Time
XO	executive officer

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Appendix C

Chronology of Events, February 9, 2001

Accident Events

Time	Activity
Pre-0500	Fire control officer of the watch (FTOW) checks fire control equipment in control room and finds that everything operates correctly.
Pre-0700	Navigator reports to commanding officer (CO) that the control room's Analog-Video Signal Display Unit (AVSDU), which provides a backup display of sonar data, is inoperative.
0730	CO greets 16 distinguished visitors at dockside as they board the Greeneville at Pearl Harbor. The distinguished visitors are assembled in the crews' mess, where they are given a brief presentation, including a slide show, about the submarine. They are broken into two groups for tours of the vessel.
0757	Greeneville departs berth.
0903	Navigator assumes watch as officer of the deck (OOD).
1017	Greeneville submerges.
1045	CO joins first group of distinguished visitors for lunch at first seating, which is from 1045 to 11:45.
1054	Deep dive.
1103-1131	Dive to classified depth.
1130	Underway watch change scheduled. FTOW assumes watch at fire control console. Sonar supervisor assumes watch in sonar room.
1143	Main propulsion assistant assumes watch as officer of the deck (OOD-2) in the control room.
1145	Executive officer (XO) joins second group of distinguished visitors for lunch at second seating, which is from 1145 to 1245.
1200	Sonar supervisor, in preparation for planned maneuvers, checks sonar stack for loose gear. Ehime Maru departs Honolulu.
1207	OOD orders course change to north (000°).
1228:59	Sonar begins tracking contact Skerra 12 (S-12).
1231:59	Sonar begins tracking contact S-13, bearing 358° (the Ehime Maru).
1232:59	Fire control system automatically generates first solution for S-13.
1240	OOD-2 orders baffle clear.
1242:16	Greeneville changes course to 240°, and sonar drops tracks on both S-12 and S-13 when they enter the baffle area.

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Time	Activity	
1245	Greeneville resumes northerly course.	
1257	Ehime Maru completes stowing anchor and increases speed to 11 knots.	
1306+/-	XO advises CO that ship needs to start maneuver demonstrations if submarine is to meet the distinguished visitors' scheduled return time to Pearl Harbor.	
1310+/-	Visitors enter control room; CO goes into sonar room to assay contact picture. Observes two contacts (S-12 and S-13) to the north and northwest.	
1314	CO enters control room and talks with visitors, advising them of the best locations to observe the submariner's maneuvers.	
1315	Greeneville increases speed to 14 knots and begins angle maneuvers ranging in depth from 150 to 650 feet.	
1315-1324	Sonar supervisor and sonar operators, while attempting to track targets, interact with five visitors who enter the sonar room.	
1324+/-	Sonar technician who returns to get his jacket asks visitors to leave the sonar room before Greeneville begins rudder maneuvers, or high-speed turns.	
1325	CO directs OOD-2 to order the following turns during the high-speed maneuvers: Greeneville to turn right from a course of 000° right to 140°.	
1328:27	Greeneville is steady on 140°.	Time steady on course until next turn: 16 sec.
1328:43	Greeneville to turn left to 340°.	--
1328:04	Greeneville is steady on 340°.	Time steady on course: 23 sec.
1328:27	Greeneville to turn right to 120°.	--
1329:47	Greeneville is steady on 120°.	Time steady on course: 23 sec.
1330:42	Greeneville completes high-speed maneuvers and comes left to 340°.	
1331+/-	CO directs OOD-2 to prepare to go to periscope depth and to be there within 5 minutes.	
1332	CO goes into sonar a second time to determine contact picture; watches as sonar regains S-12 at 1332:00 and S-13 at 1332:45.	
1332:54	Greeneville arrives at 150 feet from a depth of 400 feet.	Total time above layer depth* is 91 seconds.
1333	CO returns to control room; directs OOD-2 to order a baffle clear to course 120°.	
1333:00	Sonar begins tracking S-14.	
1334:48	Tracking solution entered for S-14; S-12 fades.	
1335	Baffle clear complete. OOD-2 orders sonar to report all contacts; sonar reports S-13 and S-14.	
1336	CO announces that he has "good feel" for contact picture (later stated that he thought the contacts were S-12 and S-13).	

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Time	Activity
1336:45	CO orders ship to periscope depth (60 feet).
1337:48	As submarine ascends, fire control solution is updated, indicating S-13 (the *Ehime Maru*) is within 4,000 yards.
1338	Submarine periscope breaks surface of water.
1339	OOD-2 conducts three rapid 360° periscope sweeps and reports "No close contacts." Under-instruction operator in ESM room reports "No close contacts" to the conn.
1339:04	CO takes periscope from OOD-2 and orders the ship to 58 feet.
1339:30	CO conducts periscope search in the direction where he believes S-12 and S-13 to be.
1340+/-	CO orders emergency deep. Total time at periscope depth: 69 sec.
1340	S-14 fades.
1340+	As submarine begins to descend, CO asks quartermaster the course to RH. Quartermaster responds 340°, and CO orders turn to 340°.
1340:34	Submarine starts to come left from 121° to 340°.
1342:26	*Greeneville* initiates EMBT.
1343:15	*Greeneville* collides with *Ehime Maru*. (Approximate heading of submarine is 016°.)

*Layer depth is the depth from the surface of the sea to the point above the first major negative thermocline (area of rapid decrease in water temperature) at which sound velocity is maximum.

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Search-and-Rescue Events

Time	Event
1343	Collision occurs.
1345	*Ehime Maru* sinks.
1345	*Greeneville* bridge manned.
1345	*Greeneville* radios report of collision to COMSUBPAC.
1355	COMSUBPAC reports collision to Coast Guard Group–Honolulu.
1356	Coast Guard Group–Honolulu diverts helicopter No. 6570 from patrol to scene.
1358	Group–Honolulu directs Coast Guard Station–Honolulu to launch rescue assets.
1400	Station–Honolulu dispatches rigid hull inflatable boat (RHIB) and a patrol boat to scene.
1400	Joint Rescue Coordination Center receives signal from *Ehime Maru*'s EPIRB.
1404	Joint Rescue Coordination Center identifies vessel as *Ehime Maru*.
1408	Joint Rescue Coordination Center contacts Coast Guard Group–Honolulu to investigate.
1420	COMSUBPAC calls Joint Rescue Coordination Center.
1427	Coast Guard helicopter No. 6570 arrives on scene.
1431	Coast Guard RHIB arrives on scene.
1444	Coast Guard patrol boat arrives on scene.
1445	Coast Guard helicopter No. 6570 transfers its rescue swimmer to patrol boat.
1445	COMSUBPAC sorties two torpedo retriever boats, *Hawthorne 5* and *Hawthorne 8*.
1446	Coast Guard helicopter No. 6570 begins area search.
1451	Coast Guard diverts C-130 aircraft from training to scene.
1505	Joint Rescue Coordination Center assumes control of search-and-rescue mission.
1524	Coast Guard C-130 plane arrives and assumes on-scene command.
1538	Coast Guard RHIB and patrol boat depart scene with 26 survivors.
1615	Rescue vessels arrive at Coast Guard Station–Honolulu.

NOTE: Search for missing crewmembers continued between February 9 and March 2. *Ehime Maru* was located on the seafloor in 2,000 feet of water on February 16.

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APPENDIX H

Kaka'ako Makai Vision and Guiding Principles

Kaka'ako Makai
Community Planning Advisory Council (CPAC)

KAKA'AKO MAKAI COMMUNITY PLANNING ADVISORY COUNCIL

THE VISION FOR KAKA'AKO MAKAI

The Hawaiian Place of Ka'akaukukui and Kukuluae'o

Kaka'ako Makai is the community's gathering place. A safe place that welcomes all people, from keiki to kūpuna, with enriching cultural, recreational and educational public uses. A special place that continues the shoreline lei of green with scenic beauty, connects panoramic vistas mauka to makai, and encourages ecological integrity of land, air and sea. Kaka'ako Makai honors, celebrates and preserves its historic sense of place, Hawaiian cultural values and our unique island lifestyle for present families and future generations.

GUIDING PRINCIPLES

Community Cultural Gathering Place

Establish Kaka'ako Makai as a gathering place where community and culture converge in response to the natural scenic beauty of the green shoreline open space.

- *Celebrate the intertwined cultures of the community by ensuring a welcoming gathering place for a broad cross-section of people diverse in age, income and ethnicity.*
- *Provide enriching public recreational, cultural and educational opportunities for residents and visitors alike through Kaka'ako Makai's scenic coastal and marine environment, the Native Hawaiian cultural heritage, compatible facilities and activities, and historic sites and settings.*

Hawaiian Culture and Values of the Ahupua'a

Base the framework for planning, decision-making and implementation of the Kaka'ako Makai master plan on Native Hawaiian values and traditional and customary rights and practices protected by the State.[1]

- *Emphasize the host Hawaiian culture.*[2]
- *Incorporate the ahupua'a concept and spirit of caring for, conserving and preserving the self-sustaining resource systems necessary for life, including the land that provides sustenance and shelter, the natural elements of air, wind and rain extending beyond the mountain peaks and streams of pure water, and the ocean from the shoreline to beyond the reef where fish are caught.*
- *Adopt the ahupua'a lifestyle of individual kuleana working together and contributing to the whole for a greater level of stewardship, conservation, and proper management of resources with contemporary land-use benchmarks, such as growth boundaries and carrying capacity.*
- *Assure that the planning of collective or individual traditional features, settings, and activities will be overseen by Hawaiian historic and cultural experts to prevent misinterpretation or exploitation.*

[1] Hawaii State Constitution, Article XII, Section 7. Inform the planning process by the principles and traditions of the ahupua'a, and inspire the master plan by the interconnected relationship of people.
[2] §206E-34(c)(5), Hawaii Revised Statutes. The Hawaiian host culture is emphasized as pre-eminent yet inclusive of other cultures.

1

Open View Planes

Protect, preserve and perpetuate Kaka'ako Makai's open view planes from the mountains to the sea as an inherent value of the Hawaiian ahupua'a and an important public asset for residents, visitors and future generations.[3]

- *Ensure planning and development safeguards to identify, document, retain, restore and protect makai-mauka and diamondhead-ewa open view planes to the Ko'olau mountains, Diamond Head (Lē'ahi) and the Wai'anae mountains as seen from the view vantage areas and vicinities of Kaka'ako Makai's public lands and Kewalo Basin Harbor.*

Coastal and Marine Resources

Preserve, restore and maintain Kaka'ako Makai's valuable coastal and marine resources for present and future generations.

- *Enable the monitoring, protection, restoration, and conservation of natural coastal and ocean resources, including reef and marine life, through responsible stewardship and sustainable practices.*
- *Protect and sustain the coastal environment for cultural uses including fishing, ocean gathering, surfing and ocean navigation.*

Expanded Park and Green Space

Ensure expansion of Kaka'ako Makai's shoreline parks as significant landscaped open spaces[4] *joining the lei of green parks extending from Diamond Head (Lē'ahi) to Aloha Tower.*

- *Implement the Hawaiian values of the ahupua'a and mālama 'āina by preserving shoreline open space, protecting scenic coastal and marine resources, and respecting the natural interaction of people, land, ocean and air.*
- *Welcome residents and visitors alike with green open space, abundant shade trees and opportunities for family recreation.*
- *Use the established park planning standard of at least 2 acres per 1000 residents as a benchmark to assure sufficiency of park space to contribute to the health and welfare of Kaka'ako Mauka's growing population and offset increased urban density, noise and pollution.*

Public Accessibility

Provide open and full public access to recreational, cultural and educational activities within and around Kaka'ako Makai's parks and ocean shoreline.

- *Ensure complete public recreational access with minimal impact to the environment, including drop-off accommodation of ocean recreation equipment and connections to public transportation.*
- *Provide a shoreline promenade and tree-lined paths to safely and comfortably accommodate pedestrians, bicyclists and the physically impaired.*
- *Provide sufficient shared parking complementary to the natural setting to support all uses in Kaka'ako Makai, with workplace parking available for recreational and cultural users during non-working hours.*

[3] Significant Panoramic Views Map A-1, Honolulu Primary Urban Center Development Plan.
[4] Inclusive of Kewalo Basin Park, Kaka'ako Waterfront Park and Kaka'ako Gateway Park.

2

Public Safety, Health and Welfare

Ensure that Kaka'ako Makai is a safe and secure place for residents and visitors.

- *Keep public use areas safe day and night for public comfort and enjoyment.*
- *Ensure that exposure to land and ocean is environmentally safe for people and marine life by assuring timely investigation, determination, and remediation of contaminates.*
- *Ensure that Kaka'ako Makai remains free and clear of elements, activities and facilities that may be potentially harmful to the natural environment and public well-being, including laboratories containing and experimenting with Level 3 or higher bio-hazardous pathogens and/or biological toxins known to have the potential to pose a severe threat to public health and safety.*[5]

Public Land Use Legislation – Public Use of Public Lands in the Public Interest

Recognize and respect the effort and intent of the Hawaii State Legislature to uphold the greater public interest by ensuring and sustaining public uses on Kaka'ako Makai State public lands for the greater public good.

- *Preclude the sale of public land and development of housing in Kaka'ako Makai;*[6]
- *Demonstrate commitment to serve the highest needs and aspirations of Hawaii's people and the long-term good of Hawaii's residents and future generations through community-based planning;*[7]
- *Restore the site-dependent use of Kewalo Basin Cove to the Kewalo Keiki Fishing Conservancy.*[8]

Kewalo Basin

Ensure that Kewalo Basin Harbor's unique identity is retained with continued small commercial fishing and excursion boat uses, keiki fishing and marine conservation, marine research and education, and accessible green park open space expanding the lei of green between Ala Moana Park and Kaka'ako Waterfront Park.

- *Enable continued functional commercial boating uses at Kewalo Basin Harbor*[9] *and preserve the beneficial relationships between the existing small commercial fishing and excursion boat businesses and land-based maritime support service businesses.*
- *Ensure that Kewalo Basin will continue as a State of Hawaii commercial harbor and valuable public facility asset by repairing, maintaining and enhancing the harbor for small commercial fishing and excursion boat use.*
- *Ensure the protected use of Kewalo Basin Cove for Kewalo Keiki Fishing Conservancy keiki fishing and marine conservation programs.*
- *Support Kewalo Marine Laboratory's continued valuable marine biology and ecosystems research and education in the vicinity of Kewalo Basin.*
- *Ensure preservation of Kewalo Basin Park, the net house and parking lot for public use, upgrade and improve existing facilities within the park, and provide green open space between Ala Moana Park and the channel frontage.*[10]

[5] Protection of the public health and safety is first and foremost in this area a) immediately adjacent to a Shoreline recreation area and the urban population center, b) in close proximity to a regional beach park and the Waikiki primary visitor destination, and c) within the updated tsunami zone.
http://beta.abc3340.com/news/stories/1007/460171.html http://www.nytimes.com/2007/10/05/us/05labs.html?_r=1
[6] §206E-31.5, Hawaii Revised Statutes.
[7] HCR 30, 2006.
[8] Act 3, 2007, Special Session.
[9] §206E-33(2), Hawaii Revised Statutes.

Cultural Facilities

Offer public enrichment opportunities through both fixed and flexible cultural facilities that celebrate the diverse cultures of Hawai'i and blend compatibly with the shoreline open space.

- *Contemplate compatible indoor and outdoor performance venues that encourage the teaching, practicing, and presentation of hula, theater, music, dance, and other performing and visual arts, with an outdoor multi-cultural festival space for Honolulu's diverse ethnic communities.*[11]
- *Contemplate educational facilities, such as an exhibition hall with permanent, interactive and rotating exhibits, museums communicating the cultural history of the area, and places for traditional Hawaiian cultural practices.*[12]
- *Establish a cultural market stocked by local farmers, fishers and Hawaiian traditional craft makers to reflect the Hawaiian values of gathering and trading in the ahupua'a between the mountains and the sea.*[13]
- *Ensure a community center for local families to gather, interact and learn from each other.*

Small Local Business

Apportion a limited number of small local businesses to assist in cooperatively sustaining Kaka'ako Makai's public use facilities.

- *Ancillary small businesses may include diverse local restaurants, cafés, small shops, markets or other uses that will complement the recreational, cultural, harbor or other public facilities serving the community interest.*[14]
- *Encourage small local enterprises that emphasize the Hawaiian culture and support traditional local products, rather than large corporate retailing attractions.*

Site Design Guidelines – A Hawaiian Sense of Place in Landscape, Setting and Design

Ensure that Kaka'ako Makai's public use facilities are compatible in placement, architectural form, and functional design within the landscape of the shoreline gathering place.[15]

- *Provide and maintain abundant native coastal plants and trees to blend the scenic and sensory qualities of the coastal environment and create a Hawaiian sense of place.*
- *Identify, protect, preserve, restore, rehabilitate, interpret and celebrate Kaka'ako Makai's historic sites, facilities, settings, and locations.*
- *Maintain the quality of coastal environmental elements including natural light, air and prevailing winds.*
- *Mandate sustainability principles, conservation technologies, and green building standards for buildings, grounds and infrastructure.*[16]

[10] Inclusive of greenbelt connections between Ala Moana Park and Kewalo Basin Park, between the Net House and Kewalo Basin Channel, and between Ala Moana Boulevard and Kewalo Basin to Point Panic.
[11] §206E-34(d)(3), Hawaii Revised Statutes.
[12] §206E-34(d)(5), Hawaii Revised Statutes.
[13] §206E-34(a) and (b), Hawaii Revised Statutes.
[14] §206E-34(d)(2), Hawaii Revised Statutes.
[15] Encourage private development mauka of Ilalo Street to compliment the gathering place concept of the Kaka'ako Makai public use area on public lands by providing landscaped set-backs and inviting open architecture at the street level.
[16] Ensure reasonable carrying capacity with limited infrastructure for sufficient water supply, storm-water drainage and waste disposal.

Community/Government Planning Partnership

The Kaka'ako Makai Community Planning Advisory Council places the public interest first and foremost, and will strive to uphold the greater good of the community in partnership with the HCDA as the public oversight agency by:

- *Openly working with the community, the HCDA and the HCDA's planning consultants as guaranteed by government commitment to ongoing community representation and involvement throughout the master planning process;*
- *Openly communicating with the State Legislature and other elected public officials;*
- *Committing the time and effort required to meet the goals and objectives of the Kaka'ako Makai planning process, and advocating responsibly in the public interest both collectively and individually, notwithstanding premature or conflicting proposals.*

Future Funding and Management

Assure and assist viable and sustainable operation of public uses and facilities on State public land in Kaka'ako Makai through public/private partnerships and 501(c)(3) non-profit management[17] similar to successful park conservancies and their stewardship programs.

- *The community land conservancy will be essential in determining safeguards to restore, protect and perpetuate Kaka'ako Makai's natural shoreline resources and view planes, historic and recreational resources, and public uses on State public lands in the public interest as a quality of life benchmark.*
- *This conservancy may be a public/private partnership of the Kaka'ako Makai Community Planning Advisory Council (CPAC), the Hawaii Community Development Authority (HCDA) or current oversight agency, and private contributing interests to both monitor and underwrite public use on State pubic land in service to the public good.[18]*

[17] §206E-34(c)(3), Hawaii Revised Statutes.
[18] A public/private community benefits agreement may be developed upon completion of the master plan to define respective responsibilities and contributions.

Appendix D:
Transportation Impact Analysis

Hawaii Community Development Authority

TRANSPORTATION ANALYSIS FOR KAKA`AKO TRANSIT-ORIENTED DEVELOPMENT OVERLAY PLAN

***Revised* Final Report**
May 1, 2015

NELSON
NYGAARD

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Cover image: HCDA ©

INTRODUCTION

1.1 PURPOSE

The purpose of this report is to provide an assessment of transportation impacts that could result from adoption and implementation of the Draft TOD Overlay Plan[1] ("TOD Alternative A"). Where impacts are identified as significant, based on the significance criteria described in this section, the report identifies potential transportation mitigations. The results of this assessment will be incorporated into an Environmental Impact Statement (EIS).

The EIS will assess the impacts of three alternatives: the Future Baseline Condition, TOD Alternative A, and TOD Alternative B. TOD Alternative B was developed as part of a legislative action seeking to examine a lower density alternative to the Draft TOD Overlay Plan (the "TOD Alternative A"). Analysis on TOD Alternative B indicates that this alternative will likely be about 90% of the density in TOD Alternative A. Thus, TOD Alternative A represents the Worst Case Scenario in this transportation analysis. No TOD Alternative B is evaluated in this report due to this fact. It should be assumed that any impact in TOD Alternative B will be less than what is displayed in TOD Alternative A in this report.

Project Location

The project location is shown on Figure 1. The TOD Alternative A encompasses the Kaka`ako Community Development District (KCDD) including the Aloha Tower Special District. The KCDD is comprised of two areas. The first is approximately 450 acres on the mountain (mauka) side of Ala Moana Boulevard, and is bounded by Piikoi Street, Punchbowl Street and King Street. It is hereinafter referred to as the "Mauka Area." The second area in the KCDD is approximately 151.6 acres on the ocean (makai) side of Ala Moana Boulevard. It is bounded by Ala Moana Regional Park and Pier 1 of the Honolulu Harbor, It is hereinafter referred to as the "Makai Area." The Aloha Tower Special District is comprised of approximately 3.4 acres located on the ocean side of Ala Moana Boulevard bounded by Richard Street, Bishop Street and Aloha Tower Drive. The total area addressed in TOD Alternative A is approximately 604 acres.

The KCDD is composed of several sub-neighborhoods, each with its own unique character. With the exception of the Makai District and Aloha Tower Special District, these neighborhoods were defined in the Mauka Area Plan and Rules based on existing and emerging land uses, building forms, and land tenure patterns combined with the influences of major transportation corridors and adjacent districts. Each neighborhood with its own distinct character will be influenced differently from the provisions laid forth in the TOD Alternative A. Recognizing this, the intent of implementing transit oriented development is not to redefine the existing character of the existing neighborhoods, but to utilize TOD to enhance the existing quality of Kaka`ako as a whole.

Figure 1 Project Location & Regional Context

1.2 METHODOLOGY

Travel Modes

This transportation analysis provides an assessment of potential impacts to the following modes of transportation:

- Bicycle circulation
- Motor vehicle circulation
- Pedestrian circulation
- Public transit

Analysis Scenarios

The planning horizon for the TOD Overlay Plan is 2035. The transportation analysis is based on a comparison of transportation conditions under each of the following three scenarios:

- **Existing Conditions** –A review of existing multi-modal transportation conditions within the study area based on observations and data collected in 2013.
- **Year 2035 Conditions with No Action (Future Baseline Condition)** – An assessment of future multi-modal transportation conditions in the 2035 horizon year, based on planned transportation network changes and anticipated future development allowable development under the current adopted land use plan for the area. The Future Baseline Condition constitutes "no action" because it represents what will happen in the district under the existing Rules (without implementation of the TOD Overlay Plan).
- **Year 2035 Conditions with TOD Alternative A** – An assessment of future multi-modal transportation conditions in the 2035 horizon year, based on proposed transportation network changes and anticipated development under the TOD Alternative A.

Travel Demand Modeling

The Oahu Metropolitan Planning Organization (OMPO) travel demand model was utilized to develop 2035 travel demand forecasts for purposes of comparing the Future Baseline Condition and TOD Alternative A. Forecasts of total daily travel to, from and within the study area were derived from the model based on the anticipated land use and transportation network changes. Future-year changes to AM and PM peak hour turning movements at key intersections were also derived from the OMPO model, for purposes of comparing AM and PM Peak Hour traffic operations at key intersections selected for analysis.

A detailed breakdown of existing and future land uses, under the Future Baseline Condition and TOD Alternative A, was provided to Nelson\Nygaard for each transportation analysis zone (TAZ) in the project area. Based on that land use data, the OMPO model was updated for purposes of forecasting travel demand based under both the Future Baseline Condition and TOD Alternative A.

1.3 SIGNIFICANCE CRITERIA

For purposes of the environmental impact statement (EIS), transportation impacts are considered significant if the TOD Alternative A results in unacceptable conditions based on local significance criteria. This analysis applies the multi-modal significance criteria that were identified in the *2009 Kaka`ako Mauka Area Plan Supplemental EIS* (2009 SEIS)[ii]. The criteria are as follows:

Motor Vehicle Traffic Impact Criteria

- *The operational impacts on intersections are considered significant if plan-related traffic causes the level of service to deteriorate from LOS E or better under the Future Baseline Condition to LOS F under the TOD Alternative A.*
- *The operational impacts on signalized intersections operating at LOS F under both the Future Baseline Condition and TOD Alternative A are considered significant if the volume-to-capacity (v/c) ratio under the TOD Alternative A exceeds that of the Future Baseline Condition.*

Transit Impact Criteria

- *The operational impacts on transit facilities are considered significant if the plan causes a substantial increase in transit demand that could not easily be accommodated by available transit capacity, resulting in unacceptable levels of transit service. A capacity utilization above 80 to 90 percent is generally considered unacceptable for urban transit services.*
- *The operational impacts on transit facilities are considered significant if the plan causes a substantial increase in operational delay or costs that could result in adverse impacts to transit service.*

Bicycle Impact Criteria

- *The operational impacts on bicycle facilities are considered significant if the plan would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.*

Pedestrian Impact Criteria

- *The operational impacts on pedestrian facilities are considered significant if the plan would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.*

1.4 PROJECT OVERVIEW

This transportation assessment is based on the Project Description in the Draft Kaka`ako TOD Plan EIS[iii] provided to Nelson\Nygaard on July 3, 2013. The Project Description is summarized below.

Background

In 2005 the HCDA embarked on a comprehensive review of the Mauka Plan and Rules to address livability, urban design and update aging infrastructure needs. This Plan was developed around smart growth concepts, and was adopted in 2011. An environmental impact statement (EIS) was prepared to assess the impacts of the proposed rules. In 2011, the Governor accepted the Final Supplemental EIS for the Draft Mauka Area Plan as fulfilling the requirements of Chapter 343, HRS. The HCDA Board subsequently approved the rules implementing the Mauka Area Plan.

As set forth in the 2011 Conceptual Master Plan for the Makai District, the area of the KCDD makai of Ala Moana Boulevard (and including the Aloha Tower Special District) is envisioned as the community's gathering place that welcomes all people with enriching cultural, recreational, and educational public uses.

In 2012, the Honolulu City Council approved an alignment for the Honolulu Authority for Rapid Transit (HART) elevated light-rail transit system. The alignment identified three transit stations in lands under the authority of the HCDA: two in Kaka`ako and one at the Aloha Tower Special District. In response to this action, HCDA retained consultants to prepare a plan to address the opportunities presented by the introduction of an elevated light rail system in Kaka`ako.

The Draft Transit Oriented Development Overlay Plan (hereinafter, "the Draft TOD Overlay Plan", "the Plan", or "the TOD Alternative A") is a supplementary action that endorses the Comprehensive Plan for the Makai Area (2011), together with the Mauka Area Plan (2011) smart growth objectives. The Draft TOD Overlay Plan further focuses growth with an emphasis on transit-oriented development (TOD), and transit-supportive transportation planning strategies. The Draft TOD Plan's purpose is not to redefine the vision from this earlier effort, but rather, to utilize TOD to enhance Kaka`ako as a whole and the Mauka Area in particular. Related efforts have included station area planning by the City & County of Honolulu along the HART proposed alignment.

Figure 2 Kakaako Community Development District (KCDD) & Planned HART Alignment

Future Baseline Condition

The Future Baseline Condition is used to provide a point of departure from which to measure the impacts of the TOD Alternative A. The Future Baseline Condition represents how the KCDD would appear if it were developed in accordance with the prevailing rules by the target year 2035. In other words, it considers the following question: if no action were taken other than the continued implementation of the Mauka Area and Makai Area Rules, what would be the result?

Under the Future Baseline Condition, the KCDD would be built out to the density envisioned by the Mauka Area Plan (2011) and the Conceptual Makai Area Plan (2011). Both the TOD Alternative A and the Future Baseline Condition investigate the capacity of the KCDD at full build out under existing and proposed regulatory environments. The resulting analysis will guide actions to mitigate impacts associated with the implementing ordinance for the Draft TOD Overlay Plan.

The following principles are presented in the Urban Design element of the Mauka Area Plan. They describe the vision for the KCDD in 2035 under the prevailing rules:

- Create an outstanding pedestrian environment.
- Create a network of green streets.
- Provide a maximum of road connections.
- Connect pedestrian paths across major thoroughfare.
- Strong Mauka-Makai linkage.
- Support the small-lot, mixed use pattern of Central Kaka`ako.
- Support TOD.

The Future Baseline Condition assumes that the project site will retain its current development parameters and land uses as allowed under the Mauka Area Rules (2011), Makai Area Rules (2005) and adopted Master Plans for Kamehameha Schools and Ward Center. All existing planning and implementation policies and existing development regulations would continue to guide development decisions for properties within the project area. This scenario would extend negotiated agreements in each of the Master planned areas and assumes that no new changes would occur to land use or transportation in the KCDD other than those already programmed as part of existing City or HCDA plan or proposed by other agencies. This scenario does not include direct coordination with the HART alignment or mitigations that will capture the value of this public investment. This scenario does not include Complete Streets planning policies.

The target year 2035 was determined by the availability of population forecasts developed by other agencies, including the State's Department of Business, Economic Development & Tourism ("DBEDT") and the City and County of Honolulu's Department of Planning and Permitting. The target year is not based upon market assumptions. No market analysis has been conducted. Rather, HCDA is responsible for putting rules in place to guide the redevelopment of the KCDD, irrespective of market conditions. Thus, for the purposes of this EIS, 2035 is identified as the target year for full build out in both the Future Baseline Condition and TOD Alternative A.

TOD Alternative A (Draft TOD Overlay Plan)

For the purposes of this environmental impact statement, the TOD Alternative A is defined as the development activity envisioned in the Draft TOD Overlay Plan.

The primary purpose of the Draft TOD Overlay Plan is to coordinate future urban redevelopment with the provision of HART rapid transit so that residents, employees and visitors can take advantage of improved mobility choices. Land use policies in the Plan focus intensive mixed-use redevelopment into identified areas near to proposed HART transit stations.

The Draft TOD Overlay Plan also provides a comprehensive set of policies that aim to create a network of safe and comfortable streets with convenient access to HART stations. The Plan provides tools to introduce integrated transportation management, requirements for improved street connectivity, trip reduction (transportation demand management) measures, transit enhancements (feeder service, connectors and local bus enhancements), pedestrian and bike improvements, shared parking, and parking pricing. The Plan proposes no new development in the Makai District related to the proposed transit stations; however it envisions the integration of the Complete Streets concept throughout the Mauka and Makai Districts.

T he TOD Overlay Plan responds to the recent approval of the HART elevated rail system and the designation of three transit station locations within the KCDD. The coming introduction of rail transit - in parallel with community-driven interest in creating a city that is highly walkable, friendly and safe for cyclists – is an important reason for adopting the Draft TOD Overlay Plan. However the rail system is only an one outcome of a much broader movement to bring vitality to urban Honolulu, reflecting the values of the native Hawai`ian culture, particularly stewardship of the land and environment, preservation of the native culture, openness to the visiting world, and responsibility to local people and their prosperity.

The analysis of the TOD Alternative A tests the policy measures included in the Draft TOD Overlay Plan. This analysis includes a likely "best guess" scenario for the maximum development envelope given location and general economic factors. It explores the potential for proposed high rise building types and more intensive density allocations. A primary consideration of the TOD Overlay Alternative is how land use change might both respond to and support the HART rapid transit system as well as supplementary improvements for walking and cycling to create a pedestrian and transit friendly environment.

Potential Development under Future Baseline Condition & TOD Alternative A

Table 1 provides a comparison of potential land use buildout in the Year 2035 plan horizon year under the TOD Alternative A and Future Baseline Condition, as well as a comparison with Year 2010 land uses. As shown:

- Under the Future Baseline Condition, potential development in the KCDD would represent a net increase of approximately 18 million square feet of residential development and nine million square feet of non-residential space.
- The TOD Alternative A would potentially accommodate an additional 14 million square feet of residential development, as compared to the Future Baseline Condition. It would reduce the amount of non-residential space accommodated by about two million square feet as compared to the Future Baseline Condition.

Table 1 Land Use Comparison: Future Baseline Condition and TOD Alternative A

Land Use	Existing (2010)	Future Baseline (2035)	Future Baseline + TOD Alternative A (2035)
Residential	8,500,646 sq.ft.	28,562,707 sq.ft.	42,028,459 sq.ft
Non-residential	9,987,945 sq.ft.	19,033,286 sq.ft	16,771,407 sq.ft

Source: Draft Project Description for Kaka`ako TOD Plan EIS, July 3, 2013

EXISTING CONDITIONS

This section describes existing multi-model transportation conditions including:

- Existing trip generation and travel mode choice patterns
- Motor vehicle traffic
- Public transit service
- Bicycle circulation
- Pedestrian circulation

2.1 TRIP GENERATION & TRAVEL MODES

The regional trip generation model utilized by the Oahu Metropolitan Planning Organization (OMPO) accounts for a range of factors effecting transportation demand including land uses, number of households, and employment. Based on the regional distribution of land uses and transportation facilities, the model estimates the number of trips between origins (e.g. residences) and destinations (e.g. retail, employment). The model further estimates the portion of trips that occur via motor vehicle, transit, bicycling and walking.

Volume of daily trips (by all modes) is estimated by the OMPO model based on the existing mix of land uses within the traffic analysis zones (TAZ's) that include the KCDD.

- The TAZ's in the KCDD are currently developed with an estimated 11,887 residential units
- Non-residential uses within the TAZ's provide an estimated 36,219 jobs - 7,916 retail jobs and 28,303 non-retail jobs.

Based on the existing mix of land uses, the OMPO model[iv] estimates that 286,000 daily trips are made to, from, and within the study area:

- **Approximately 77 percent of daily trips are made via automobile** – including carpool trips. Based on estimated vehicle occupancy, the OMPO model estimates that existing land uses generate 184,797 daily vehicle trips. Since traffic studies frequently focus on traffic operations during the "peak hours" that coincide with morning and afternoon work-commute periods, the OMPO model also provides an estimate of peak-hour motor vehicle trip generation. It forecasts 13,822 vehicle trips generated during the AM Peak Hour and 9,249 vehicle trips generated during the PM Peak Hour.
- **Approximately seven percent of daily trips are made by transit** – an estimated 20,655 daily transit riders. The OMPO model does not provide an estimate of peak-hour transit ridership (instead, the peak-period transit ridership forecast is based on multi-hour morning and afternoon peaks).
- **Approximately 16 percent of daily trips are walk or bicycle trips** – an estimated 44,466 daily walk or bicycle trips.
- **Approximately 37 percent of daily trips are internal to the study area.** The portion of "internal trips" is a function of the mix of land uses.

Table 2 summarizes the estimate of existing daily trip generation derived from the OMPO Model.

Table 2 Trip Generation by Existing Land Uses (OMPO Model Estimate)

	Vehicle Trips			Transit Trips	Walk/Bike Trips
	AM Peak Hour	PM Peak Hour	Daily	Daily	Daily
Existing Conditions (2015 Base Year)	13,822	9,249	184,797	20,655	44,466

Work Trips by Existing Residents[v]

Census data on the journey to work is frequently used as a source for mode share data, because it is one of the few universally available data sets that permits "apples to apples" comparisons. Figure 5 provides a summary of travel mode data for "journey to work" trips by area residents, based on data provided for Census Tract 37, Census Tract 38, and Census Tract 39 (thus comprising an area slightly larger than the project area).

As shown on Table 3, over 16 percent of area residents walk to work, while the rate of bicycling to work (3.6 percent) is nearly as high as the rate of transit ridership to work (3.8 percent).

Figure 3 Kaka`ako Census tracts

Census tracts 37, 38 & 39
Source: US Census Bureau

Table 3 Existing Travel Modes: Work Trips by Existing Residents

Workers 16 years and over	Census Commute Mode Share
Car, truck, or van	70.6%
Drove alone	58.1%
Carpooled	12.5%
In 2-person carpool	10.4%
In 3-person carpool	0.0%
In 4-or-more person carpool	2.0%
Public transportation (excluding taxicab)	3.8%
Walked	16.2%
Bicycle	3.6%
Taxicab, motorcycle, or other means	2.4%
Worked at home	3.4%

Source: United States Census Bureau, American Community Service 5-year Estimate, S0801 (Census Tracts 37, 38 & 39)

Mode Share Comparison

Table 4 provides a comparison of travel mode shares for total daily trips, based on the OMPO model, and work trips for Kaka`ako area residents (based on the US Census data summarized above).

- Rates of walking and bicycling to work are high for work trips by Kaka`ako residents – nearly 20 percent walk or bicycle to work – reflecting the proximity of Kaka`ako residences with nearby jobs, within KCDD and in adjacent employment and commercial areas including downtown and the Ala Moana Center.
- The overall rate of walking and bicycling to and from Kaka`ako (Total Daily Trips based on the OMPO model), which includes non-work trips by residents and non-residents, is estimated at under 15.5 percent.
- The rate of transit use is over 7 percent for all trips to and from Kaka`ako, compared to less than 4 percent for Kaka`ako residents. –This difference reflects residents' greater propensity for walking and bicycling to nearby jobs as noted above.
- Note that the data comparison shown on Table 4 is not strictly an "apples to apples" comparison, since the percentage of workers that "work at home" is also included in the U.S. Census data.

Table 4 Existing Travel Mode Comparison

	Total Daily Trips to/from Kaka'ako (Base Year 2015 OMPO Model)	Work Trips Only – Kaka`ako Residents (US Census Journey-to-Work Data)
Motor Vehicle (including motorcycle & taxi)	77.3%	73.0%
Walk + Bicycle	15.5%	19.8%
Public Transit	7.2%	3.8%
Work at Home	N/A	3.4%

2.2 STREET NETWORK

The major Ewa -Diamond Head (east-west) connections are: Ala Moana Boulevard, and Kapiolani Boulevard. The secondary connection is Queen Street.

- **Ala Moana Boulevard** (State Route 92) is a 6-lane east-west arterial street through the southern portion of the KCDD that connects to the west with Nimitz Highway to the west, and connects Downtown Honolulu, Kaka`ako, Ala Moana Center and areas to the east near Waikiki. Pedestrian crossing distances are over 70 feet at most locations. No bicycle lanes are provided.
- **Kapiolani Boulevard** is a 6-lane east-west arterial street through the northern portion of the KCDD that connects areas to the east near Waikiki with Kaka`ako, and Downtown Honolulu via King Street. Pedestrian crossing distances are approximately 64 feet at most locations. No bicycle lanes are provided.
- **Queen Street** is a 2-lane collector street between Kamakee and Cooke Streets, widening to 4 lanes west of Cooke Street to downtown. Pedestrian crossing distances are generally 44 feet or less. Sidewalks are missing on some segments. No bicycle lanes are provided.

The major Mauka - Makai (north-south) connections are: Ward Avenue, Piikoi Street, and Punchbowl Street. Secondary connections are: South Street, Cooke Street, and Kamakee Street.

- **South Street** and **Punchbowl Street** are north-south collector streets at the western edge of the study area that connect Ala Moana Boulevard and King Street. Crossing distances vary, generally between 54 to 64 feet. No bicycle lanes are provided.
- **Cooke Street** is a 4-lane street that extends from south of Ala Moana Boulevard to King Street. Crossing distances are approximately 44 feet at most locations. No bicycle lanes are provided.
- **Ward Avenue** is a 4-lane north-south collector that extends from the south of Ala Moana Boulevard to the north of King Street. Crossing distances are approximately 64 feet at most locations. No bicycle lanes are provided.
- **Kamakee Street** is a 4-lane north-south street that connects Ala Moana Boulevard and Kapiolani Boulevard, to the east of Ward Avenue. Crossing distances vary between approximately 44 to 58 feet. No bicycle lanes are provided.
- **Piikoi Street** is a north-south arterial street at the eastern edge of the study area that connects with Ala Moana Boulevard to the east of the KCDD, adjacent to the Ala Moana Center. North of Kapiolani Street: Piikoi serves one-way northbound motor vehicle traffic, while southbound traffic travels one block west on Pensacola Street. Crossing distances vary, generally between 60 to 64 feet. No bicycle lanes are provided.

A map of the roadway network serving the area is shown on Figure 4, based on the street typologies described in the *Mauka Area Thoroughfare Plan*. Estimated daily traffic volumes on key corridors are shown on Figure 5.

A description of right-of-way widths within the study area is provided on Table 5.

Figure 4 Street Network Map

Source: Mauka Area Plan, HCDA, 2009

Figure 5 Key Traffic Corridors within KCDD

Existing Street Dimensions

Street types and right-of-way widths are summarized on Table 5. Cross-section drawings showing existing lane allocations and travel-way widths are provided for each of the primary streets serving the study area on Figures 6 to 8. On-street parking restrictions by street frontage are summarized on shown on Figure 9.

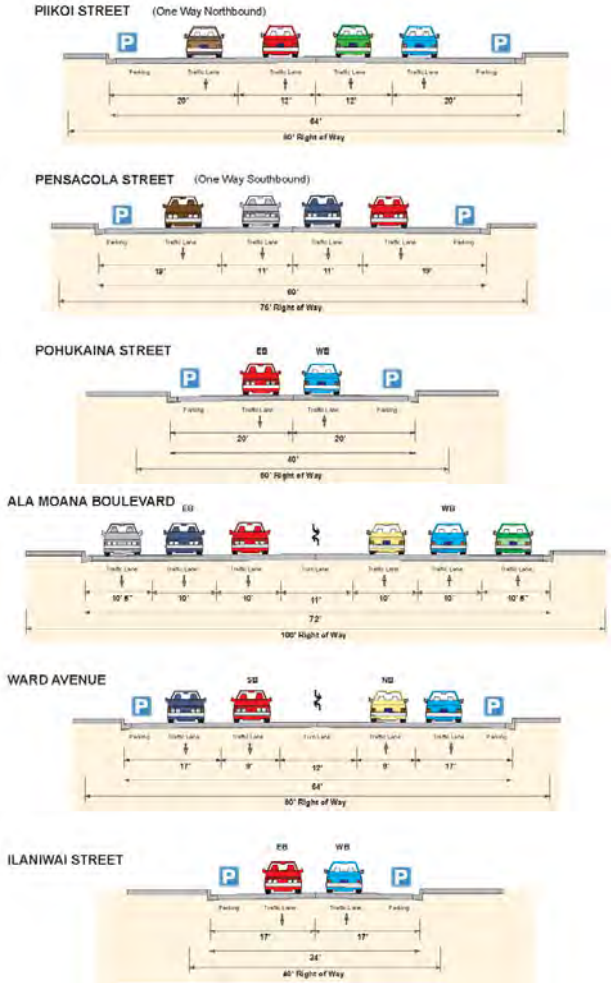
Kakaako Community Development District TOD Overlay Plan | FEIS Transportation Analysis
Hawaii Community Development Authority

Table 5 Street Types & Right-of-way Widths

Street Name	Road Type	Right-of-Way Width (feet)
King	Avenue	90'
Kapiolani	Boulevard	100'
Queen	Street	Varies, 50'-60'
Queen Extension/ Waimanu	Street	100'
Halekauwila	Street	60'
Pohukaina	Promenade Street	60'
Auahi (Ward to Queen Lane)	Promenade Street	60'
Auahi (Ahui Ext. to South)	Promenade Street	60'
Ala Moana Boulevard	Promenade Boulevard	100'
Waimanu (Dreier to Kamakee)	Service Street	40'
Kawaiahao	Street	50'
Ilaniwai	Service Street	40'
Kona	Service Street	40'
Hopaka	Alley	19'
Punchbowl	Promenade Avenue	70'
South	Avenue	Varies, 66'-80'
Cooke	Promenade Street	60'
Ward Avenue	Promenade Avenue	80'
Kamakee	Promenade Street	76'
Piikoi	Avenue	80'
Pensacola	Avenue	76'
Keawe	Street	50'
Coral	Service Street	40'
Emily	Service Street	40'
Curtis	Service Street	40'
Dreier	Service Street	40'
Koula (Ala Moana to Halekauwila)	Service Street	40'
Ahui & Ahui, Extension to Ala Moana	Street	50'
Cummins Extension (Queen to Ala Moana)	Street	50'

Source: Kaka`ako Final Supplemental Environmental Impact Statement – Volume I, HCDA, 2009

Figure 6 Existing Street Cross-sections



Source: Kaka`ako Mauka Area Plan SEIS Transportaton Analysis, April 14, 2009

Figure 7 Existing Street Cross-sections

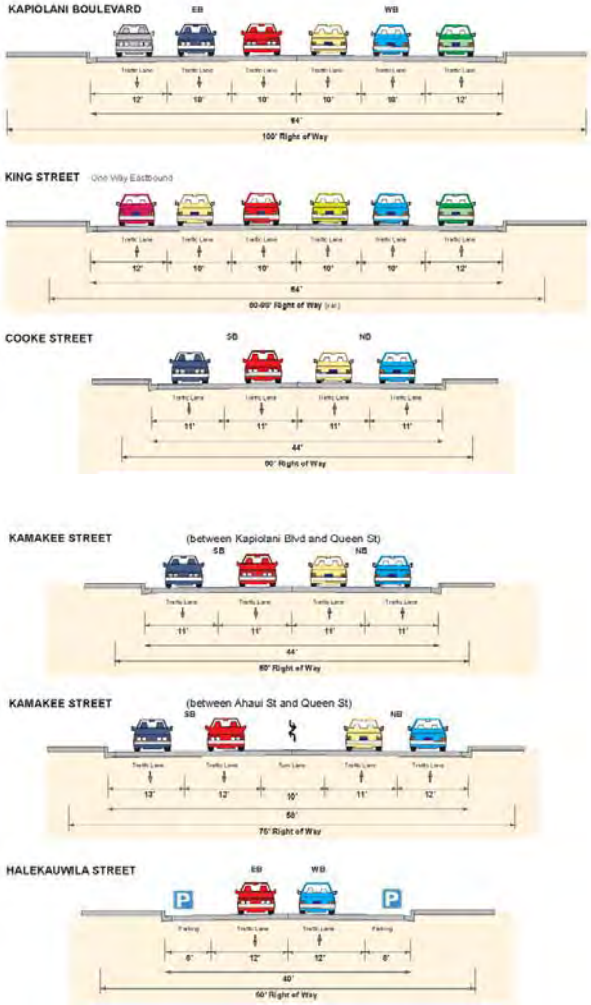


Figure 8 Existing Street Cross-sections

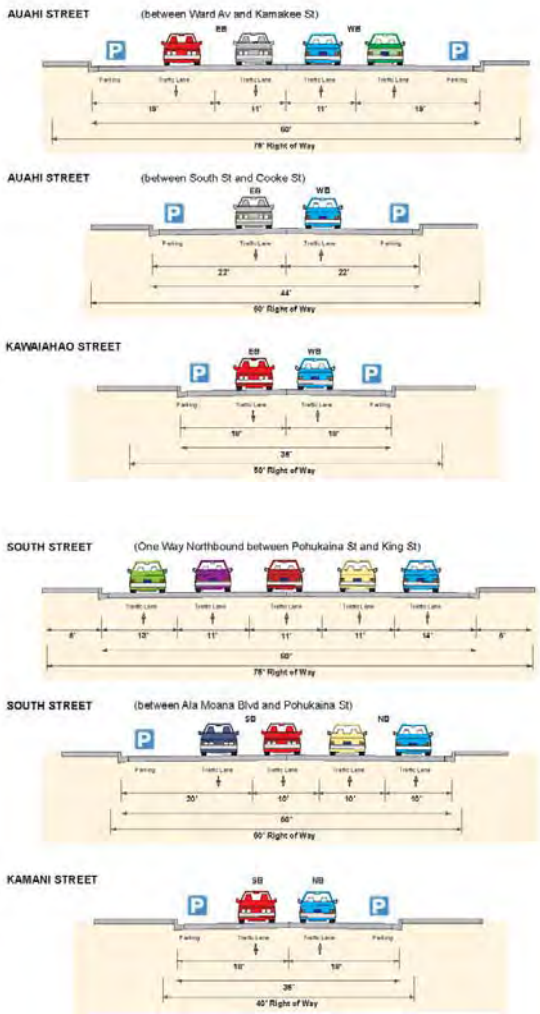


Figure 9 Motor Vehicle Parking Restrictions

2.3 TRAFFIC OPERATIONS

Study Intersections

Based on the criteria described in Section 1.6, the significance of impacts resulting from the TOD Alternative A is based on the effect on key intersections. The majority of study intersections are located on the key east/west and north/south transportation corridors that provide access to KCDD, downtown, and Ala Moana Center.

Figure 10 shows the location of each study intersection. HCDA selected the following 48 study intersections for this analysis:

1. Kapiolani Boulevard/South Street/King Street
2. Kapiolani Boulevard/Ward Avenue
3. Kapiolani Boulevard/Kamakee Street
4. Kapiolani Boulevard/Pensacola Street
5. Kapiolani Boulevard/Piikoi Street
6. Ala Moana Boulevard/South Street
7. Ala Moana Boulevard/Keawe Street
8. Ala Moana Boulevard/Coral Street
9. Ala Moana Boulevard/Cooke Street
10. Ala Moana Boulevard/Ward Avenue
11. Ala Moana Boulevard/Kewalo Basin
12. Ala Moana Boulevard/Kamakee Street
13. Ala Moana Boulevard/Queen Street
14. Ala Moana Boulevard/Piikoi Street
15. Ward Avenue/Auahi Street
16. Ward Avenue/Halekauwila Street
17. Ward Avenue/Queen Street
18. Piikoi Street/Ala Moana Shopping Center/Hawaiki Tower
19. Piikoi Street/Waimanu Street
20. Piikoi Street/Kona Street
21. Pensacola Street/Waimanu Street
22. Kamakee Street/Queen Street
23. Kamakee Street/Auahi Street
24. Auahi Street/Pedestrian Crossing (Ward Entertainment Center)
25. Auahi Street/Pedestrian Crossing (Ward Warehouse/Farmers Market)

26. South Street/Pohukaina Street
27. South Street/Halekauwila Street
28. South Street/Queen Street
29. Queen Street/Emily Street
30. Queen Street/Cooke Street
31. Halekauwila Street/Cooke Street
32. Pohukaina Street/Cooke Street
33. Auahi Street/Cooke Street
34. Ilalo Street/Cooke Street
35. Ilalo Street/Keawe Street
36. Ilalo Street/Ahui Street
37. Ala Moana Boulevard/Ahui Street
38. Ala Moana Boulevard/Koula Street
39. Ala Moana Boulevard/Ohe Street
40. Ilalo Street/Koula Street
41. Ilalo Street/Ohe Street
42. Ahui Street/Olomehani Street
43. Ohe Street/Olomehani Street
44. Ala Moana Boulevard/Alakea Street
45. Ala Moana Boulevard/Bishop Street
46. Ala Moana Boulevard/Fort Street
47. King Street/Alakea Street
48. King Street / Bishop Street

Figure 10 Study Intersection Map

Existing Traffic Volumes

Peak-period intersection volume counts[vi] were conducted during the week of January 15, 2013 at each study intersection:

- Travel counts included motor vehicle movements and pedestrian crossings at each study intersection. Count sheets from each location are provided in Appendix A.
- Morning counts were conducted from 7:00 AM to 9:00 AM. Afternoon counts were conducted from 4:00 to 6:00 PM. Based on those 2-hour counts: the "peak hour" was determined at each study intersection based on the highest consecutive 60-minute volume.

Peak-hour motor vehicle volumes at each study intersection are shown on Figures 11 to 13.

Figure 11 Existing Peak Hour Motor Vehicle Volumes

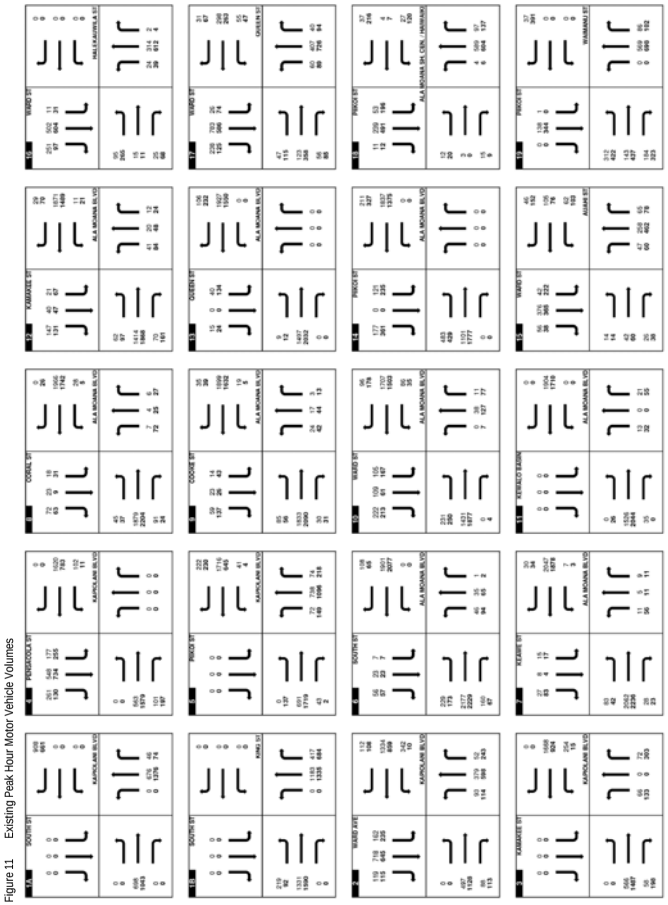


Figure 12 Existing Peak Hour Motor Vehicle Volumes

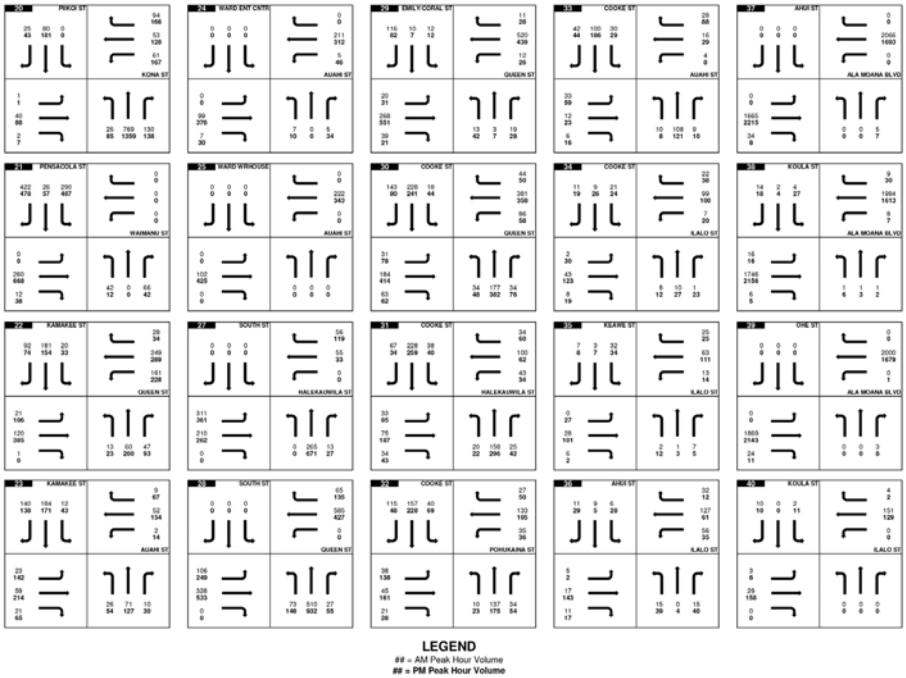
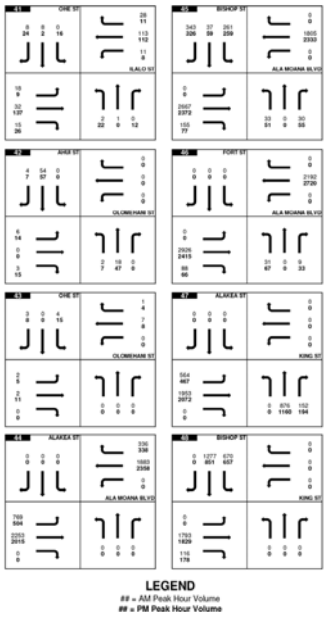


Figure 13 Existing Peak Hour Motor Vehicle Volumes



Existing Traffic Operations

Traffic operations are typically evaluated based on Level of Service (LOS) standards described in the Highway Capacity Manual (HCM). LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, which represents free flowing operating conditions, to LOS F, which represents the most congested conditions. LOS E represents "at-capacity" operations. When traffic volumes exceed the capacity, stop-and-go conditions result, and operations are designated as LOS F.

Table 7 summarizes the LOS definitions for each rating (A though F) for both signalized and stop-sign controlled intersections.

A key distinction when determining LOS pertains to the assessment of side-street stop-signed controlled intersections:

- At signalized intersections, and at "all-way stop-sign controlled intersections", the methodology for calculating LOS is based on average motor vehicle delay for all approaches.
- The LOS methodology differs slightly for side-street stop-sign controlled intersections. For these intersections, LOS is based on average delay to the side-street (approaching the stop-sign). This study includes several side-street stop-sign controlled intersections, including the stop-sign controlled to Ala Moana Boulevard at Ahui Street and Kaula Street.

Operational observations and field assessments were conducted to calibrate the traffic operations analysis methodology. Traffic signal-timing plans were provided for use in the analysis. Analysis of traffic operations and corridor travel time was conducted utilizing SYNCHRO 8 analysis software and SimTraffic microsimulation. Travel-time by automobile was field-checked based on multiple runs via automobile during the AM and PM Peak Hours. Existing travel speeds are presented in Table 6.

Table 6 Estimated Net Travel Speeds - Existing

Street	Direction	AM Peak Hour	PM Peak Hour
Ala Moana	Eastbound (Piikoi to Fort)	14 mph	10 mph
	Westbound (Fort to Piikoi)	10 mph	14 mph
Queen	Eastbound (South St to Kamakee)	16 mph	15 mph
	Westbound (Kamakee to South St)	14 mph	12 mph
Ward	Northbound (Ala Moana to Kapiolani)	11 mph	10 mph
	Southbound (Kapiolani to Ala Moana)	14 mph	14 mph

Table 7 Intersection Level of Service Definitions

LOS	Flow Type	Operational Characteristics	Intersection Control Delay (seconds/vehicle)	
			Signal Control	2-Way-Stop or All-Way Stop Control
A	Stable Flow	Free-flow conditions with negligible to minimal delays. Excellent progression with most vehicles arriving during the green phase and not having to stop at all. Nearly all drivers find freedom of operation.	< 10	0 – 10
B	Stable Flow	Good progression with slight delays. Short cycle-lengths typical. Relatively more vehicles stop than under LOS A. Vehicle platoons are formed. Drivers begin to feel somewhat restricted within groups of vehicles.	> 10 – 20	> 10 – 15
C	Stable Flow	Relatively higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant, although many still pass through without stopping. Most drivers feel somewhat restricted.	> 20 – 35	> 15 – 25
D	Approaching Unstable Flow	Somewhat congested conditions. Longer but tolerable delays may result from unfavorable progression, long cycle lengths, and/or high volume-to-capacity ratios. Many vehicles are stopped. Individual cycle failures may be noticeable. Drivers feel restricted during short periods due to temporary back-ups.	> 35 – 55	> 25 – 35
E	Unstable Flow	Congested conditions. Significant delays result from poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures occur frequently. There are typically long queues of vehicles waiting upstream of the intersection. Driver maneuverability is very restricted.	> 55 – 80	> 35 – 50
F	Forced Flow	Jammed or grid-lock type operating conditions. Generally considered to be unacceptable for most drivers. Zero or very poor progression, with over-saturation or high volume-to-capacity ratios. Several individual cycle failures occur. Queue spillovers from other locations restrict or prevent movement.	> 80	> 50

Source: Highway Capacity Manual (HCM) 2010

Table 8 summarizes Existing AM & PM Peak Hour LOS at each study intersection, based on the Existing Conditions analysis steps described above. As shown:

- The following intersections operate at LOS E during the AM or PM Peak Hour, indicating congested conditions:

- Ala Moana & South/Forest
- Ala Moana & Ward
- Bishop & King

- During the peak periods, the peak-direction traffic flow in the "peak direction" (westbound AM, eastbound PM) results in queues that affect downstream intersections. Lengthy signal cycle lengths on the major east/west arterial corridors contribute added delay to motorists, pedestrians and cyclists, during peak as well as off-peak hours. The east/west cycles vary from 100 to 140 seconds. Such cycles are much longer in duration than found in most central-city or downtown areas, and may conflict with goals aiming at creating a walkable, multi-modal environment.

Table 8 Peak Hour Intersection Level of Service (Existing Conditions)

Intersection Number	Street Names	Control Type	AM LOS (Delay)	PM LOS (Delay)
1a	South at Kapiolani	Signalized	B (19)	C (24)
1b	King at Alapai	Signalized	C (24)	C (21)
2	Ward at Kapiolani	Signalized	D (46)	D (39)
3	Kamakee at Kapiolani	Signalized	A (<10)	C (24)
4	Pensacola at Kapiolani	Signalized	B (19)	C (20)
5	Piikoi at Kapiolani	Signalized	B (18)	C (26)
6	South/Forest at Ala Moana	Signalized	E (58)	E (71)
7	Keawe at Ala Moana	Signalized	*D (<55)	*C (<35)
8	Coral at Ala Moana	Signalized	*C (<35)	*C (<35)
9	Cooke at Ala Moana	Signalized	D (41)	*D (<55)
10	Ward at Ala Moana	Signalized	E (59)	E (57)
11	Kewalo Basin at Ala Moana	TWSC	B (11)	A (<10)
12	Kamakee at Ala Moana	Signalized	A (<10)	B (13)
13	Queen at Ala Moana	Signalized	B (15)	B (14)
14	Piikoi at Ala Moana	Signalized	C (26)	C (23)
15	Ward at Auahi	Signalized	B (12)	B (13)
16	Ward at Halakauwila	Signalized	A (<10)	B (15)
17	Ward at Queen	Signalized	B (19)	C (31)
18	Piikoi at Shopping Center	Signalized	A (<10)	B (15)
19	Piikoi at Waimanu	Signalized	B (17)	B (18)
20	Piikoi at Kona	Signalized	A (<10)	B (12)
21	Pensacola at Waimanu	Signalized	D (43)	C (34)
22	Queen at Kamakee	Signalized	C (30)	C (34)

Intersection Number	Street Names	Control Type	AM LOS (Delay)	PM LOS (Delay)
23	Kamakee at Auahi	Signalized	B (17)	C (31)
24	Ward Entertainment Center driveway at Auahi	Signalized	A (<10)	A (<10)
25	Ward Warehouse driveway at Auahi	Signalized	A (<10)	A (<10)
26	South at Pohukaina	Signalized	B (19)	C (20)
27	South at Halakauwila	Signalized	B (16)	C (21)
28	Queen at South	Signalized	B (16)	B (20)
29	Coral/Emily at Queen	Signalized	B (11)	A (<10)
30	Cooke at Queen	Signalized	B (19)	C (22)
31	Cooke at Halakauwila	AWSC	B (11)	B (16)
32	Cooke at Pohukaina	AWSC	A (<10)	C (14)
33	Auahi at Cooke	TWSC	B (11)	B (13)
34	Cooke at Ilalo	TWSC	B (11)	A (<10)
35	Keawe at Ilalo	TWSC	A (<10)	B (14)
36	Ahui at Ilalo/Ward	AWSC	A (<10)	A (<10)
37	Ahui at Ala Moana	TWSC	A (<10)	A (<10)
38	Koula at Ala Moana	Signalized	*C (<35)	*D (<55)
39	Ohe at Ala Moana	TWSC	B (15)	C (17)
40	Ilaho at Koula	TWSC	A (<10)	A (<10)
41	Ohe at Ilalo	TWSC	B (11)	B (11)
42	Ahui at Olomehani	TWSC	A (<10)	A (<10)
43	Driveway/Ohe at Olomehani	TWSC	A (<10)	A (<10)
44	Ala Moana at Alakea	Signalized	B (16)	B (15)
45	Bishop at Ala Moana	Signalized	C (21)	C (33)
46	Fort at Ala Moana	Signalized	A (<10)	A (<10)
47	Alakea at King	Signalized	C (24)	B (19)
48	Bishop at King	Signalized	C (25)	D (36)

* Reflects estimate of additional delay due to downstream capacity constraints.

2.4 PUBLIC TRANSIT

Existing Transit Service

The City and County of Honolulu is served by The Bus, one of the most highly used public bus systems of any city in the nation on a per capita basis. TheBus is operated by Oahu Transit Services (OTS) and provides fixed-route public transit and paratransit service in the Mauka Area, Honolulu, and throughout the island of O`ahu. TheBus operates a "hub-and-spoke" network, with the majority of services centralized along major corridors and serving major destinations. Within the Mauka Area, most lines run along major corridors such as King Street, Kapiolani Boulevard, and Ala Moana Boulevard. Existing transit service in the Mauka Area in the AM and PM peak periods is summarized in Table 9 below and is mapped in Figure 14.

Major trunk lines such as the 1 / 1L and 2 / 13 provide high-frequency service all day, with the remainder operating at lower and sometimes irregular frequencies. Feeder lines connect various neighborhoods within Honolulu to major destinations or transfer points. Peak express buses run a limited number of runs in the peak period in the peak direction, connecting various parts of O`ahu with Downtown Honolulu and the Mauka Area. TheBus also operates four rapid bus lines through the Mauka Area: CityExpress A, CityExpress B, CountryExpress C, and CountryExpress E. TheBus service is complemented by ferry service operated as TheBoat, which runs between the Aloha Tower in Downtown and Kalaeloa on the west side of Oahu. Connecting bus services operate as "F-series" lines at both ferry terminals.

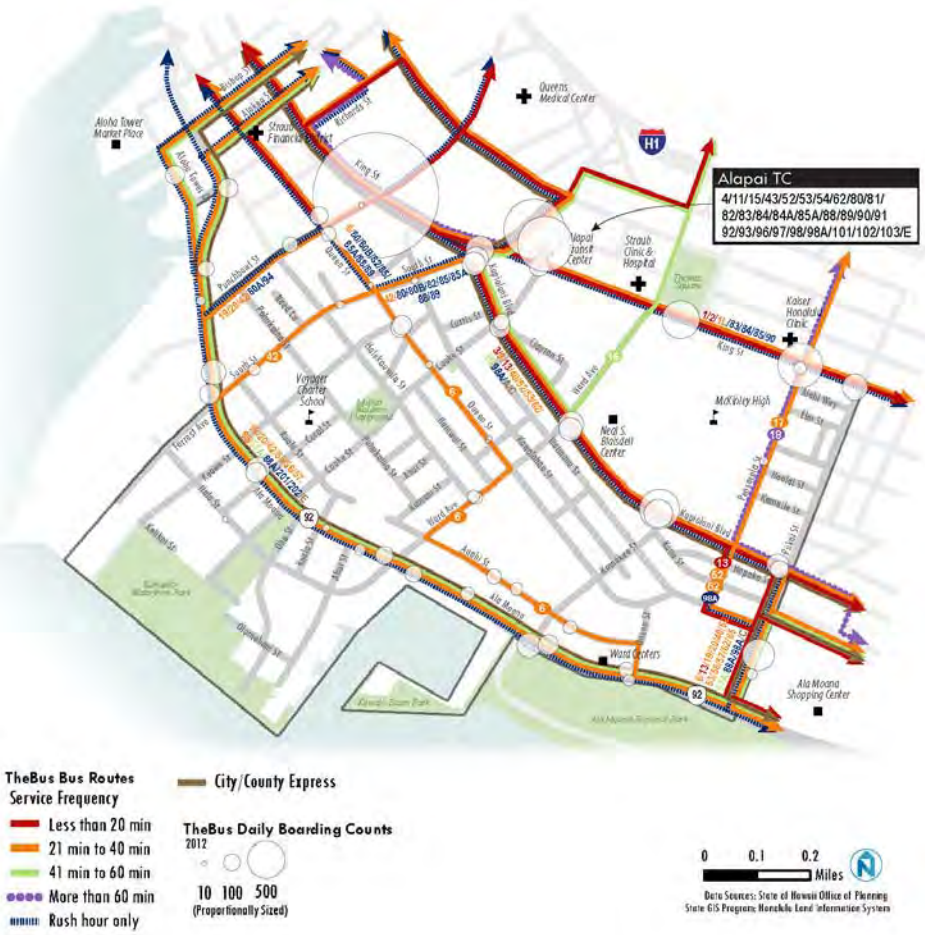
Table 9 Existing Transit Routes & Frequency

Line	Route	Screenline	Service Frequency (minutes)			
			Eastbound		Westbound	
			AM	PM	AM	PM
Trunk Lines						
1	Kalihi / Aala Park to Hawaii Kai	East, West	10	10	10	10
1L	Kalihi / Aala Park to Hawaii Kai	East, West	30	30	30	30
2	Kalihi and Liliha to Waikiki	East, West	5-15	5-10	15	10-15
3	Salt Lake to Kaimuki	East, West	10-15	15-30	15	10-15
6	Pauoa to University/Woodlawn	East, West	20	20	20	20-30
8	Ala Moana Center to Waikiki	East	20-30	5-15	5-20	10-20
9	Pearl Harbor to Palolo Valley	East, West	15-25	10-20	15-20	10-20
13	Liliha to Campbell Ave	East, West	10-15	15	15-20	15
19	Hickam AFB/HNL Airport to Waikiki	East, West	30+	20-40	30-50	30-50
20	Pearlridge to Waikiki	East, West	30-40	40	40	40
23	Ala Moana/Waikiki to Sea Life Park	East	20-30	35-55	20-60	35-50
40	Makaha to Honolulu	West	30	10-30	25-30	15-40
42	Waikiki to Ewa Beach	East, West	30	30	25	35-40
43	Waipahu Street to Ala Moana Center	West	30	30	30	30
52	Honolulu to North Shore	West	20	15	15	15
53	Pacific Palisades to Honolulu	West	20-30	45	30-40	20-45
54	Pearl City to Alapai Transit Center	West	20-30	10-25	30	10-20
55	Ala Moana to Kaneohe-Kahaluu	West	40	40-50	30-45	45-60
56	Kaneohe/Kailua to Honolulu	West	45	30-50	60	20-35
57	Ala Moana to Sea Life Park	West	30-60	30	45-55	30
57A	Kailua to Ala Moana Center	West	15-40	60	60	65
62	Wahiawa Heights to Honolulu	West	20-30	15-25	15	15-30
65	Honolulu to Kahaluu	West		30	30	30-40
Feeder Lines						
15	Pacific Heights to Honolulu	North	15-45	30	15-60	10-20
17	Maikiki to Ala Moana	North	35-45	15-20	40	20-40
18	Ala Moana Center to UH	North	60-70	60	75	60

Line	Route	Screenline	Service Frequency (minutes)			
			Eastbound		Westbound	
			AM	PM	AM	PM
Peak Express Service						
80	Hawaii Kai to Downtown	East		20	20	
80A	Hawaii Kai to Downtown/UH	East		40-50	40-60	
82	Kalama Valley to Downtown	West		45		
83	Wahiawa to Downtown	West	15-20			10-30
84	Mililani to Downtown/UH	West	30			30
84A	Mililani Express to Downtown UH	West	30			30
85	Kailua/Kaneohe to Downtown/UH	West	15			30
85A	Kaneohe to Downtown/UH	West	15-30			30
88	Kahaluu to Downtown	West	25			30-45
88A	Honolulu to North Shore	West		30		40
89	Waimanalo to Downtown	West	40			40
90	Pearl City to Downtown	West	30			30
98	Mililani Park to Downtown/Waikiki	West				30-40
98A	Kunia to Downtown/Waikiki	West				40
W1	Waipahu/Ewa Beach to Waikiki	West	10-15			20
W2	Waipahu to Waikiki	West	20			15
Rapid Bus Lines						
A	Waipahu to UH	East, West	15	15-20	15	15
C	Makaha to Honolulu	West	30	30	30	30
E	Ewa Beach to Waikiki	East, West	30	30	30	30

Source: TheBus (2013)

Figure 14 Existing Transit Service Map



Existing Transit Ridership & Capacity

A screenline analysis was used to evaluate transit operations. A screenline is a theoretical grouping of transit lines that serve an identifiable corridor or area, chosen such that it passes these lines either at or near their maximum load point (MLP). The MLP is defined as the point along a particular route at which passenger loading on the transit vehicle is the highest. For example, for a peak express line that serves Downtown Honolulu, the MLP could be considered the point at which the bus leaves Downtown and enters the freeway, as the bus is most crowded after all the passengers who will ride have boarded. After it exits the freeway and passengers begin alighting, the bus only gets less and less crowded.

Once the relevant transit lines are grouped into screenlines, the ridership and capacity for each screenline are combined to obtain a capacity utilization ratio—the ratio of ridership to capacity. A screenline operating at a high capacity utilization indicates that transit vehicles operating on lines grouped in that screenline generally operate with high loads relative to vehicle capacity. For the purpose of this study, a capacity utilization of more than 80 percent is considered a "high load" and would require mitigations.

To obtain screenline ridership and capacity, the ridership and capacity for each individual screenline are summed together. For the purposes of this study, ridership information and capacity numbers are taken from the 2009 EIS. Capacity in the 2009 EIS was calculated based on vehicle size and capacity (both seated passengers and standees) and line frequency.

The screenline analysis assumes that the AM peak direction travels into the Mauka Area in the and out of the Mauka Area in the PM peak period. **Error! Reference source not found.** provides an overview of ridership, capacity, capacity utilization across the screenlines in the AM and PM peak directions. Figure 15 and Figure 16 illustrate this analysis graphically.

Table 10 Existing Transit Capacity Utilization

Screenline	Existing Conditions		
	Ridership	Capacity	Capacity Utilization
AM Beak Hour - Inbound			
East	4,635	10,500	44%
West	2,943	6,720	44%
North	351	480	73%
Total	7,929	17,700	45%
PM Peak Hour - Outbound			
East	2,915	6,300	46%
West	4,645	10,590	44%
North	440	660	67%
Total	8,000	17,550	46%

Source: Kaka`ako Mauka Area Plan Supplemental Environmental Impact Statement Transportation Analysis, April 14, 2009.

Figure 15 Existing Transit Capacity Utilization AM Peak Hour

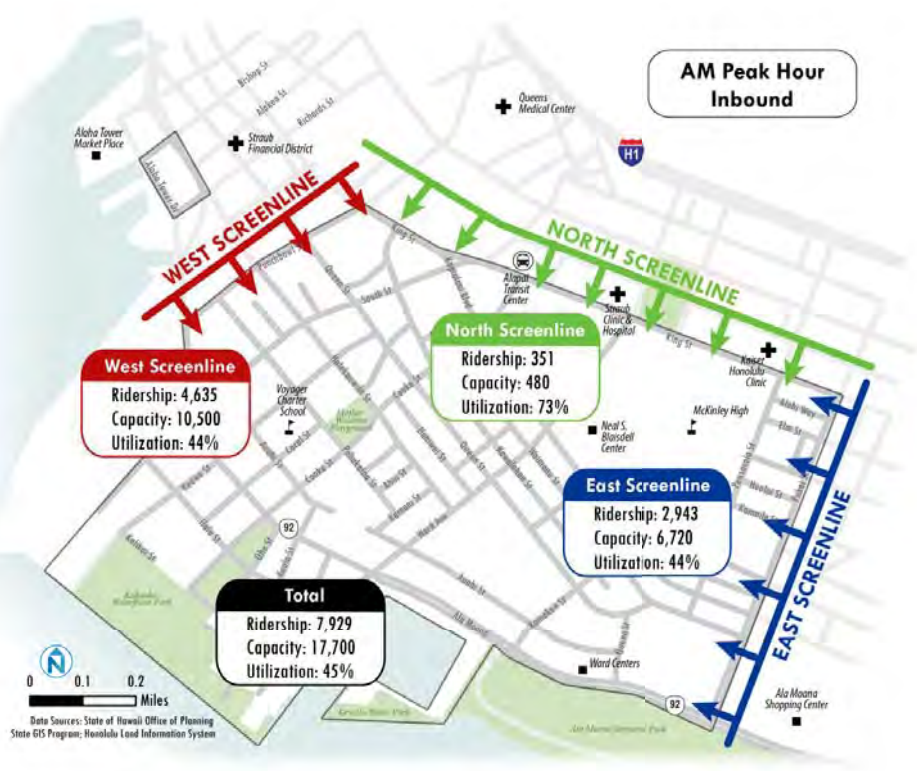
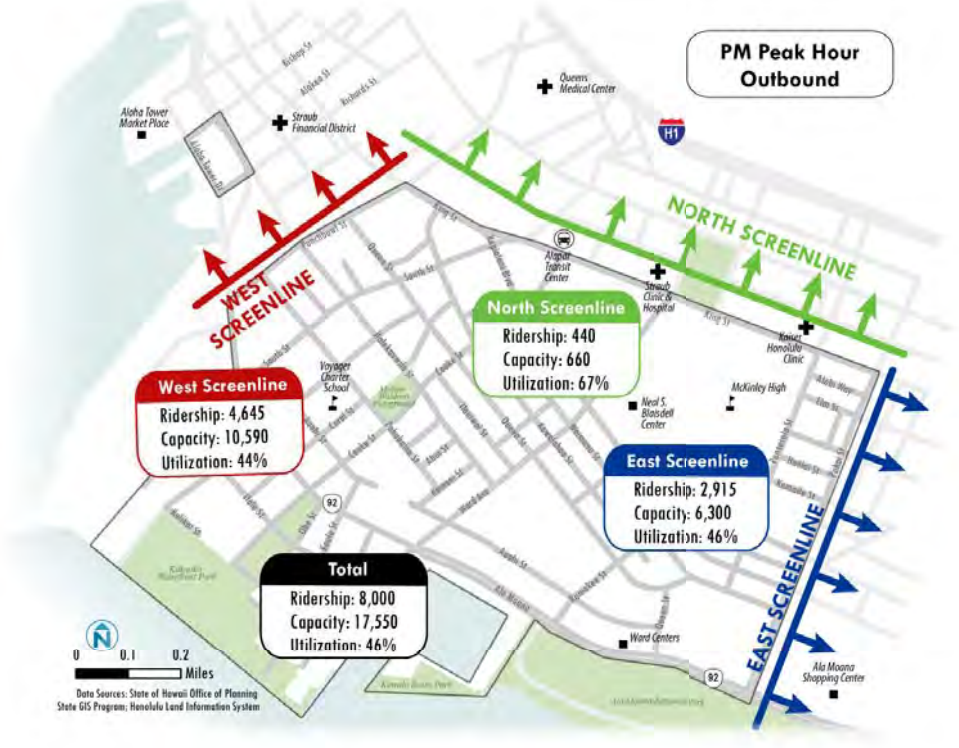


Figure 16 Existing Transit Capacity Utilization PM Peak Hour



2.5 BICYCLE CIRCULATION

Existing Bicycle Routes

Bicyclists traveling to and through the Kaka`ako Community Development District generally must share travel lanes with automobiles to access destinations because there are limited designated bicycle facilities. The Aloha Tower Special District is not served by existing bicycle facilities. The most direct routes for bicycle travel—including King Street, Kapiolani Boulevard, and Ala Moana Boulevard—are not popular or comfortable cycling routes due to heavy vehicle volumes, high off-peak travel speeds, and the absence of dedicated bicycle facilities. As shown in Figure 17, there are only three short bikeway segments within the project area, including:

- **Kaka`ako Waterfront Park multi-use path:** A bicycle and pedestrian only path facility (Class I) that provides fully separate from the nearest parallel roadway (Ala Moana Boulevard). The path runs from Kakaako Waterfront Park in the Makai Area east through Kewalo Basin and Ala Moana Park. Travel to and from neighborhoods and destinations Diamond Head of the project area can be made by bicycle on this facility; however, a variety of gaps make this connection challenging and exposes cyclists to various conflicts with turning automobiles.
- **Keawe Street southbound bike lane:** This one-way dedicated striped and signed bicycle facility (Class II) spans from Ilalo Street southbound to the Keawe Street end at Kaka`ako Waterfront Park. The bike lane is proximate, but does not connect with the Kaka`ako Waterfront Park multi-use path due to a chain link fence barrier. This is the only existing bike lane in the project area.
- **Queen Street/Waimanu Street bike route:** This unmarked partially signed bicycle route (Class III) connects cyclists from Kamakee Street to Piikoi Street. This facility is overlaid on a 4-lane configuration (two lanes in each direction from Pensacola Street to Kamakee Street; four lanes in one direction from Pensacola Street to Piikoi Street). No pavement markings—like shared lane markings (also known as sharrows)—are provided for safe riding location or wayfinding. The only signage indicating the bicycle route designation is provided on the Waimanu Street segment from Pensacola Street to Piikoi Street.

Other designated facilities in the vicinity of the project area that provide access to Kaka`ako include:

- Ala Moana Regional Park multi-use path—a Class I bicycle facility connecting cyclists to Ala Moana Center and Waikiki.
- Young Street bike lane and bike route—a key east-west bicycle street with a mixture of Class II and III facilities connecting bicyclists between the Kaka`ako and McCully-Mo`ili`ili neighborhoods.
- Capital Historic District/Alapai Transit Center multi-use path linkage—a Class I bicycle facility from Kealamakai Street to Richards Street connecting cyclists to the Alapai Transit Center, the Hawai`i Capital Historic District, and Downtown.
- Hotel Street bike route—a shared bus and bike only street from Richards Street to River Street at the edge of Downtown Honolulu.

In addition, several low speed, low volume internal streets provide relatively comfortable and direct shared roadway bicycle connections *within* the project area. This includes Ilalo Street, Keawe Street, Pohukaina Street, Waimanu Street, and Kawaiahao Street. Although these streets provide comfortable shared roadway operating environment for bicycles, nearly all of the connections are bookended by a major arterial crossing barrier, a street end (i.e., cul-de-sac), or off-set intersection that requires travel on a short high speed, high volume segment. It should be noted that only one viable north-south shared roadway connection is available (Cooke Street), which requires bicycles entering or exiting the district to use one of the higher speed and volume streets.

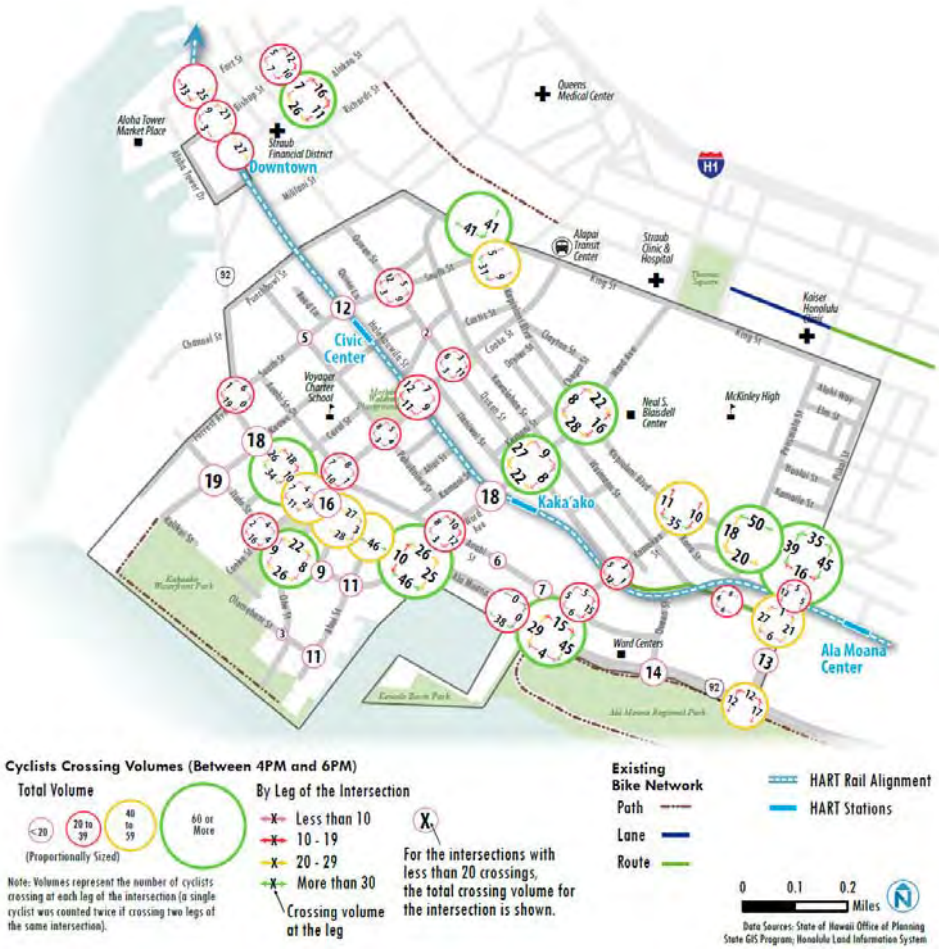
Existing Bicycle Volumes

As part of the transportation analysis, bicycle counts were collected in the PM peak travel period. The most heavily travelled bicycle corridors during PM peak includes Kapiolani Boulevard (up to 70 east-west crossings), Ala Moana Boulevard (up to 72 east-west crossings), Piikoi Street (up to north-south 84 crossings), Kamakee Avenue (up to 74 north-south crossings), and Ward Avenue (up to 35 north-south crossings). While bicycle travel along high traffic corridors and freeway access routes for automobiles is not preferred by most bicyclists, there are limited routing options for cyclists that seek direct travel and limited delay at unsignalized crossings.

Bicyclists observed during the bicycle count typically used the right-most travel lane adjacent to curbside parking (or adjacent to the curb where parking is not permitted), or rode on the sidewalks.

Figure 17 Existing Bicycle Network

Figure 18 Existing Bicycle Volumes at Intersections



2.6 PEDESTRIAN CIRCULATION

Existing Pedestrian Facilities

Current pedestrian conditions of the proposed project area are described in this section. Existing pedestrian conditions vary in quality and facility availability (sidewalks, crossings, amenities, etc.). Many streets in Central Kaka`ako, including Queen Street and Waimanu Street, exhibit curbless industrial character. These streets lack curbs and sidewalks, forcing pedestrians to walk in the street without the necessary design features to ensure pedestrian comfort and safety. Other streets, like those bounding the Ward Centers, are highly oriented towards pedestrians.

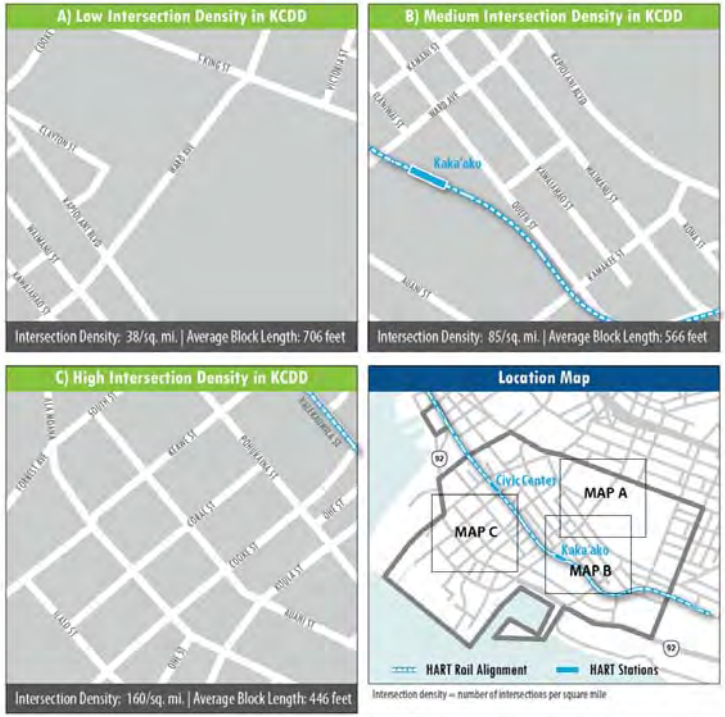
This variance is due, in part, to the diversity of land uses in the project area (particularly the industrial land use character in Central Kaka`ako) and the relative level of pedestrian orientation along and across each street. Pedestrian orientation is based on a variety of factors, including, but not limited to, sidewalk coverage and width, pedestrian-supportive amenities (e.g., shade tree canopy, benches, landscaping, etc.), walk distances, availability of marked crossings and short crossing distances, pedestrian delay acceptable for urban conditions, and traffic conditions (distance from adjacent traffic, traffic speed and volumes, etc). Only a few streets in Kaka`ako have the qualities typical of a highly pedestrian oriented environment: these pedestrian-friendly streets include portions of Ilalo Street, Kapiolani Boulevard, Ward Avenue (immediately makai of Ala Moana Boulevard), Auahi Street, Kamakee Street, and Piikoi Street. In summary, pedestrian facilities in Kaka`ako can be characterized as follows:

- **Street Frontages.** Activating street frontages with pedestrian-oriented land uses and inviting pedestrian and bicycle environments helps to encourage walking to work, retail, and other commercial destinations. These active environments can be found in small pockets of Auahi Street and Cooke Street. Without the appropriate zoning regulations to ensure active street environments, very large retail establishments (100,000 square feet or larger) like Ward Centers and Ala Moana Center are typically antithetical to this pedestrian orientation factor.
- **Sidewalk coverage and width.** For the purposes of this study, existing sidewalk in the Mauka Area is defined as either obstructed (effective width less than 4' feet) or unobstructed (effective width greater than or equal to 4'). Sidewalk widths in the project area range between spacious (Kapiolani = 17') and very constrained (makai side of Ala Moana = 3-4'). Most commercial streets (e.g., Cooke, Ward, Pensacola) have 10-foot sidewalks to support pedestrian activity, while many residential serving streets offer 4-6' sidewalks. As illustrated in Figure 19, most streets outside of Central Kaka`ako and the Makai area have sidewalks on both sides of the street. The industrial character of many internal streets require pedestrians to share space with cars and parking storage. Some streets like Ala Moana Boulevard and King Street have obstructions like utilities, landscaping, and transit facilities that may impact people using mobility devices.
- **Pedestrian-supportive amenities.** Some streets provide generous pedestrian amenities like shade trees, benches, landscaped buffers, and planters that enhance the pedestrian experience and attract pedestrians. Kapiolani Boulevard, Ilalo Street, and parts of Auahi Street, Waimanu Street and Piikoi Street are model examples of high amenity streets.

Figure 19 Existing Sidewalk Network

- **Block sizes and walking distances.** Block size, which defines intersection density, is an enormously important factor that influences the accessibility and walkability of an area. Smaller block sizes decrease walking distances and, coupled with good urban design, tend to increase walkability and improve the pedestrian experience. Limited mid-block crossing opportunities either require longer walking distances to destinations (depending on routing and trip origin), or could encourage risky walking behavior, such as jaywalking and ignoring traffic control devices. Providing throughways or internal accessways within a larger development site breaks up the massive scale of large blocks and improves circulation through and around the site. This feature is only available in a few locations.

Figure 20 Existing Block Length Examples



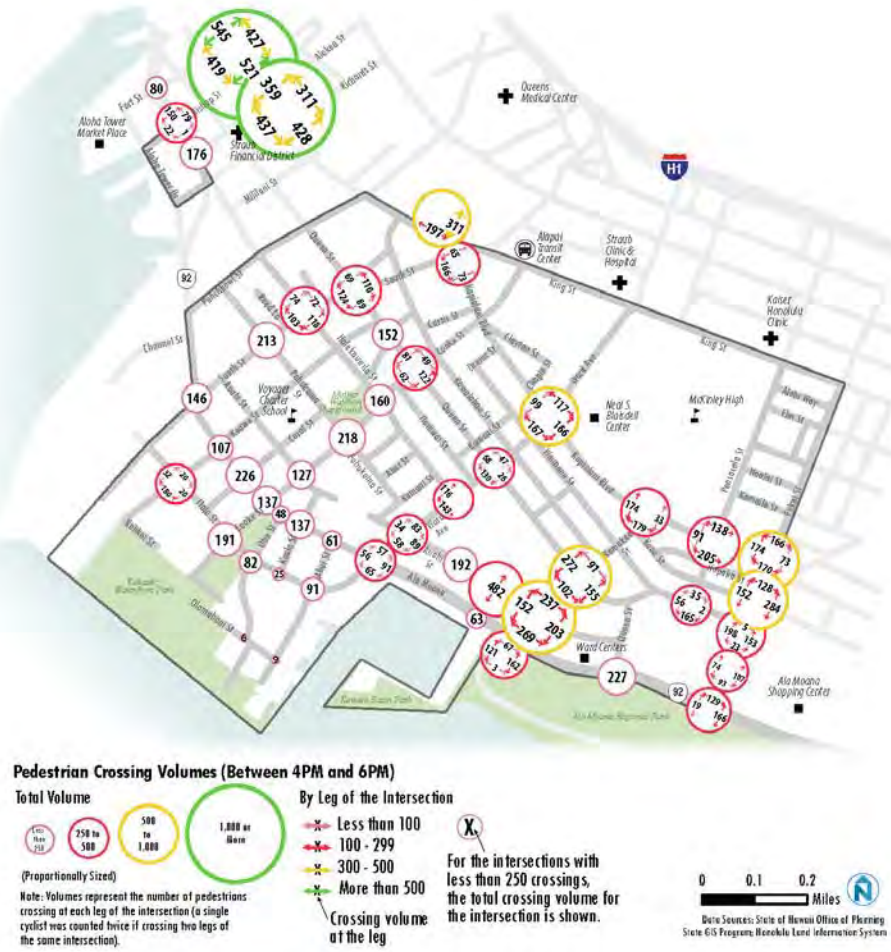
Note: The following analysis only calculates intersection density for full street connections, not pedestrian and service alleys.

- **Crossings.** There are limited marked crossings throughout the project area. Most marked crossings are striped at signalized intersections, most of which are marked on all four legs. There are a variety of crossing conditions that create long crossing distances for pedestrians including wide arterial curb-to-curb widths (4 lanes and over), skewed intersections (see the King/Kapiolani and Ala Moana/Ward intersections), intersection legs closed to pedestrians, large curb radii at intersection corners, and a general lack of curb extensions. Many of these conditions are prevalent throughout the project area.
- **Pedestrian delay.** Pedestrians experience long delays while crossing some arterials. In highly urbanized areas, pedestrian delay ranging from 70-80 second cycles is generally viewed as acceptable. Pedestrians crossing (north-south) at Ala Moana Boulevard commonly experience 140 second cycles, while street pushes through AM and PM peak auto volumes.

Pedestrian Volumes

Figure 21 displays PM peak period pedestrian crossings throughout the project area. Pedestrian traffic is low in much of the project area, particularly compared to Downtown or Waikiki; many more people travel on foot on the western edge of the district adjacent to downtown and the government office areas. The highest level of pedestrian activity occurs near major transit stops on Ward Avenue and Kapiolani Boulevard and in areas where there are higher concentrations of retail and services. Bishop Street, Richards Street, Kamakee Street, Piikoi Street, Ward Avenue, and Kapiolani Boulevard are corridors that produce the highest number of PM peak period crossings in the project area.

Figure 21 Existing Pedestrian Crossing Volumes at Intersections (2-hour PM Peak)



FUTURE BASELINE CONDITION

This section describes conditions under the Future Baseline Condition. It describes Forecast Year 2035 trip generation and travel mode choice patterns, as well as motor vehicle, public transit, bicycle and pedestrian circulation conditions for this alternative. .

3.1 TRIP GENERATION & TRAVEL MODES

Travel Demand Forecast – Year 2035 Baseline (Future Baseline Condition)

The OMPO model was utilized to provide a forecast of trip generation based on Future Baseline Condition (Year 2035 Baseline) land uses. The net change to trip generation was derived based on existing land uses under the OMPO Model Year 2015 Baseline scenario. Table 11 provides a summary of the travel demand forecast. As shown:

- Total trips by all modes to, from, and within the study area will approximately double as a result of expected development under the Future Baseline Condition.
- Rates of walking and bicycling – as a portion of total trips – will increase from 15 to 20 percent, while rates of driving – as a portion of total trips – will decrease from 77 to 71 percent.
- The portion of daily trips internal to the study area will increase from approximately one-third to over one-half of daily trips.

Table 11 Future Baseline Condition – Travel Mode Comparison (Year 2035)

	Existing Conditions (Model Base Year)	Future Baseline Condition (Model Year 2035 Baseline)
Households	11,867	38,221
Retail Employment	7,916	16,840
Non-Retail Employment	28,303	44,739
Daily Trips (all modes)	286,878	569,295
Transit Mode Share	7.2%	8.7%
Walk + Bike Mode Share	15.5%	20.1%
Automobile Mode Share	77.3%	71.3%
Internal Capture (portion of daily trips with origins & destinations within the study area)	36.7%	51.3%

Trip Generation – Year 2035 Baseline (Future Baseline Condition)

Table 12 provides a comparison of motor vehicle, transit and walk/bike trips generated by land uses within the Plan Area, based on the regional model, under Existing and Year 2035 Future Baseline conditions. As shown:

- Motor vehicle trips will increase by approximately 80 percent over existing conditions – from approximately 185,000 daily under Existing Conditions to approximately 338,000 daily in Year 2035 under the Future Baseline Condition.
- Transit trips will more than double – from approximately 20,000 daily transit trips under Existing Conditions, to nearly 50,000 daily trips to/from the study area in Year 2035.
- Bicycle and walking trips will nearly triple – from approximately 44,000 under Existing Conditions to over 114,000 in Year 2035.

Table 12 Future Baseline Condition – Trip Generation Comparison (Year 2035)

	Vehicle Trips			Transit Trips	Walk/Bike Trips
	AM Peak Hour	PM Peak Hour	Daily	Daily	Daily
Existing Conditions	13,822	9,249	184,797	20,655	44,466
Year 2035 Baseline (Future Baseline Condition)	25,380	28,313	338,256	49,528	114,428
Net Trip Generation (Future Baseline Condition)	*11,558*	*19,064*	*153,459*	*28,873*	*69,962*

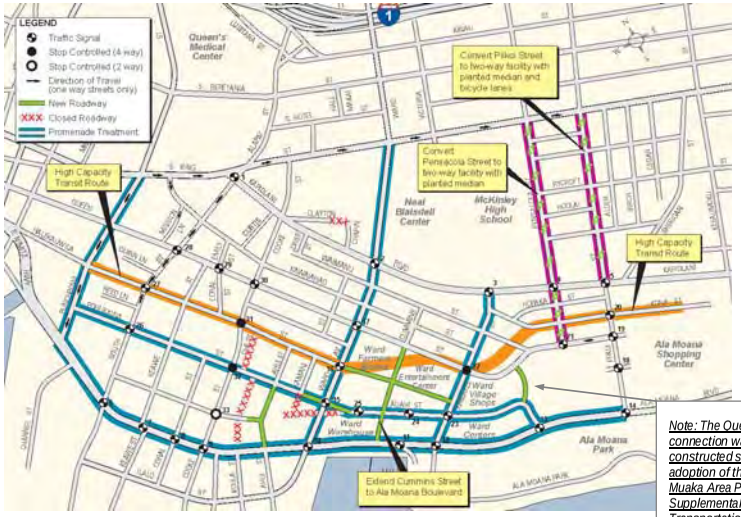
3.2 FUTURE BASELINE ROADWAY NETWORK

Analysis of the Future Baseline Condition is based on an assumed future roadway network, this network includes some *but not all* of the roadway network changes that were analyzed as part of the 2009 SEIS (displayed in Figure 22). Figures 23-27 illustrate the changes to key roadways that are anticipated under the Future Baseline Condition. They are as follows:

- Widening of Ala Moana Boulevard from 72 feet (under Existing Conditions) to 84 feet (under Year 2035 conditions), in order to provide additional left-turn capacity.
- Restriping of Ward Avenue to modify lane widths (but with no change to number of lanes or curb-to-curb width).
- The proposed 2-way conversion of Piikoi and Pensacola (as shown on Figure 24) is not included in the Future Baseline, based on the 2009 SEIS that identified a significant cumulative traffic impact resulting from the proposed conversion. As a result, the recommended mitigation, as described in the 2009 SEIS, was to maintain two-way operation on Piikoi and Pensacola.

- As shown on Figures 25 to 27: no other changes to key roadways are anticipated under the Future Baseline Condition.

Figure 22 Planned / Proposed Roadway Network Changes (Future Baseline Condition)

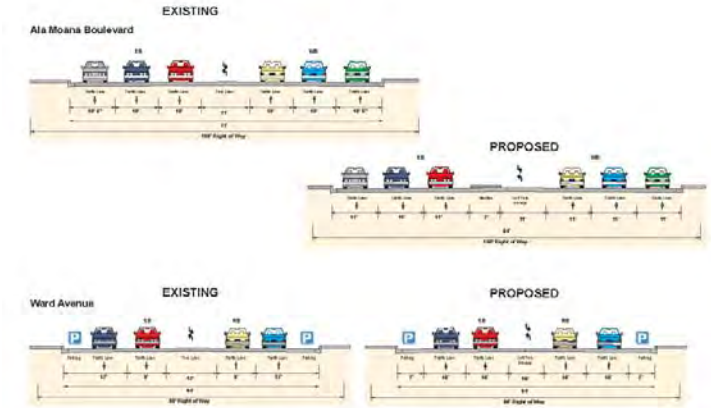


Note: The Queen Street connection was constructed since the adoption of the Kaka`ako Muaka Area Plan Supplemental EIS Transportation Analysis.

Source: Kaka`ako Muaka Area Plan Supplemental EIS Transportation Analysis, April 14, 2009.

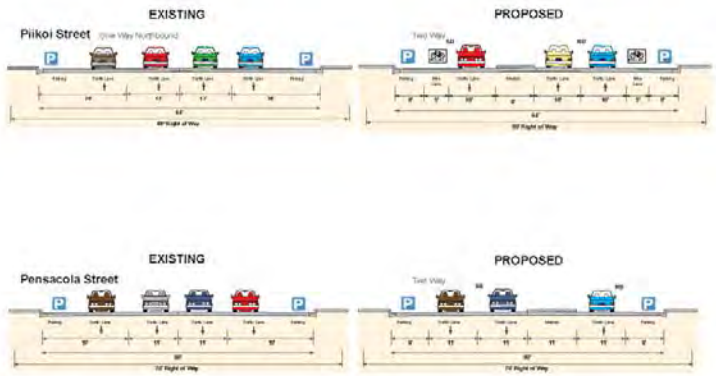
The proposed Piikoi/Pensacola two-way conversion is not included in the Future Baseline Condition analysis, based on the mitigations described in the 2009 Kaka`ako Muaka Plan SEIS.

Figure 23 Planned Roadway Network Changes (Future Baseline Condition)



Source: Kaka`ako Mauka Area Plan SEIS Transportation Analysis, April 14, 2009

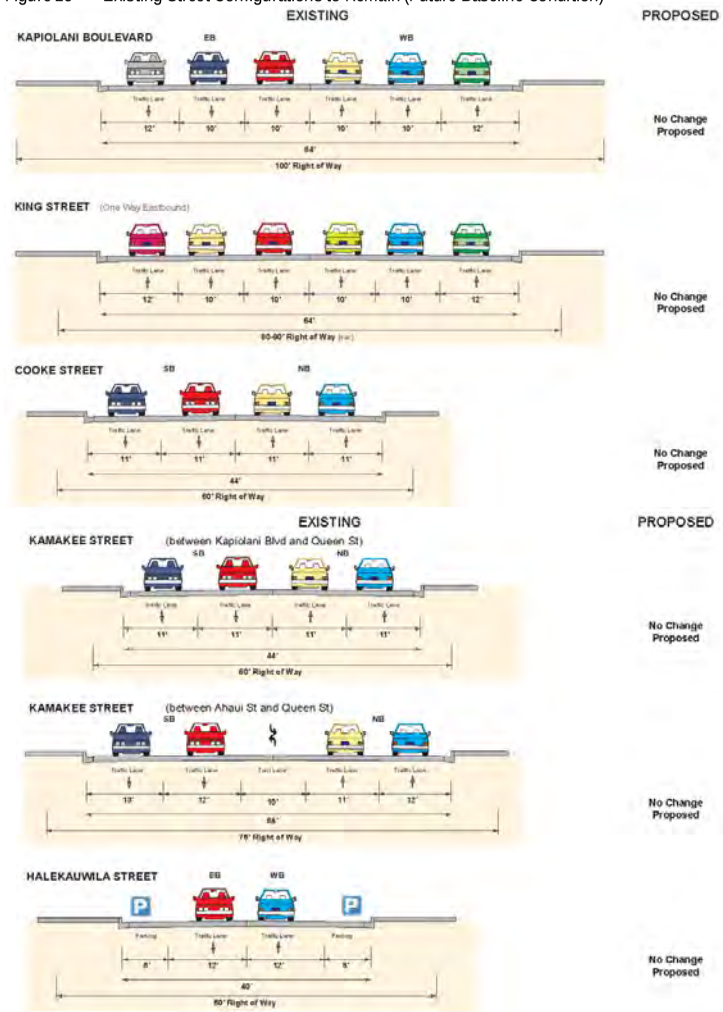
Figure 24 Existing Street Configuration to Remain – Pokoi / Pensacola (Future Baseline Condition)



Source: Kaka`ako Mauka Area Plan SEIS Transportation Analysis, April 14, 2009

Note: although the 2009 Plan recommended conversion of the existing one-way segments of Piikoi and Pensacola (north of Kapiolani Street) to two-way (as shown above on Figure 24), the 2009 SEIS Transportation Assessment included a mitigation removing the proposed 2-way conversion of Piikoi and Pensacola Streets from the 2009 Plan. Based on that mitigation, this assessment assumes the 1-way segments will remain under the Future Baseline Condition.

Figure 25 Existing Street Configurations to Remain (Future Baseline Condition)



Source: Kaka`ako Mauka Area Plan SEIS Transportation Analysis, April 14, 2009

Figure 26 Existing Street Configurations to Remain (Future Baseline Condition)

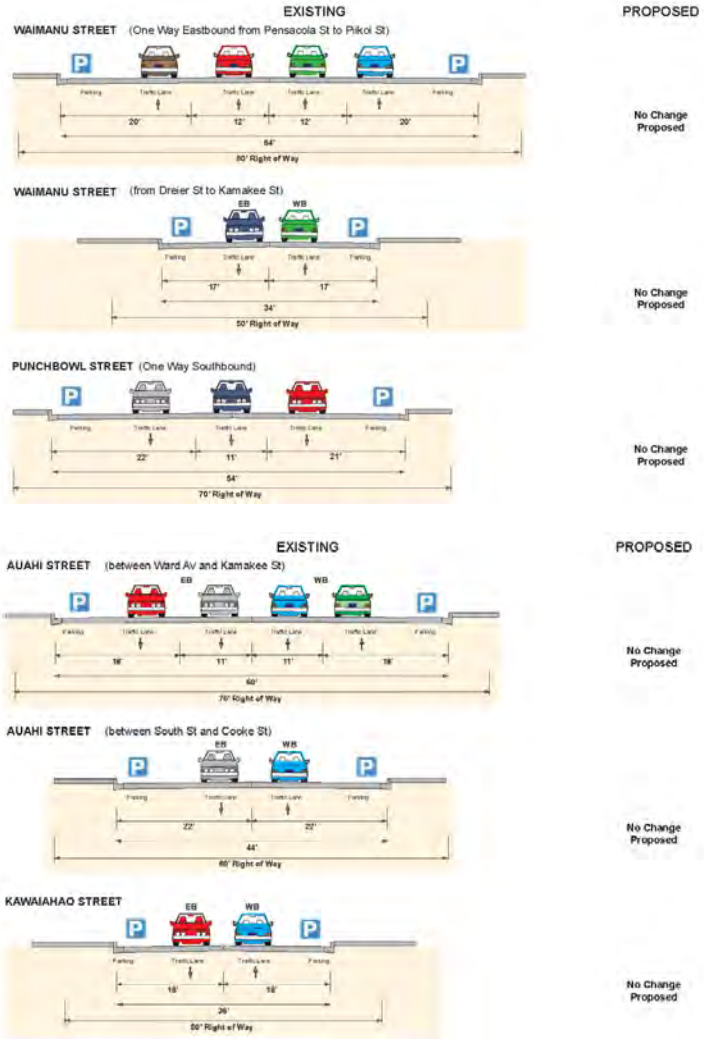
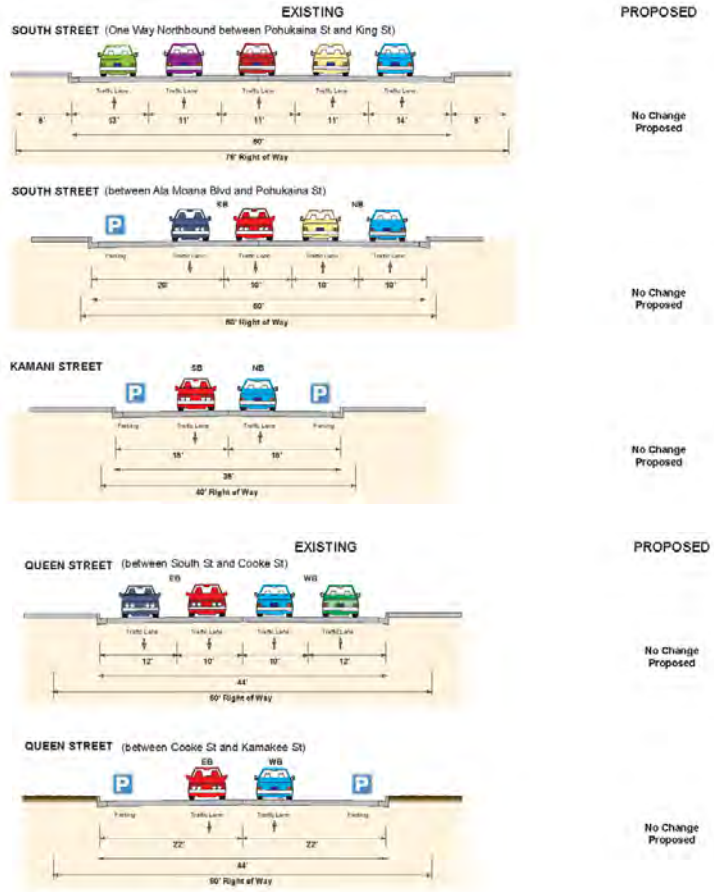


Figure 27 Existing Street Configurations to Remain (Future Baseline Condition)



Source: Kaka`ako Mauka Area Plan SEIS Transportation Analysis, April 14, 2009

3.3 TRAFFIC OPERATIONS – YEAR 2035 FUTURE BASELINE CONDITION

Traffic Volumes – Year 2035 Baseline (Future Baseline Condition)

Year 2035 Baseline traffic volumes at each study intersection were estimated based on the anticipated net change in traffic volumes as determined by the OMPO model outputs. Forecast daily traffic volumes are summarized on Figure 28, and forecast AM and PM Peak Hour volumes are shown on Figures 29 to 31.

A comparison of Existing PM peak hour traffic volumes and the forecast Future Baseline Condition PM peak hour traffic volumes yields the following findings:

- Traffic volumes at study intersections in the PM peak hour would be an average of 12 percent higher in the Future Baseline Condition alternative than under Existing Conditions.
- The largest increases in PM Peak Hour intersection volumes under the Future Baseline Condition would occur at the following five intersections, where the total 4-way approach volume is forecasted to increase by over 1,000 vehicles (representing an increase of over 30 percent at these locations):
  - Pensacola at Kapiolani
  - Ward at Kapiolani
  - Ward at Auhi
  - Ward at Queen
  - Cooke at Queen
- PM Peak Hour volumes at intersections on Ala Moana Boulevard are forecast to increase within a range varying from approximately 250 to 600 vehicles per intersection – representing an increase in volume at each intersection varying between approximately 7 to and approximately 14 percent as compared to Existing volumes.

Figure 28 Daily Traffic Volumes, Year 2035 Baseline (Future Baseline Condition)

Figure 29 Peak Hour Intersection Traffic Volumes, Year 2035 Baseline (Future Baseline Condition)

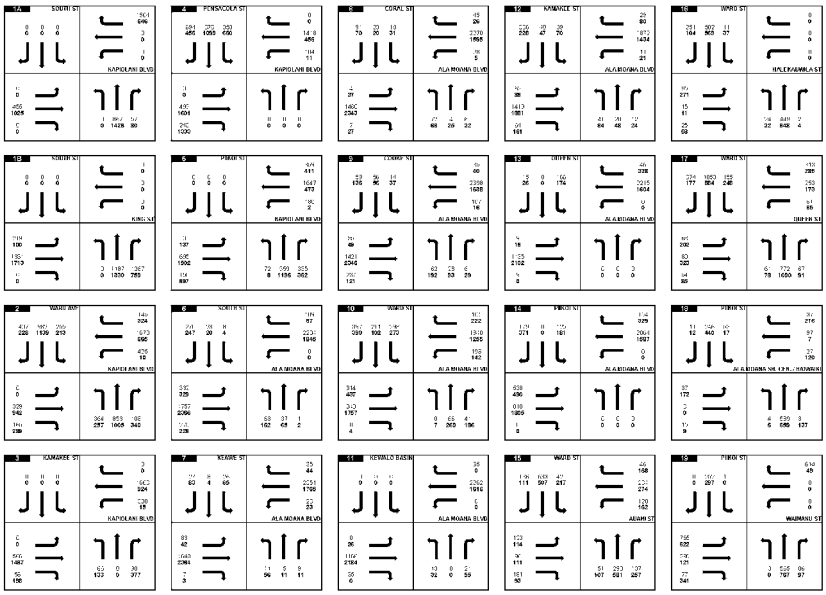


Figure 30 Peak Hour Intersection Traffic Volumes, Year 2035 Baseline (Future Baseline Condition)

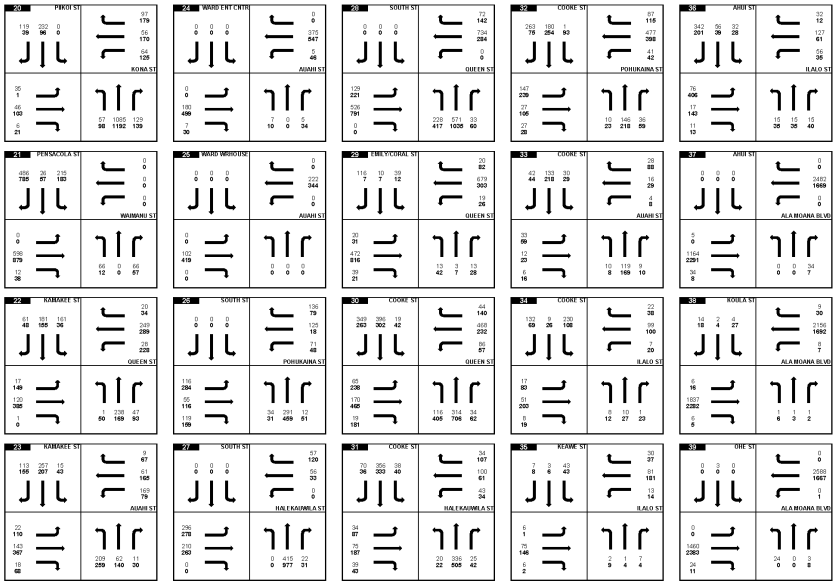
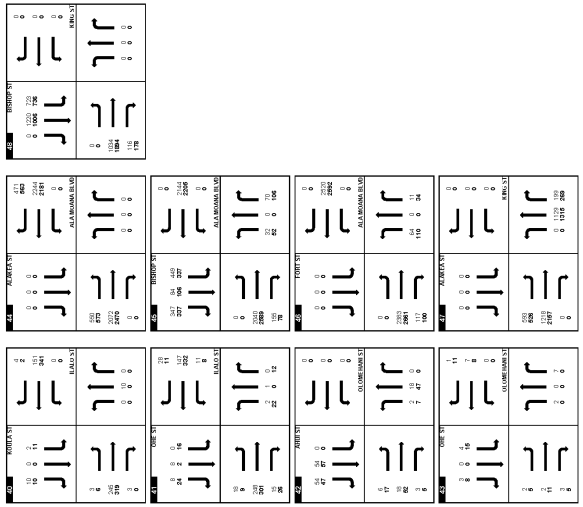


Figure 31 Peak Hour Intersection Traffic Volumes. Year 2035 Baseline (Future Baseline Condition)



LEGEND
= AM Peak Hour Volume
= PM Peak Hour Volume

Intersection Level of Service (Future Baseline)

Based on the forecast peak-hour traffic volume under Year 2035 Baseline conditions, the anticipated LOS was determined for each study intersection. Table 13 provides a comparison of Existing and Year 2035 Baseline (Future Baseline Condition) LOS at each study intersection during the AM and PM Peak Hours.

Table 13 Peak Hour Intersection Level of Service, Year 2035 Baseline (Future Baseline Condition)

			Existing		2035 Baseline (Future Baseline Condition)	
#	Street Names	Control Type	AM LOS (Delay)	PM LOS (Delay)	AM LOS (Delay)	PM LOS (Delay)
1a	South at Kapiolani	Signalized	B (19)	C (24)	C (21)	C (25)
1b	King at Alapai	Signalized	C (24)	C (21)	D (40)	C (22)
2	Ward at Kapiolani	Signalized	D (46)	D (39)	F (>80)	F (>80)
3	Kamakee at Kapiolani	Signalized	A (<10)	C (24)	A (<10)	D (44)
4	Pensacola at Kapiolani	Signalized	B (19)	C (20)	E (75)	E (78)
5	Piikoi at Kapiolani	Signalized	B (18)	C (26)	D (36)	C (24)
6	South/Forest at Ala Moana	Signalized	E (58)	E (71)	F (>80)	E (58)
7	Keawe at Ala Moana	Signalized	*D (<55)	*C (<35)	*E (<80)	*D (<55)
8	Coral at Ala Moana	Signalized	*C (<35)	*C (<35)	*D (<55)	*D (<55)
9	Cooke at Ala Moana	Signalized	D (41)	*D (<55)	F (>80)	*E (<80)
10	Ward at Ala Moana	Signalized	E (59)	E (57)	F (>80)	F (>80)
11	Kewalo Basin at Ala Moana	Not signalized	B (11)	A (<10)	A (<10)	A (<10)
12	Kamakee at Ala Moana	Signalized	A (<10)	B (13)	C (22)	B (12)
13	Queen at Ala Moana	Signalized	B (15)	B (14)	B (14)	B (18)
14	Piikoi at Ala Moana	Signalized	C (26)	C (23)	C (26)	B (19)
15	Ward at Auahi /Pokukaina	Signalized	B (12)	B (13)	B (17)	B (19)
16	Ward at Halakauwila	Signalized	A (<10)	B (15)	A (<10)	B (14)
17	Ward at Queen	Signalized	B (19)	C (31)	C (33)	F (>80)
18	Piikoi at Auahi	Signalized	A (<10)	B (15)	B (14)	B (14)
19	Piikoi at Waimanu	Signalized	B (17)	B (18)	C (25)	B (20)
20	Piikoi at Kona	Signalized	A (<10)	B (12)	B (12)	B (16)
21	Pensacola at Waimanu	Signalized	D (43)	C (34)	D (49)	D (51)
22	Queen at Kamakee	Signalized	C (30)	C (34)	C (21)	D (52)

			Existing		2035 Baseline (Future Baseline Condition)	
#	Street Names	Control Type	AM LOS (Delay)	PM LOS (Delay)	AM LOS (Delay)	PM LOS (Delay)
23	Kamakee at Auahi	Signalized	B (17)	C (31)	C (23)	C (31)
24	Ward Entertainment Center dwy at Auahi	Signalized	A (<10)	A (<10)	A (<10)	B (11)
25	Ward Warehouse driveway at Auahi	Signalized	A (<10)	A (<10)	A (<10)	A (<10)
26	South at Pohukaina	Signalized	B (19)	C (20)	B (19)	C (22)
27	South at Halakauwila	Signalized	B (16)	C (21)	B (23)	C (25)
28	Queen at South	Signalized	B (16)	B (20)	B (18)	C (22)
29	Coral/Emily at Queen	Signalized	B (11)	A (<10)	A (<10)	A (<10)
30	Cooke at Queen	Signalized	B (19)	C (22)	B (18)	E (78)
31	Cooke at Halakauwila	Planned signal**	B (11)	B (16)	B (19)**	B (16)**
32	Cooke at Pohukaina	Planned signal**	A (<10)	C (14)	B (14)**	B (13)**
33	Auahi at Cooke	TWSC	B (11)	B (13)	B (11)	B (13)
34	Cooke at Ilalo	TWSC	B (11)	A (<10)	A (<10)	A (<10)
35	Keawe at Ilalo	TWSC	A (<10)	B (14)	B (12)	B (14)
36	Ahui at Ilalo/Ward	AWSC	A (<10)	A (<10)	B (12)	C (15)
37	Ahui at Ala Moana	TWSC	A (<10)	A (<10)	A (<10)	A (<10)
38	Koula at Ala Moana	Signalized	*C (<35)	*D (<55)	*C (<35)	*E (<80)
39	Ohe at Ala Moana	TWSC	B (15)	C (17)	D (31)	C (17)
40	Ilaho at Koula	TWSC	A (<10)	A (<10)	B (11)	B (11)
41	Ohe at Ilalo	TWSC	B (11)	B (11)	B (13)	C (18)
42	Ahui at Olomehani	TWSC	A (<10)	A (<10)	A (<10)	A (<10)
43	Driveway/Ohe at Olomehani	TWSC	A (<10)	A (<10)	A (<10)	A (<10)
44	Ala Moana at Alakea	Signalized	B (16)	B (15)	B (14)	B (13)
45	Bishop at Ala Moana	Signalized	C (21)	C (33)	C (26)	E (57)
46	Fort at Ala Moana	Signalized	A (<10)	A (<10)	A (<10)	A (<10)
47	Alakea at King	Signalized	C (24)	B (19)	C (26)	D (50)
48	Bishop at King	Signalized	C (25)	D (36)	C (30)	D (37)

* Reflects estimate of additional delay due to downstream capacity constraints.
**Planned signalization described as mitigation in 2009 EIS.

3.4 PUBLIC TRANSIT – YEAR 2035 FUTURE BASELINE CONDITION

Planned Transit

Honolulu Authority for Rapid Transit (HART) is building an elevated rapid transit line that will serve the City and County of Honolulu. The system will begin in East Kapolei and connect with the Honolulu International Airport and downtown Honolulu, ending at Ala Moana Center. Ridership is estimated at 116,300 weekday passenger trips by the year 2030, with trains arriving every three minutes during peak travel times, every six minutes during the day, and every ten minutes in the evenings.

The light rail system is scheduled to be in full operation by 2019 and is therefore included in the transit analysis because it will provide significant new transit capacity to the study area. The initial section of the rail transit system, from Kapolei to Aloha Stadium, is slated to open in 2017; the entire system, from Kapolei to Ala Moana Center, is scheduled to open in 2019.

The introduction of rapid transit to the KCDD will significantly change the dynamic for access to the district and mobility between the district and adjacent areas on the line. Much of the Mauka neighborhood is within 5 to 10 minute walking distance(approximately .25 to .5 miles) of the three planned HART rapid transit stations in the District, (see TOD Overlay Plan Figure 5-12). These stations will provide a previously unattainable level of connectivity and convenience in travel for those moving between KCDD and many other parts of the Honolulu metro area. The stations will be:

- **Civic Center Station:** Located on Halekauwila Street between South and Keawe Streets, this station site is adjacent to land that is part of Kamehameha School's Kalaulu O Kaka`ako Master Plan area.
- **Kaka`ako Station:** This station is planned by the City to be located on property that is part of the Ward Neighborhood Master Plan. The station site is positioned on the corner of Ward Avenue and Queen Street and will operate as the closest stop to Kewalo Basin boat harbor, the Ewa side of Ala Moana Beach Park, the Diamond Head side of Kaka`ako Waterfront Park and the Blaisdell Arena, Exhibition and Concert Halls.
- **Downtown Station (at the Aloha Tower Special District):** Located adjacent to the Aloha Tower Special District. The City intends this station to serve Honolulu's Central Business District.

Additionally, the KCDD has significant access to TheBus transit service, with major service corridors provided on King, Kapolani, and Ala Moana. Stops on Punchbowl, King, and Ala Moana are among the busiest transit boarding locations in Honolulu.

The expected transit network after implementation of the fixed guideway system is illustrated in Figure 32.

Figure 32 Planned Transit Network (Year 2035 Future Baseline)

Source: Kaka`ako Mauka Area Plan Supplemental Environmental Impact Statement Transportation Analysis, April 14, 2009.

Transit Ridership & Capacity, Year 2035 Future Baseline Condition

HART is expected to substantially increase capacity in the west and east screenlines. HART is also expected to draw new riders to transit because planned improvements in speed, reliability, and frequency, thus causing an increase in ridership across the west screenline.

As shown on Table 14, under the Future Baseline Condition, capacity utilization in the AM and PM peak periods is still well below the 80 to 90 percent threshold of significance for this analysis (this is the same threshold that was identified in the 2009 EIS) . Figures 33 and 34 summarize screenline capacity utilization for AM and PM peak hour transit capacity.

Table 14 Future Baseline Condition Transit Capacity Utilization

Screenline	Existing Conditions			Future Baseline Condition		
	Ridership	Capacity	Capacity Utilization	Ridership	Capacity	Capacity Utilization
AM Beak Hour - Inbound						
East	2,943	6,720	44%	5,713	13,850	41%
West	4,635	10,500	44%	9,677	15,680	62%
North	351	480	73%	1,195	2,280	52%
Total	7,929	17,700	45%	16,585	31,810	55%
PM Peak Hour – Outbound						
East	2,915	6,300	46%	6,108	15,440	40%
West	4,645	10,590	44%	9,873	16,490	60%
North	440	660	67%	1,338	2,220	60%
Total	8,000	17,550	46%	17,489	34,150	51%

Source: 2009 EIS

Figure 33 Future Baseline Condition Transit Capacity Utilization AM Peak Hour

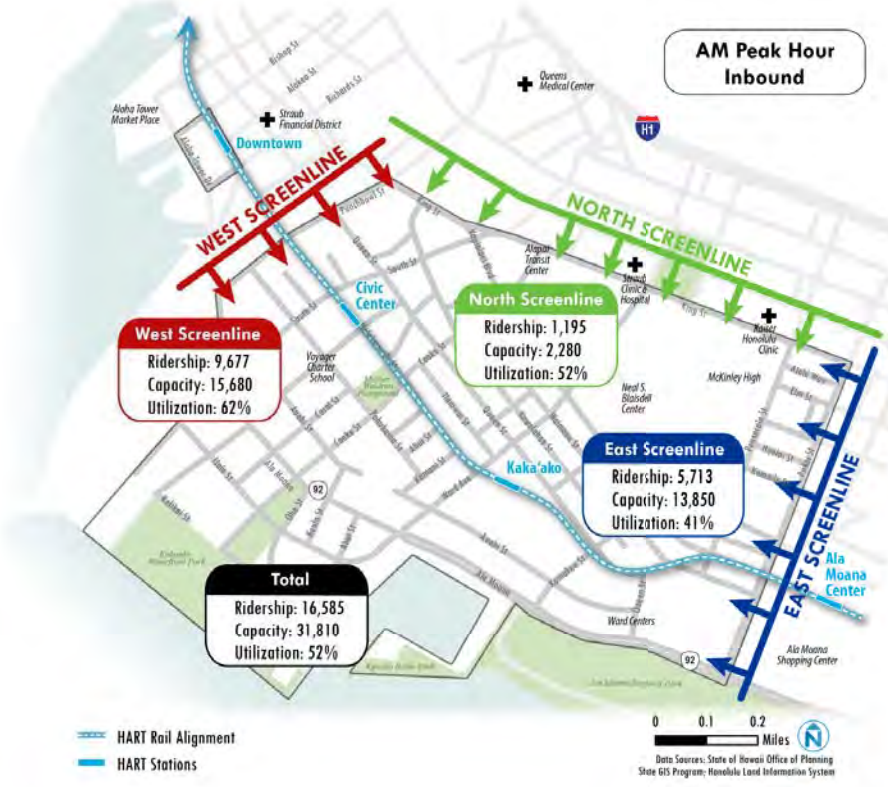
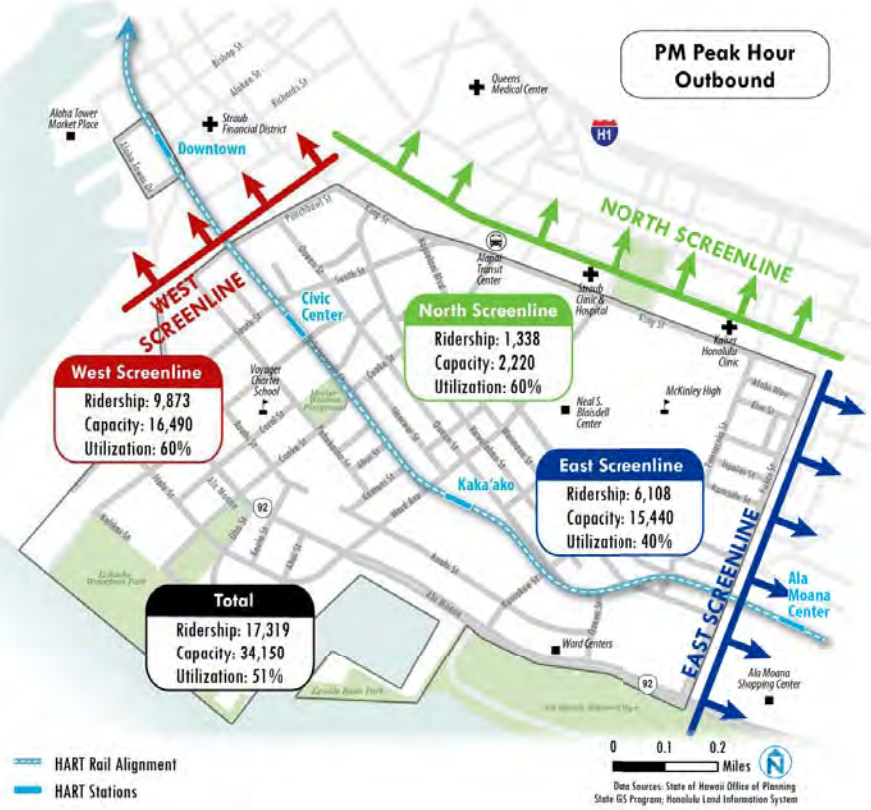


Figure 34 Future Baseline Condition Transit Capacity Utilization PM Peak Hour



3.5 BICYCLE CIRCULATION – YEAR 2035 FUTURE BASELINE CONDITION

Planned Bikeway Improvements (Future Baseline Condition)

The Future Baseline Condition alternative applies the proposed street network improvements from the existing Mauka and Makai Area Plans. As shown on Figures 23 to 27:

- No bicycle lanes are included in the Future Baseline Condition, based on the proposed street changes identified in the 2009 SEIS.

Based on the Mauka Area Plan EIS process in 2009, the following bikeway improvements were proposed for the project area:

- Suggested future restriping of existing four-lane roadways to accommodate bicycle lanes (but specific corridors were not identified at that time)
- Recommended change Cooke Street, Pohukaina Street, and Kamakee Street into bicycle-friendly streets that allow for safe bicycle connections to existing open space in the area (but no project extent, bikeway type, or facility recommendation was identified).

Forecasted Volume of Bicycle Trips (Future Baseline Condition)

Compared to the Existing condition, the Future Baseline Condition is expected to generate an additional 1,030 bicycle trips in the AM peak period and an additional 1,387 bicycle trips in the PM peak period. However, the projected increase in bicyclists is not yet supported by targeted safety or connectivity improvements under the Future Baseline Condition.

3.6 PEDESTRIAN CIRCULATION – YEAR 2035 FUTURE BASELINE CONDITION

Planned Pedestrian Improvements (Future Baseline Condition)

The Future Baseline Condition (existing Mauka and Makai Area Plans) proposes crosswalks at all intersections and sidewalks along all or most streets. These improvements are intended to better orient Kaka`ako's streets and buildings to pedestrians, an improve pedestrian safety, particularly in Central Kaka`ako where many streets lack curbs and sidewalks.

In general, the Future Baseline Condition calls for a well-developed network of pedestrian-friendly streets with wide, landscaped sidewalks and active building frontage that invites pedestrian traffic. Cooke Street, Pohukaina Street, and Kamakee Street are designated as "green" streets and connect pedestrians and bicyclists with park and open space facilities.

Several streets like Auahi Street, Pohukaina Street, Ala Moana Boulevard, Punchbowl Street, Cooke Street, and Kamakee Street are planned to undergo "Promenade" treatments with 15-foot sidewalks. This would be accomplished by a combination of either curb-to-curb width reduction and/or requiring redevelopment setbacks.

The Future Baseline Condition also proposes intersection improvements at:

- Cooke Street / Ala Moana Boulevard;
- Ward Avenue / Queen Street;

- Ward Avenue / Pohukaina Street;
- Ward Avenue / Ala Moana Boulevard;
- Kamakee Street / Ala Moana Boulevard; and,
- Piikoi Street / Ala Moana Boulevard.

These six intersections would be reconstructed with high visibility crosswalk design—such as ladder striping, flashing beacons, and improved signage—in order to encourage mauka-makai connectivity and improve crossing safety across major thoroughfares. The Future Baseline Condition also proposed planters, street furniture such as benches, and on-street parking to help create a buffer zone between pedestrians and street traffic.

The planned widening of Ala Moana Boulevard from 72 to 84 feet (identified as a mitigation in the 2009 SEIS) would increase pedestrian crossing distances under Year 2035 conditions.

Forecasted Volume of Pedestrian Trips (Future Baseline Condition)

Compared to the Existing condition, the Future Baseline Condition is expected to generate an additional 4,637 pedestrian crossings in the AM peak period and an additional 6,239 pedestrian crossings in the PM peak period. Given the projected increase in pedestrian crossings spread across the project area's pedestrian network, the lack of sidewalks along various industrial streets and pedestrian delay at some arterial signalized intersections could limit pedestrian circulation at some locations under the Future Baseline Condition.

FUTURE CONDITIONS WITH TOD ALTERNATIVE A

This section provides a comparison of travel conditions in Year 2035 under the TOD Alternative A (Draft TOD Overlay Plan). The travel demand forecast under Year 2035 conditions was derived from the Regional Model, based on the projected level of development under the TOD Alternative A.

4.1 TRIP GENERATION & TRAVEL MODES

Travel Demand Forecast – TOD Alternative A

The OMPO model was utilized to provide a forecast of trip generation based on Future Baseline Condition and TOD Alternative A (Year 2035 TOD Plan) land uses. The net change to trip generation was derived based on existing land uses under the OMPO Model Year 2015 Baseline scenario. Table 15 provides a summary of the travel demand forecast.

Table 15 Travel Demand Comparison

	Existing Condition (2015 Model Base Year)	Future Baseline Condition (2035 Model Baseline)	Future Baseline + TOD Alternative A (2035 TOD Overlay)
Households	11,867	38,221	51,393
Net Change from Existing		26,354	39,526
Percent Increase over Existing		222%	333%
Retail Employment	7,916	16,840	15,706
Non-Retail Employment	28,303	44,739	39,923
Total Daily Person Trips	286,878	569,295	679,059
Net Change from Existing		282,417	392,181
Percent Increase over Existing		98%	136%
Internal Capture	36.7%	51.3%	53.2%
External Person Trips (daily)	181,594	277,247	317,800
Net Change from Existing		95,653	136,206
Percent Increase over Existing		53%	75%

Based on the travel demand model forecast:

- **Total volume of travel:** Total daily person trips by all modes traveling to, from, or within the study area, would essentially double under the Future Baseline Condition, with a 98 percent increase over the Existing Condition. Under the TOD Alternative A, total daily person trips by all modes would increase by 136 percent over the Existing Condition.

- **Trips internal to the study area:** The portion of trips internal to the study area would increase from 36 percent under Existing Conditions to 51 percent under the Future Baseline Condition, with a further increase to 53 percent under the TOD Alternative A.

Travel Mode Comparison – TOD Alternative A

Table 16 provides a comparison of travel mode choice predicted by the OMPO model forecast, which indicates that:

- Walk and bike trips would increase from 15.5 percent of total daily trips under Existing Conditions to:
  - 20.1 percent under the Future Baseline Condition
  - 21.7 percent of daily trips under the TOD Alternative A
- Motor vehicle trips would decrease from 77.3 percent of total daily trips under Existing Conditions to:
  - 71.3 percent of under the Future Baseline Condition
  - 69.6 percent under the TOD Alternative A
- Transit trips would increase from 7.2 percent of total daily trips under Existing Conditions to 8.7 percent under both the No Action and TOD Alternative A.

Table 16 Travel Mode Comparison – TOD Alternative A

	Existing Conditions (2015 Model Base Year)	Future Baseline Condition (2035 Model Baseline)	Future Baseline + TOD Alternative A (2035 TOD Overlay)
Public Transit	7.2%	8.7%	8.7%
Walk + Bike	15.5%	20.1%	21.7%
Motor Vehicles	77.3%	71.3%	69.6%

Source: OMPO model with Changes to Land Uses within KCDD

Trip Generation Forecast – TOD Alternative A

The OMPO model forecast of daily motor vehicle, transit and bike/walk trips under Existing and Year 2035 conditions, under both the Future Baseline Condition and TOD Alternative A, is shown on Table 17.

Based on this forecast, the TOD Alternative A will generate the following net increases in trips in comparison to the Future Baseline Condition:

- Walk/bike trips: 29 percent increase over the Future Baseline Condition
- Transit trips: 19 percent increase over the Future Baseline Condition
- Motor vehicle trips: 16 percent increase over the Future Baseline Condition based on daily trips, while the increase in peak-hour motor vehicle trips would be smaller:
  - 7 percent increase over the Future Baseline Condition during the AM Peak Hour
  - 9 percent increase over the Future Baseline Condition during the PM Peak Hour

Table 17 Trip Generation Forecast – TOD Alternative A

	Motor Vehicle Trips			Transit Trips	Walk/ Bike Trips
	AM Peak Hour	PM Peak Hour	Daily	Daily	Daily
Total Trip Generation					
Existing Land Uses	13,822	9,249	184,797	20,655	44,466
Future Baseline Condition	25,380	28,313	338,256	49,528	114,428
Future Baseline + TOD Alternative A	27,191	30,783	393,854	59,078	147,356
Pct Increase over Existing	*97%*	*233%*	*113%*	*186%*	*231%*
Pct Change over Future Baseline Condition	*7%*	*9%*	*16%*	*19%*	*29%*
Net Trip Generation Comparison					
Future Baseline Condition	11,558	19,064	153,459	28,873	69,962
Future Baseline + TOD Alternative A	13,369	21,534	209,057	38,423	102,890
TOD Alternative A : Net Change over Future Baseline	*1,811*	*2,470*	*55,598*	*9,550*	*32,928*

4.2 ROADWAY NETWORK CHANGES – TOD ALTERNATIVE A

Potential changes to the roadway network under the TOD Alternative A are described in the Draft TOD Overlay Plan include:

- Proposed roadway network connections to facilitate internal circulation within the KCDD as shown on Figure 35.
  - Analysis of the proposed restoration of two-way operation on Piikoi and Pensacola Street was excluded from the analysis because the regional-serving character of the roadways, with their direct connections to the H-1 freeway, is beyond the scope of the present analysis.
- Designation of priority streets for Motor Vehicles, Bicycles, and Pedestrians as shown on Figures 36 to 38.

Figure 35 Action Alternative – Proposed Street Connections

Kakaako Community Development District TOD Overlay Plan | FEIS Transportation Analysis
Hawaii Community Development Authority

Figure 36 Action Alternative – Proposed Motor Vehicle Priority Streets

Figure 37 Action Alternative – Proposed Bicycle Priority Streets

Figure 38 Action Alternative – Proposed Pedestrian Priority Streets

4.3 TRAFFIC IMPACTS

Traffic Volumes

Based on the anticipated change in traffic volumes comparing the TOD Alternative A model results to the Future Baseline Condition, the anticipated distribution of daily traffic volumes are shown on Figure 39. Detailed intersection volumes for each of the key study area intersections are shown on Figures 40 through 42.

Figure 39 Year 2035 Traffic Volumes on Key Corridors (TOD Alternative A)

Figure 40 Peak Hour Intersection Traffic Volumes, Year 2035 (TOD Alternative A)

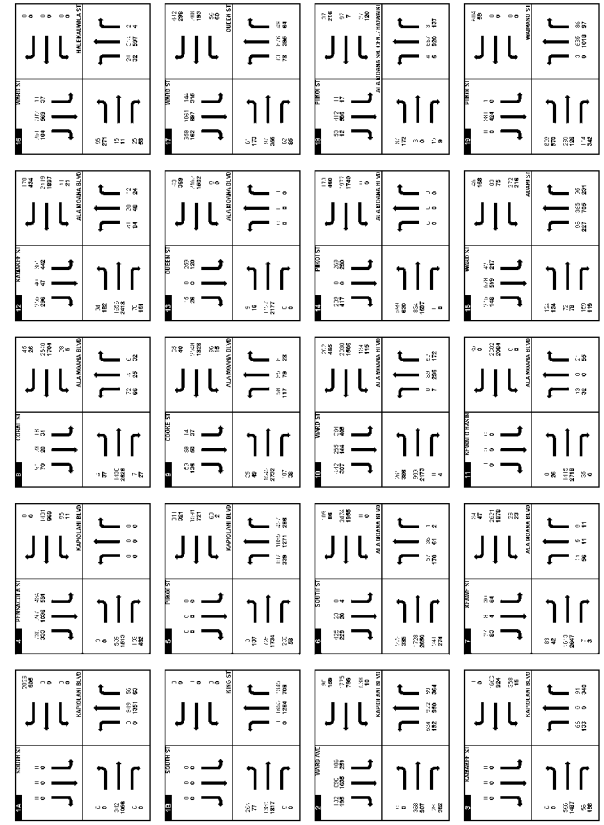
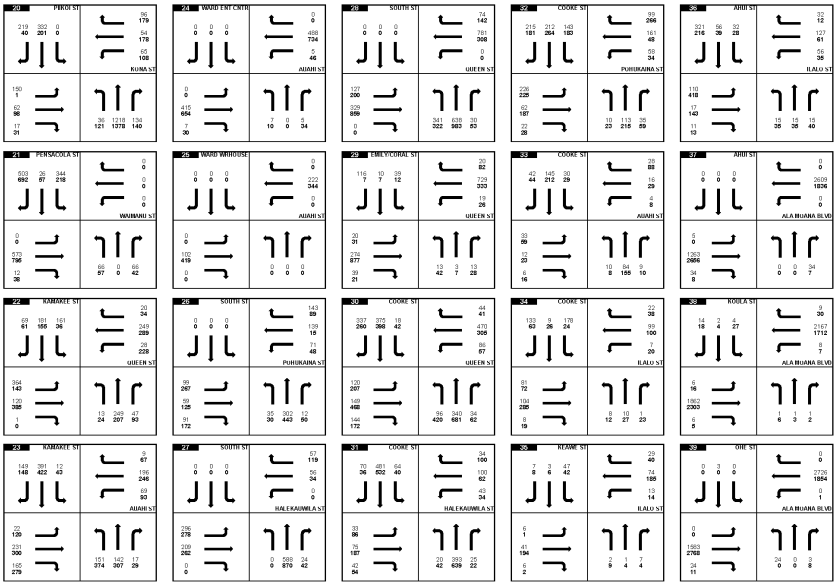
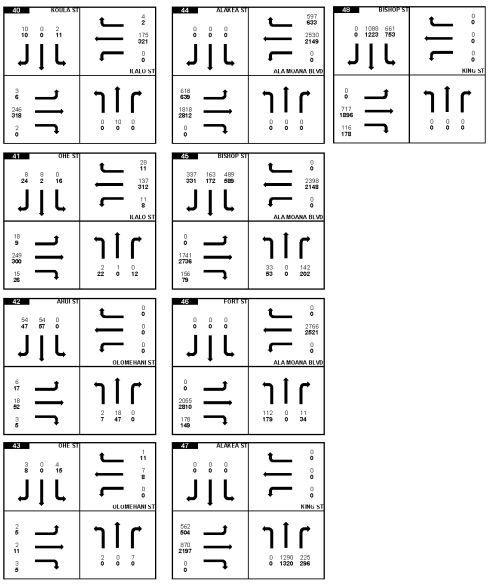


Figure 41 Peak Hour Intersection Traffic Volumes, Year 2035 (TOD Alternative A)



LEGEND
= AM Peak Hour Volume
= PM Peak Hour Volume

Figure 42 Peak Hour Intersection Traffic Volumes, Year 2035 (TOD Alternative A)



LEGEND
= AM Peak Hour Volume
= PM Peak Hour Volume

Traffic Operations under TOD Alternative A (Year 2035)

Based on the forecasted peak hour traffic volume, Table 18 compares the Year 2035 projected Level of Service for key study area locations under both the Future Baseline Condition and TOD Alternative A.

Table 18 Peak Hour Intersection Level of Service, Year 2035 (TOD Alternative A)

			Future Baseline Condition (2035 Baseline)		Future Baseline + TOD Alternative A (2035 TOD Overlay)	
#	Street Names	Control Type	AM LOS (Delay)	PM LOS (Delay)	AM LOS (Delay)	PM LOS (Delay)
1a	South at Kapiolani	Signalized	C (21)	C (25)	C (25)	C (24)
1b	King at Alapai	Signalized	D (42)	C (22)	D (48)	C (23)
2	Ward at Kapiolani	Signalized	F (>80)	F (>80)	F (>80)	E (63)
3	Kamakee at Kapiolani	Signalized	A (<10)	D (44)	A (5)	C (33)
4	Pensacola at Kapiolani	Signalized	E (75)	E (78)	E (56)	C (27)
5	Piikoi at Kapiolani	Signalized	D (36)	C (24)	C (22)	C (26)
6	South/Forest at Ala Moana	Signalized	F (>80)	E (58)	F (>80)	E (60)
7	Keawe at Ala Moana	Signalized	*E (<80)	*D (<55)	*E (<80)	*D (<55)
8	Coral at Ala Moana	Signalized	*D (<55)	*D (<55)	*D (<55)	*D (<55)
9	Cooke at Ala Moana	Signalized	F (>80)	*E (<80)	F (>80)	*E (<80)
10	Ward at Ala Moana	Signalized	F (>80)	F (>80)	F (>80)	F (>80)
11	Kewalo Basin driveway at Ala Moana	Not signalized	A (<10)	A (<10)	A (>10)	A (>10)
12	Kamakee at Ala Moana	Signalized	C (22)	B (12)	E (71)	E (56)
13	Queen at Ala Moana	Signalized	B (14)	B (18)	B (12)	C (25)
14	Piikoi at Ala Moana	Signalized	C (26)	B (19)	D (38)	C (28)
15	Ward at Auahi	Signalized	B (17)	B (19)	B (17)	B (18)
16	Ward at Halakauwila	Signalized	A (<10)	B (14)	B (11)	B (13)
17	Ward at Queen	Signalized	C (33)	F (>80)	E (57)	F (>80)
18	Piikoi at Auahi	Signalized	B (14)	B (14)	B (13)	B (14)
19	Piikoi at Waimanu	Signalized	C (25)	B (20)	C (29)	B (19)
20	Piikoi at Kona	Signalized	B (12)	B (16)	B (14)	B (18)
21	Pensacola at Waimanu	Signalized	D (49)	D (51)	D (52)	D (48)
22	Queen at Kamakee	Signalized	C (21)	D (52)	C (28)	D (52)
23	Kamakee at Auahi	Signalized	C (23)	C (31)	C (30)	C (31)

24	Ward Entertainment Center driveway at Auahi	Signalized	A (<10)	B (11)	A (<10)	B (11)
25	Ward Warehouse driveway at Auahi	Signalized	A (<10)	A (<10)	A (<10)	A (<10)
26	South at Pohukaina	Signalized	B (19)	C (22)	C (23)	C (21)
27	South at Halakauwila	Signalized	B (23)	C (25)	B (13)	C (23)
28	Queen at South	Signalized	B (18)	C (22)	B (18)	C (21)
29	Coral/Emily at Queen	Signalized	A (<10)	A (<10)	B (11)	A (<10)
30	Cooke at Queen	Signalized	B (18)	E (78)	B (20)	E (76)
31	Cooke at Halakauwila	Planned signal*	B (19)	B (16)	B (16)	B (15)
32	Cooke at Pohukaina	Planned signal*	B (14)	B (13)	C (29)	B (14)
33	Auahi at Cooke	TWSC	B (11)	B (13)	B (11)	B (13)
34	Cooke at Ilalo	TWSC	A (<10)	A (<10)	A (<10)	A (<10)
35	Keawe at Ilalo	TWSC	B (12)	B (14)	A (<10)	C (16)
36	Ahui at Ilalo/Ward	AWSC	B (12)	C (15)	B (12)	C (16)
37	Ahui at Ala Moana	TWSC	A (<10)	A (<10)	B (12)	B (11)
38	Koula at Ala Moana	Signalized	*C (<35)	*E (<80)	*C (<35)	*E(<80)
39	Ohe at Ala Moana	TWSC	D (31)	C (17)	D (31)	C (20)
40	Ilaho at Koula	TWSC	B (11)	B (11)	B (11)	B (11)
41	Ohe at Ilalo	TWSC	B (13)	C (18)	B (13)	C (17)
42	Ahui at Olomehani	TWSC	A (<10)	A (<10)	A (>10)	A (>10)
43	Driveway/Ohe at Olomehani	TWSC	A (<10)	A (<10)	A (>10)	A (>10)
44	Ala Moana at Alakea	Signalized	B (14)	B (13)	B (17)	B (15)
45	Bishop at Ala Moana	Signalized	C (26)	E (57)	C (22)	D (45)
46	Fort at Ala Moana	Signalized	A (<10)	A (<10)	A (<10)	A (<10)
47	Alakea at King	Signalized	C (26)	D (50)	D (44)	D (35)
48	Bishop at King	Signalized	C (30)	D (37)	C (22)	D (36)

Intersections shown in bold operate at LOS F under the Future Baseline Condition and TOD Alternative A.

*LOS as shown reflects downstream delay.
**Intersection LOS based on planned signalization described as mitigation in 2009 EIS.

Traffic Impact Findings

Traffic impacts are considered significant if:

- The TOD Alternative A causes the level of service to deteriorate from LOS E or better under the Future Baseline Condition to LOS F under the TOD Alternative A.

There are no intersections in the study area which would deteriorate from LOS E or better under the Future Baseline Condition to LOS F under the TOD Alternative A.

- Traffic impacts are also considered significant if the operational impacts on signalized intersections operating at LOS F under both the Future Baseline Condition and TOD Alternative A are considered significant if the volume to-capacity (v/c) ratio under the TOD Alternative A exceeds that of the Future Baseline Condition.

The following study intersections would operate at LOS F under both the Future Baseline Condition and TOD Alternative A:

- Ala Moana & South (study intersection #6)
- Ala Moana & Cooke (study intersection #9)
- Ala Moana & Ward (study intersection #10)
- Queen & Ward (study intersection #17)
- Kapiolani & Ward (study intersection #2)

Additional study intersections would operate acceptably based strictly on volume/capacity ratios at each intersection, but could be impacted by downstream delay at adjacent intersections on Ala Moana Boulevard west of Ward Street:

- Ala Maona & Keawe (study intersection #7)
- Ala Moana & Coral (study intersection #8)
- Ala Moana & Koula (study intersection #38)

The identified intersections were analyzed as described in the next section to determine whether significant traffic impacts may exist.

Findings of Significance at Impacted Intersections

Ala Moana & South

Intersection is forecast to operate at LOS F under peak-hour conditions based on the Year 2035 traffic forecast under both the Future Baseline Condition and TOD Alternative A. Since the volume to-capacity (v/c) ratio under the TOD Alternative A exceeds that of the Future Baseline Condition, this impact is significant.

Finding: potentially significant.

Ala Moana & Keawe

The volume to-capacity (v/c) ratio at this intersection would be acceptable under both the TOD Alternative A and Future Baseline Condition. However, downstream delay results in delay that could affect the operation of this intersection.

Finding: less than significant.

Ala Moana & Coral

The volume to-capacity (v/c) ratio at this intersection would be acceptable under both the TOD Alternative A and Future Baseline Condition. However, downstream delay results in delay that could affect the operation of this intersection.

Finding: less than significant.

Ala Moana & Cooke

Intersection is forecast to operate at LOS F under peak-hour conditions based on the Year 2035 traffic forecast under both the Future Baseline Condition and TOD Alternative A. Since the volume to-capacity (v/c) ratio under the TOD Alternative A exceeds that of the Future Baseline Condition, this impact is significant.

Finding: potentially significant.

Ala Moana & Koula

The volume to-capacity (v/c) ratio at this intersection would be acceptable in both the TOD Alternative A and Future Baseline Condition. However, downstream delay results in delay that could affect the operation of this intersection.

Finding: less than significant.

Ala Moana & Ward

Intersection is forecast to operate at LOS F under peak-hour conditions based on the Year 2035 traffic forecast in both the Future Baseline Condition and TOD Alternative A. Since the volume to-capacity (v/c) ratio in the TOD Alternative A exceeds that of the Future Baseline Condition, this impact is significant.

Finding: potentially significant.

Queen & Ward

Intersection is forecasted to operate at LOS F under peak-hour conditions based on the Year 2035 traffic forecast in both the Future Baseline Condition and TOD Alternative A. Since the volume to-capacity (v/c) ratio under the TOD Alternative A exceeds that of the Future Baseline Condition, this impact is significant.

Finding: significant and unavoidable impact (SU). No feasible mitigations as described in the 2009 EIS.

Kapiolani & Ward

Intersection is forecast to operate at LOS F under peak-hour conditions based on the Year 2035 traffic forecast in both the Future Baseline Condition and TOD Alternative A. Since the volume to-capacity (v/c) ratio under the TOD Alternative A exceeds that of the Future Baseline Condition, this impact is significant. The 2009 EIS included the finding that no mitigation would be feasible at this intersection; therefore this impact was identified as significant and unavoidable.

Finding: potentially significant.

4.4 TRANSIT IMPACTS

The fixed guideway transit system – HART - is currently in the planning stages for the congested east-west corridor between Kapolei and UH Manoa. HART will provide faster, more reliable transit along the corridor where many transit vehicles must operate in mixed-flow traffic, and serve as an attractive alternative to the private automobile. The project would strengthen the connection between Kapolei, Downtown Honolulu and Kakaako, UH Manoa, and Waikiki.

A major goal of the TOD Alternative A is to encourage transit oriented development, designed to facilitate and encourage transit use by placing relatively high-density development adjacent to or within easy walking access of major transit facilities such as stations on the fixed guideway system or transfer points between bus lines. TOD projects also typically encourage the use of non-motorized modes of travel, including pedestrian and bicycle travel, and discourage the use of private automobiles.

Figure 43 provides an overview of the Year 2035 transit network under both the Future Baseline Condition and TOD Alternative A scenario.

Transit Ridership & Capacity – Year 2035 (TOD Alternative A)

Because the fixed guideway system will operate along an east-west alignment through the Mauka Area, it was assigned to both the east and west screenlines for the TOD Alternative A transit analysis. TOD Alternative A capacity was taken from the 2009 EIS. TOD Alternative A ridership was estimated using the following assumptions:

- Based on a comparison of the Future Baseline Condition (2035 Baseline) and TOD Alternative A (2035 TOD Plan) outputs from the OMPO model, the TOD Alternative A will generate approximately 10,000 additional transit riders per day (net change compared to the Action).
- The assumption was made that 10 percent of daily transit trips will occur during the peak-hour. Therefore, 10,000 daily riders would correlate to 1,000 peak-hour riders in the AM peak and 1,000 peak-hour riders in the PM.
- Using the model, the 1,000 additional trips were assigned to the east, west, and north screenlines proportionally.

The resulting capacity and utilization for the TOD Alternative A transit analysis is presented in Table 19 on page 86.

Figure 43 Year 2035 Transit Network

Source: Kaka`ako Mauka Area Plan Supplemental Environmental Impact Statement Transportation Analysis, April 14, 2009.

Table 19 TOD Alternative A Transit Capacity Utilization

Screenline	Existing Conditions			Future Baseline Condition			Future Baseline + TOD Alternative A		
	Ridership	Capacity	Capacity Utilization	Ridership	Capacity	Capacity Utilization	Ridership	Capacity	Capacity Utilization
AM Beak Hour - Inbound									
East	2,943	6,720	44%	5,771	13,850	42%	5,430	13,850	39%
West	4,635	10,500	44%	9,732	15,680	62%	10,814	15,680	69%
North	351	480	73%	1,198	2,280	53%	1,195	2,280	52%
Total	7,929	17,700	45%	16,701	31,810	53%	17,439	31,810	55%
PM Peak Hour – Outbound									
East	2,915	6,300	46%	6,194	15,440	40%	5,825	15,440	38%
West	4,645	10,590	44%	9,954	16,490	60%	11,010	16,490	67%
North	440	660	67%	1,341	2,220	60%	1,341	2,220	60%
Total	8,000	17,550	46%	17,489	34,150	51%	18,173	34,150	53%

Source: Existing and Future Baseline Condition (2009 EIS); TOD Alternative A (Ridership from the OMPO model; Capacity from the 2009 EIS)

As shown in Error! Reference source not found., the fixed guideway system is expected to substantially increase capacity in the west and east screenlines. The guideway system is also expected to draw new riders to transit because of its improvement over existing bus services in terms of speed, reliability, and frequency, thus causing an increase in ridership across the west screenline. Given the increased capacity from the fixed guideway system, however, utilization will still be below the 80 to 90 percent threshold typically considered acceptable for urban areas. Peak hour screenline results are summarized on Figures 44 and 45.

Figure 44 Transit Capacity Utilization – AM Peak Hour (TOD Alternative A)

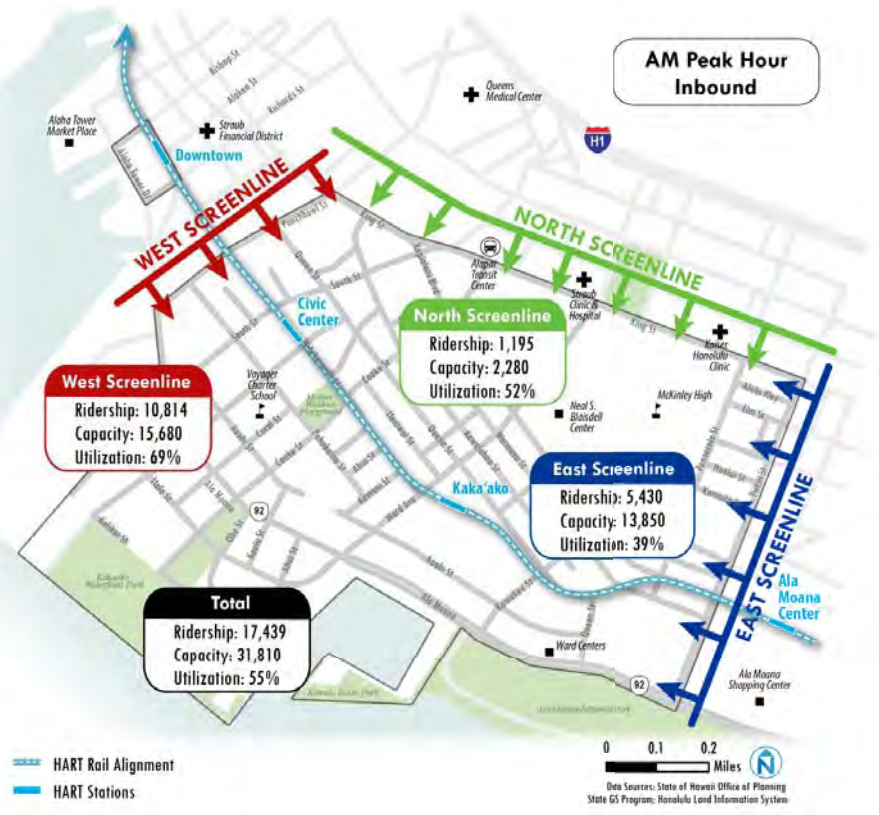
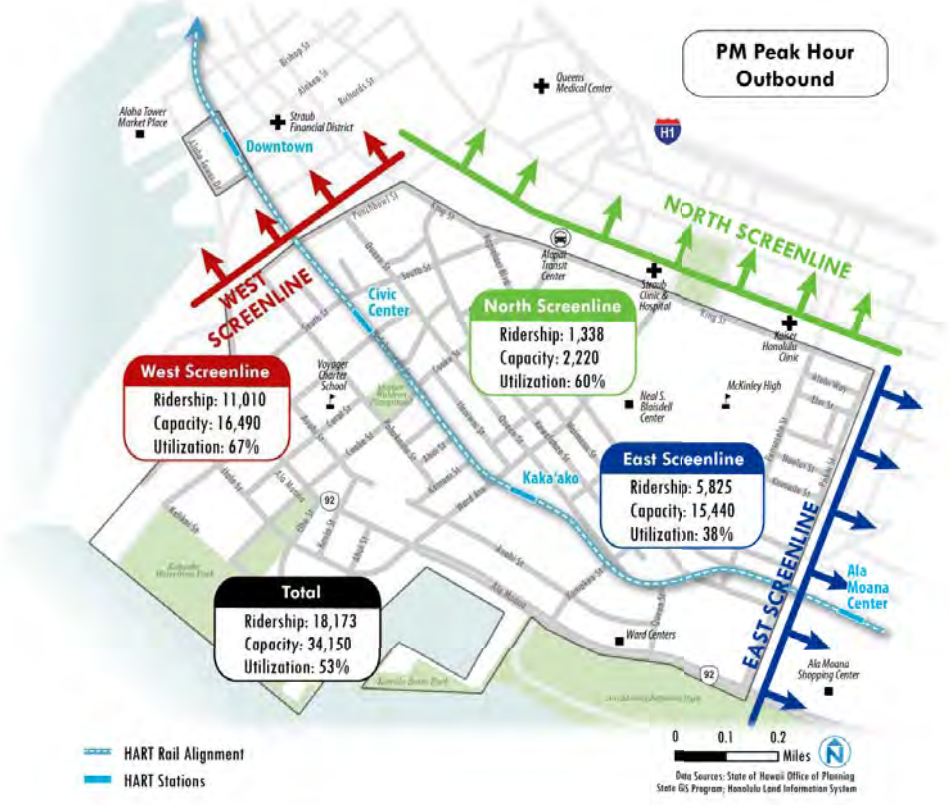


Figure 45 Transit Capacity Utilization – PM Peak Hour (TOD Alternative A)



Transit Impact Findings

Based on the transit impact criteria described in the 2009 EIS, transit impacts are considered significant if:

- The plan causes a substantial increase in transit demand that could not easily be accommodated by available transit capacity, resulting in unacceptable levels of transit crowding. Capacity utilization above 80 to 90 percent is generally considered unacceptable for urban transit services.
- The plan causes a substantial increase in operational delay or costs that could result in adverse impacts to transit service.

The fixed guideway system is expected to substantially increase capacity on the west and east screenlines. The capacity utilization on all screenlines (north, east, and west) in the AM and the PM peak is not expected to exceed 69%. Therefore, there is no significant transit impact resulting from the TOD Alternative A and no additional mitigations are required.

Regarding operational delay, traffic delay under the TOD Alternative A is not anticipated to result in a level of delay to buses that would require additional buses or operating costs compared to the Future Baseline condition. Therefore, there is no significant transit operations impact resulting from the TOD Alternative A and no additional mitigations are required

4.5 BICYCLE IMPACTS

Recommended Bicycle Network Changes (Draft TOD Overlay Plan)

The TOD Alternative A elevates several bikeway types as compared to the Future Baseline Condition to ensure greater separation from motor vehicle traffic, and proposes additional bikeways to facilitate east-west and north-south bicycle connectivity and safe bicycle operation. The Draft TOD Overlay Plan recommends the following revisions to the Future Baseline Condition bicycle network:

- Bike lanes on King Street from Piikoi Street to Punchbowl Street
- Cycle track (path)[1] or bike lanes on Ala Moana Boulevard from Piikoi Street to the ewa edge of the Aloha Tower Special District
- Cycle track (path) or bike lane couplet on Punchbowl Street and South Street between King Street and Ala Moana Boulevard
- Signed and marked bike route on Queen Street from Kamakee Street to Punchbowl Street
- Cycle track (path) or bike lanes on Halekauwila Street from Ward Avenue to the Diamond Head edge of the Aloha Tower Special District
- Signed and marked bike route on Auahi Street from Ala Moana Boulevard to Ward Avenue
- Signed and marked bike route on Ilalo Street from Ahui Street and Keawe Street
- Bike lanes on Cummins Street (developed with proposed street extension)
- Bike lanes on Ward Avenue from King Street and Ala Moana Boulevard
- Bike lanes on Kamakee Street between Kapiolani Boulevard and Ala Moana Boulevard
- Cycle track (path) or bike lane couplet on Pensacola Street from King Street to Punchbowl Street and Piikoi Street from King Street to Ala Moana Boulevard
- Signed and marked bike routes on Pohukaina Street from Ward Avenue to Punchbowl Street
- Bike path connecting the Ala Moana Regional Park multi-use path to the Kaka`ako Waterfront Park multi-use path(via Ahui Street)
- Bike path between the Neil S. Blaisdell Center and McKinley High School connecting the Kamakee Street end with King Street

The recommended improvements listed above and displayed in Figure 46 only cover bikeway project extents within the project area. These recommended improvements are not stipulated as part of the TOD Alternative A because HCDA does not have jurisdiction over streets in Kaka`ako. Thus, the recommendations in the Draft TOD Overlay Plan are only strategies and are not required improvements. The following sections summarize the impacts created as part of the TOD Alternative A and provide more targeted mitigation measures tied to the stated impacts.

[1] A cycle track is a dedicated bicycle facility type that is physically separated from adjacent travel lanes by bollards, planters, on-street parking, curbs, or any other raised material. Cycle tracks can be situated at street level, between sidewalk and street level, or at sidewalk level.

Figure 46 Recommended Bicycle Priority Streets from the Draft TOD Overlay Plan

Note: Because HCDA does not have jurisdiction over streets in Kaka`ako, recommendations in the Draft TOD Overlay Plan are only strategies and not required improvements.

Summary Findings of Significance

The following list encapsulates the potential impacts that could be observed along key bicycle corridors throughout the project area, as many corridors exhibit a variety of impacts. These impact types are based on the significance criteria listed in Section 1.3, the change in bicycling movements between the Future Baseline Condition and TOD Alternative A, and the ability of the Future Baseline Condition to connect the forecast increase in bicyclists with existing and new destinations based on the Year 2035 Land Use Comparison.

- Threefold increase in daily bicycle volumes with no commensurate or appropriate increase in bicycle capacity.
- Lack of east-west connectivity to support the substantial increase in bicycle volumes (definition of substantial increase depends on the corridor).
- Lack of north-south connectivity to support the substantial increase in bicycle volumes (definition of substantial increase depends on the corridor).
- Lack of bicycle facilities to facilitate access to all three rail stations.
- Substantial increase in turn volumes at a number of intersections along key bicycle corridors increases exposure to collision.

Compared to the Future Baseline Condition, the TOD Alternative A is expected to generate an additional 485 bicycle trips in the AM peak period and an additional 652 bicycle trips in the PM peak period. The increase in AM and PM peak period bicycle movements is summarized in Table 20.

Table 20 Bicycle Volumes – TOD Alternative A

	Existing Condition (2015 Model Baseline)	Future Baseline Condition (2035 Model Baseline)	Future Baseline + TOD Alternative A (2035 TOD Overlay)	Future Baseline + TOD Alternative A (Percent Change over Existing)	TOD Alternative A (Percent Change over Future Baseline)
Daily	8,084	20,805	26,792	231%	29%
AM Peak Hour	654	1,685	2,170	231%	29%
PM Peak Hour	881	2,267	2,920	231%	29%

Bicycle Impact Findings

The following corridors would exhibit impacts in as a result of the TOD Alternative A based on one or more of the potential impacts listed in the section above. *In each impacted corridor, a 331% increase in peak period bicycle volumes (from existing bicycle volumes to TOD Alternative A conditions) and a 129% increase in peak period bicycle volumes (from Future Baseline Condition bicycle volumes to TOD Alternative A conditions) with no corresponding available bicycle capacity triggers a significant impact.* Although bike sharing is not included in the analysis, bike share implementation (projected to produce between 1.6 and 2.1 million trip per year) will make the lack of bicycle capacity an even more severe issue. In addition, because none of the corridors that offer direct travel are furnished with dedicated bicycle facilities, increased auto turn volumes are assumed to create a potentially significant impact.

Punchbowl Street

As part of the South-Punchbowl one-way couplet, Punchbowl Street is a critical southbound bicycle connection on the ewa boundary of the project area. The projected increase in bicycle volumes along Punchbowl Street is not supported by dedicated bicycle facilities. Punchbowl Street is also a key bicycle access route to future HART stations for bicyclists originating mauka of the H1 freeway. Each of these factors and the increase in bicycle volume between the Future Baseline Condition and TOD Alternative A contributes to a significant impact.

Finding: Potentially significant

South Street

As part of the South-Punchbowl one-way couplet, South Street is a critical northbound bicycle connection on the ewa boundary of the project area. This corridor currently accommodates up to 440 daily bicycle movements.[2] The projected increase in bicycle volumes (AM, PM, and daily bicycle trips) along South Street is not supported by dedicated bicycle facilities. South Street is also a key bicycle access route from the future HART Civic Center Station for bicyclists destined for points mauka of the H1 freeway. Each of these factors and the increase in bicycle volumes between the Future Baseline Condition and TOD Alternative A contributes to a significant impact.

Finding: Potentially significant

Cooke Street

Cooke Street is a critical north-south bicycle connection that provides direct access to the future HART Civic Center Station. This corridor currently accommodates up to 512 daily bicycle movements. Cooke Street is anticipated to exhibit a 48% increase in motor vehicle turn volumes at Pohukaina Street, which will increase bicycle exposure to turn conflicts. Because this is a key transit access route, there is an effective increase in bicycle conflicts, and there is a substantial projected increase in bicycle volumes (both due to demand for transit access and intra-district travel), Cooke Street's lack of dedicated bicycle facilities with a corresponding increase in bicycle volume between the Future Baseline Condition and TOD Alternative A contributes to a significant impact.

Finding: Potentially significant

Ward Avenue

Bisecting the project area, Ward Avenue is a key north-south bicycle connection that provides direct access to the future HART Kaka`ako Station and facilitates bicycle movement between the project area and areas mauka of the H1 freeway. This corridor currently accommodates up to 880 daily bicycle movements. Because this is a key transit access route, and there is a substantial projected increase in bicycle volumes between the Future Baseline Condition and TOD Alternative A (both due to demand for transit access and intra-district travel), Ward Avenue's lack of dedicated bicycle facilities is considered a significant impact.

Finding: Potentially significant

[2] Daily bicycle movements were extrapolated from AM and PM peak period (2-hour) bicycle counts.

Halekauwila Street

Although Halekauwila Street currently only accommodates up to 288 daily bicycle movements, this corridor will serve as a critical east-west bicycle connection. Given its alignment under the HART rail alignment, Halekauwila Street provides direct access to the future HART Civic Center, Kaka`ako, and Downtown Stations. Because this is a key transit access route, and there is a substantial projected increase in bicycle volumes between the Future Baseline Condition and TOD Alternative A (both due to demand for transit access and intra-district travel), Halekauwila Street's lack of dedicated bicycle facilities with a corresponding increase in bicycle volume between the Future Baseline Condition and TOD Alternative A contributes to a significant impact.

Finding: Potentially significant

Pensacola Street

Pensacola Street is a critical southbound bicycle connection at the Diamond Head edge of the project area. This corridor currently accommodates up to 288 daily bicycle movements. The projected increase in bicycle volumes along Pensacola Street between the Future Baseline Condition and TOD Alternative A is not supported by dedicated bicycle facilities. Pensacola Street is also a key bicycle access route to two future HART stations (Kaka`ako Station and Ala Moana Station) and Ala Moana Center for bicyclists originating from the Makiki neighborhood. Because this is a key transit access route, and there is a substantial projected increase in bicycle volumes between the Future Baseline Condition and TOD Alternative A (both due to demand for transit access and intra-district travel), Pensacola Street's lack of dedicated bicycle facilities is considered a significant impact.

The City and County has expressed interest in potentially converting the Pensacola-Piikoi one-way couplet into two-way operation while providing high quality bicycle facilities. This should be studied in the future.

Finding: Potentially significant

Piikoi Street

Piikoi Street is a critical northbound bicycle connection at the Diamond Head edge of the project area. This corridor currently accommodates up to 380 daily bicycle movements. Piikoi Street is anticipated to exhibit a 30% increase in motor vehicle turn volumes at Ala Moana Boulevard, which will increase bicycle exposure to turn conflicts. The projected increase in bicycle volumes along Piikoi Street between the Future Baseline Condition and TOD Alternative A is not supported by dedicated bicycle facilities. Piikoi Street is also provides bicycle egress from two future HART stations (Kaka`ako Station and Ala Moana Station) and Ala Moana Center, particularly for bicyclists destined for the Makiki neighborhood. Piikoi Street is anticipated to exhibit a 30% increase in motor vehicle turn volumes at Ala Moana Boulevard, which will increase bicycle exposure to turn conflicts. Because this is a key transit egress route, and there is a substantial projected increase in bicycle volumes between the Future Baseline Condition and TOD Alternative A (both due to demand for transit access and intra-district travel), Piikoi Street's lack of dedicated bicycle facilities is considered a significant impact.

The City and County has expressed interest in potentially converting the Pensacola-Piikoi one-way couplet into two-way operation while providing high quality bicycle facilities. This should be studied in the future.

Finding: Potentially significant

Additional Recommended Improvement (non-mitigation)

A bicycle and pedestrian crossing improvement at the King Street/Cooke Street intersection. is recommended as a potential *future* improvement measure. This would help link cyclists between the project area/Civic Center HART station and the Alapai Transit Center/Young Street signed and marked bike route (an east-west connection). This improvement is not recommended as a mitigation measure in this DEIS due to the location of the improvement relative to the project area.

4.6 PEDESTRIAN IMPACTS

Recommended Pedestrian Network Changes (Draft TOD Overlay Plan)

The pedestrian recommendations in the Draft TOD Overlay Plan seek to develop a high-quality pedestrian environment in the project area in order to achieve the goals of a lively, active, and transit-oriented community. Figure 47 illustrates where pedestrian investment is recommended as the district develops and the TOD Alternative A is realized. These recommended improvements are not stipulated as part of the TOD Alternative A as described in the Project Description. Thus, the recommendations in the Draft TOD Overlay Plan are only strategies and are not required improvements. The following sections summarize the impacts created as part of the TOD Alternative A and provide more targeted mitigation measures tied to the stated impacts.

The pedestrian priority types recommended in the Draft TOD Overlay Plan include:

- **Primary pedestrian priority streets** are those that connect key destinations in or adjacent to the district, including HART rail stations, and that will ultimately support active street front uses such as retail stores, public plazas, and entertainment venues. These streets require spacious sidewalks and a high level of pedestrian amenity.
- **Secondary pedestrian priority streets** are those that do not provide direct connections to major destinations or have very high traffic volumes. While these streets may never be ideal for walking along for long distances, they must still be safe enough to accommodate walking, and they should be easy and safe enough to cross that they do not serve as a barrier to pedestrians.
- **Low speed streets** are generally service streets that may have narrow widths and where pedestrians and traffic may even be asked to mix in a shared right-of-way. Note that the term "low speed streets" should not be interpreted to suggest that high-speeds are promoted anywhere in the project area.
- **Greenway connections** are streets where there is opportunity to connect parks, greenspace, and public plazas with well-landscaped, shaded, and interesting walking routes.

The following criteria were employed to develop the pedestrian priority network:

- ***Existing and anticipated pedestrian demand as a result of future redevelopment;***
- ***Key HART access streets for people walking to rapid transit stations;***

- ***Retail access or retail streets should prioritize pedestrian movement and create a welcoming environment to people walking to and between commercial/retail locations;***
- ***Locations where walking might be uncomfortable or where existing pedestrian infrastructure supply is inadequate for current or future demand.***

Other pedestrian network changes recommended in the Draft TOD Overlay Plan relate to conflict reduction, sidewalk expansion, and crossing distance reduction. Any street with on-street parking is proposed to include curb extensions at intersections. Driveway consolidation is proposed throughout the project area to reduce conflicts between motor vehicles and pedestrians and improve pedestrian safety. Building access is concentrated at smaller parking access or service streets in order to reduce search-for-parking traffic and eliminate conflicts with pedestrians. In addition, 5 feet of additional setback is recommended to achieve minimum 15 feet sidewalk widths. This is particularly critical in HART station areas, which will see an injection of pedestrian activity for at least 18 hours of the day. Mid-block crossings are also proposed to reduce some of the larger block sizes (those over 600-700 feet) and facilitate access to rail stations.

Figure 47 Recommended Pedestrian Network from the Draft TOD Overlay Plan

Note: Recommendations in the Draft TOD Overlay Plan are only strategies and not required improvements.

Summary Findings of Significance

The following list encapsulates the potential impacts that could be observed along pedestrian corridors throughout the project area. These impact types are based on the significance criteria listed in Section 1.3, the change in pedestrian crossings between the Future Baseline Condition and TOD Alternative A, and the ability of the Future Baseline Condition to connect an increase in pedestrians with existing and new destinations based on the Year 2035 Land Use Comparison. Potential impacts for each corridor include:

- Threefold increase in daily pedestrian crossings with no commensurate or appropriate increase in pedestrian capacity.
- Pedestrian delay with the increase in pedestrian volumes (over 80 seconds of delay is the threshold for pedestrians). Average delay for all travelers is increasing because as traffic disperses across the network away from overcapacity streets like Ala Moana Boulevard
- Prevalence of long crossing distances (depends on curb-to-curb width and underutilization of pavement space). Shorter crossing distances (achieved by limited intersection skew, corner radii, and/or availability of curb extensions) increase the effective pedestrian queuing capacity at intersection corners.
- Lack of pedestrian facilities to facilitate access to all three rail stations.
- Lack of adequate sidewalks to meet future pedestrian demand.

Compared to the Future Baseline Condition, the TOD Alternative A is expected to generate an additional 2,182 pedestrian crossings in the AM peak period and an additional 2,937 pedestrian crossings in the PM peak period. The increase in AM and PM peak period pedestrian crossings is summarized in Table 21.

Table 21 Pedestrian Volumes – TOD Alternative A

	Existing Condition (2015 Model Baseline)	Future Baseline Condition (2035 Model Baseline)	Future Baseline + TOD Alternative A (2035 TOD Overlay)	Future Baseline + TOD Alternative A (Percent Change over Existing)	TOD Alternative A (Percent Change over Future Baseline)
Daily	36,381	93,622	120,564	231%	29%
AM Peak Hour	2,946	7,583	9,765	231%	29%
PM Peak Hour	3,965	10,204	13,141	231%	29%

Pedestrian Impact Findings

The following corridors would exhibit impacts in both the TOD Alternative A and Future Baseline Condition based on one or more of the potential impacts listed in the section above. In each impacted corridor, a 331% increase in peak period pedestrian crossings (from existing pedestrian crossings to TOD Alternative A conditions) and a 129% increase in peak period pedestrian crossings (from Future Baseline Condition pedestrian crossings to TOD Alternative A conditions) with no corresponding increase in pedestrian capacity triggers a significant impact. Some impacts are demonstrated throughout the district or along multiple corridors. These types of impacts are aggregated into a general "All corridors" category.

All corridors (district-wide impacts)

A number of corridors throughout the project area exhibit a range of impacts stemming from the project area's increase in pedestrian activity between the Future Baseline Condition and TOD Alternative A. These include:

- A limited number of dedicated crosswalk facilities along each corridor funnels pedestrian volumes to a limited number of crossing locations (triggering a capacity impact) or encouraging crossing at unmarked intersections or at unmarked mid-block locations (triggering a safety impact due to reduced pedestrian visibility).
- Current crossing distances extend pedestrian's exposure time to motor vehicles (triggering a safety impact) and reduce the person throughput of cross walk facilities (i.e., short crossings exhibit greater pedestrian crossing capacity per pedestrian phase).
- The increase in pedestrian volumes between the Future Baseline Condition and TOD Alternative A will create some crowding issues on various commercial corridors with sidewalks widths less than 10 feet.

Finding: Each impact listed above is potentially significant

Central Kaka`ako industrial streets

Because of the industrial character of Central Kaka`ako, most streets in this neighborhood are not furnished with sidewalks or curbs. In addition, delivery trucks, cars, and mopeds are parked in different patterns and even double parked. The lack of adequate sidewalk facilities and haphazard parking arrangement creates conflicts with pedestrians and reduces the potential utility of several direct and relatively calm streets that could provide access to future HART stations. These conditions, coupled with an increase in pedestrian volumes, factors into triggering an impact on streets like:

- Waimanu Street
- Kawalahao Street
- Queen Street
- Hopaka Street
- Coral Street
- Kona Street
- Cummins Street
- Kamani Street
- Ilaniwai Street

HCDA has worked with the Central Kaka`ako community and determined that the industrial character of the area should remain. Curbless, shared street designs should be sought in order to reduce conflicts, create pockets of pedestrian space and ensure safe coexistence of street space between all users.

Finding: Potentially significant

Ala Moana Boulevard (signal timing improvements)

Intersections along Ala Moana experience substantial pedestrian delay for an urban district. For the purposes of this assessment, over 80 seconds of delay is considered the impact threshold for pedestrians. Using Ala Moana's intersection with Ward Avenue as an example, this intersection exhibits 140 second signal cycles—70 seconds to Ala Moana, 70 seconds to Ward. This cycle timing is inefficient and creates unacceptable delay. Pedestrians crossing Ala Moana are provided 35 seconds per pedestrian phase with 7 seconds of GREEN WALK time. With the projected increase in pedestrian volumes between the Future Baseline Condition and TOD Alternative A, unmitigated pedestrian delay can compound sidewalk and intersection queuing capacity issues. This constitutes an impact.

Finding: Potentially significant

Ala Moana Boulevard (pedestrian improvements)

Ala Moana is not a key HART station access route, but it serves as the most direct east-west pedestrian and bicycle connection between Kaka`ako and Waikiki. This corridor currently accommodates up to 215 and 269 pedestrian crossings in the AM and PM peaks, respectively.[3] This is anticipated to increase threefold between the Existing and TOD Alternative A timeframes. Crossings between the Future Baseline Condition and TOD Alternative A are projected to increase 29%.

The likelihood of sidewalk riding by bicyclists due to the current traffic conditions can increase pedestrians' exposure to collisions with bicycles. With the simultaneous increase in pedestrians and bicyclists using sidewalks (because of the lack of bicycle facilities along Ala Moana Boulevard), the increased number of conflicts between these two modes trigger a significant impact.

Finding: Potentially significant

[3] This equates to roughly 3,872 daily crossings.

MITIGATION MEASURES

Mitigation recommendations to mitigate the traffic, bicycle and pedestrian impacts described in the TOD Alternative A are described in this section. Not all impacts can be fully mitigated, resulting in identified significant and unavoidable impacts at a limited number of specific locations.

SUMMARY OF RECOMMENDED TRANSPORTATION MITIGATIONS

Traffic Mitigations

Table 22 summarizes the potential traffic impacts, based on the findings of the analysis of the TOD Alternative A, and describes recommended mitigation measures.

Transit Mitigations

Impacts to transit capacity and operations resulting from the Project were found to be less than significant. Therefore, no transit mitigations are required.

Bicycle Mitigations

Table 23 on page 101 summarizes the significant, yet avoidable bicycle impacts for the Future Baseline Condition and TOD Alternative A with their corresponding mitigation measures.

Pedestrian Mitigations

Table 24 on page 102 summarizes the significant, yet avoidable pedestrian impacts for the Future Baseline Condition and TOD Alternative A with their corresponding mitigation measures.

Table 22 Motor Vehicle Traffic Mitigations

Impacted Locations	Proposed Motor Vehicle Mitigation			Impact Finding with Mitigation	
	Impact Finding	Potential Mitigation	Secondary Impact of Mitigation	Level of Significance with Mitigation	Recommendation
Ala Moana & South	LOS F under Future Baseline Condition. TOD Alternative A would increase V/C.	Increase allocation of green time per cycle to Ala Moana.	Increased delay to side-street motorists, bicyclists and pedestrians.	Intersection remains at LOS F due to side-street delay.	Trip reduction mitigation to achieve 9% reduction in PM Peak Hour Traffic Volume (below model-forecasted volumes).
Ala Moana & Cooke					
Ala Moana & Ward	LOS F under Future Baseline Condition. TOD Alternative A would increase V/C.	Restripe north/south approaches to eliminate split signal phases. Reduce length of east-leg pedestrian crossing.	On east-leg only: would require wider curb-to-curb width.	Intersection remains at LOS F due to side-street delay.	
Queen & Ward	LOS F under Future Baseline Condition. Identified as significant and unavoidable in 2009 Kaka`ako Mauka Plan SEIS.	N/A	N/A	N/A	N/A
Kapiolani & Ward	LOS F under Future Baseline Condition. Identified as significant and unavoidable in 2009 Kaka`ako Mauka Plan SEIS.	N/A	N/A	N/A	N/A

Table 23 Bicycle Mitigations

Impacted Corridors	Proposed Bicycle Mitigation			Impact Finding with Mitigation	
	Impact Finding	Mitigation	Secondary Impact	Bicycle Impact	Secondary Impact
Punchbowl Street	Potentially significant due to forecasted increase in bicycle volume and lack of bicycle capacity.	Restripe with bollard-protected bike lane.	N/A – bicycle lane can be accommodated with restriping.	Less than significant.	N/A
South Street		Restripe with bollard-protected bike lane.	Removal of on-street parking on one side.	Less than significant.	Less than significant – no reduction in traffic lane capacity.
Cooke Street		Restripe with 3 lanes and bike lanes	Removal of one motor vehicle travel lane.	Less than significant.	Less than significant – traffic LOS would remain acceptable.
Ward Avenue		Install bicycle lanes.	Removal of on-street parking.	Less than significant.	Less than significant – no reduction in traffic lane capacity.
Pensacola Street		Restripe with bike lane; study potential two-way conversion with 3 lanes and bike lanes	N/A – bicycle lane can be accommodated with restriping.	N/A	N/A
Piikoi Street*		Restripe with bollard-protected bike lane; study potential two-way conversion with 3 lanes and bike lanes	Bicycle lane can be accommodated with restriping. Potential impact from bollard.	N/A	N/A
Halekauwila Street		Construct cycle track or stripe bike lanes; cycle track alignment and design is contingent on the final design and location of HART guideway columns.	Removal of on-street parking.	N/A	N/A

Table 24 Pedestrian Mitigations

Impacted Pedestrian Corridors (impact type)	Proposed Pedestrian Mitigation			Impact Finding With Mitigation	
	Impact Finding	Mitigation	Secondary Impact	Pedestrian Impact	Secondary Impact
All corridors (long crossing distances)	Potentially significant	Construct curb extensions at all intersections with on-street parking and that have 24' curb-to-curb walk distances of minor streets or 26' curb-to-curb walk distances of major streets; Reduce intersection skew; Tighten intersection geometry; Construct pedestrian refuge islands (Each mitigation measure requires further study)	Curb extensions may remove a small amount of on-street parking and reduce shy distance from parking and the curb face.	Less than significant with mitigation	Less than significant
All corridors (capacity issues due to change in pedestrian activity)	Potentially significant	Require redevelopment setbacks that ensure a minimum 15' pedestrian realm (sidewalk plus buffer including furniture zone and landscaping) regardless of existing pedestrian realm width. If the existing pedestrian realm is greater than 15', then there is no significant impact.	N/A	Less than significant with mitigation	Less than significant
Central Kaka`ako industrial streets	Potentially significant	Reconstruct streets as shared industrial streets while maintaining delivery and parking storage functions Example of a shared street	Potential impact to parking supply.	Less than significant with mitigation	Less than significant
Ala Moana Boulevard (signal timing improvements)	Potentially significant	Reduce Ala Moana signal cycle lengths to 120 seconds and couple with other signal optimization features; this will create more lane capacity (from 800vph to 1200vph)	Reduces minor street signal phase by 20 seconds. Potential impact to vehicle turn storage, including deliveries.	Less than significant with mitigation	Less than significant
Ala Moana Boulevard (pedestrian improvements)	Potentially significant.	Construct makai side shared use path	Potential impact to pedestrians on makai side.	Less than significant with mitigation	Less than significant if adequate pedestrian path is maintained

MITIGATION CROSS SECTIONS

Figures 48 to 55 illustrate the proposed changes to streets with recommended mitigation measures for the TOD Alternative A. Streets with varying sidewalk widths are illustrated with ranges. All cross sections are conceptual and would require further engineering study prior to implementation.

Figure 48 Proposed Bicycle Mitigation: Cooke Street (Cross-section Drawing)

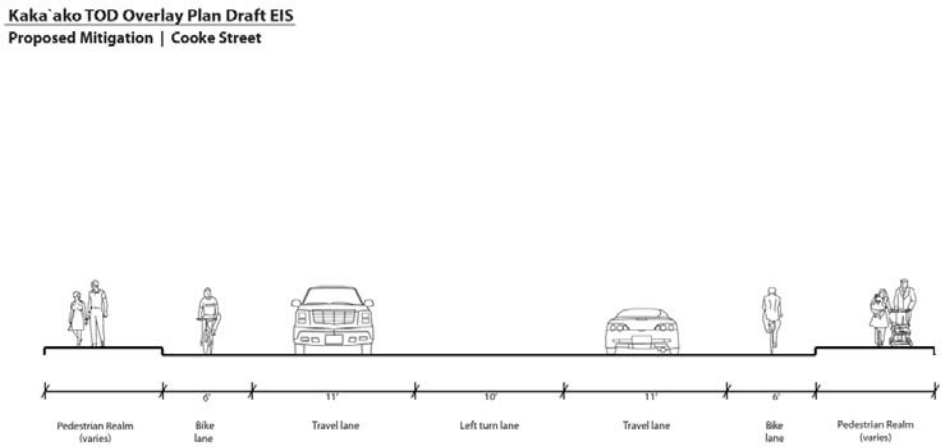
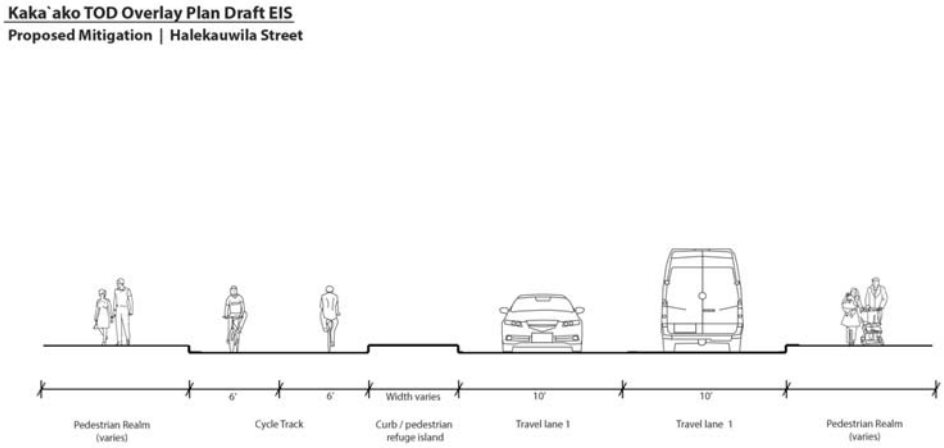


Figure 49 Proposed Bicycle Mitigation: Halekauwila Street (Cross-section Drawing)



Note: Cycle track alignment and design may depend on the final design and location of HART guideway columns. If a center-running guideway design is selected along Halekauwila, the colum widths could maintain the cycle track separation and maintain a large amount of on-street parking.

Figure 50 Proposed Bicycle Mitigation: Punchbowl Street (Cross-section Drawing)

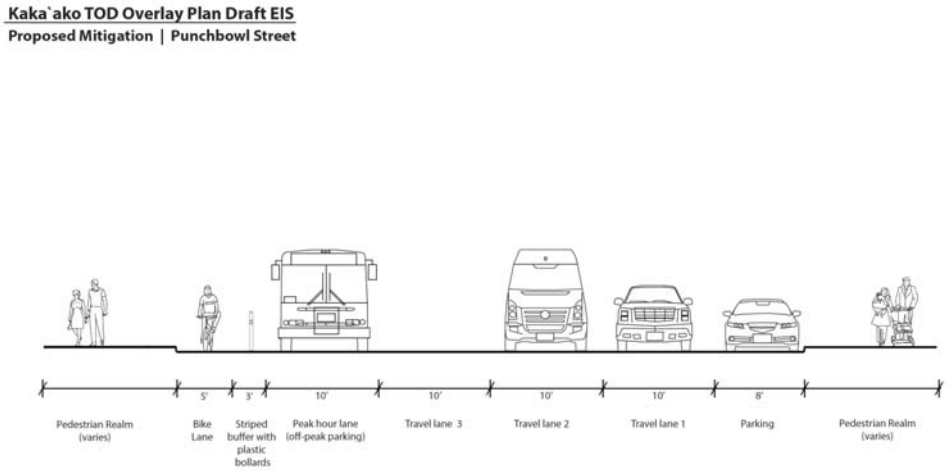


Figure 51 Proposed Bicycle Mitigation: South Street (Cross-section Drawing)

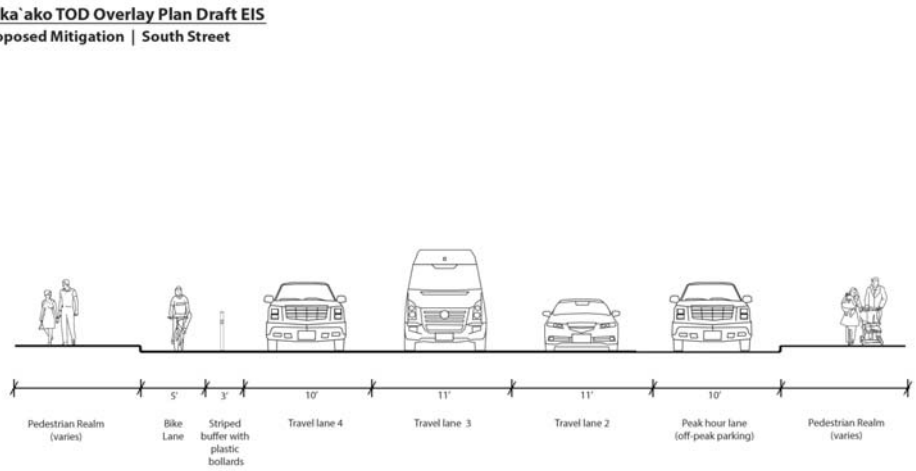


Figure 52 Proposed Bicycle Mitigation: Ward Avenue (Cross-section Drawing)

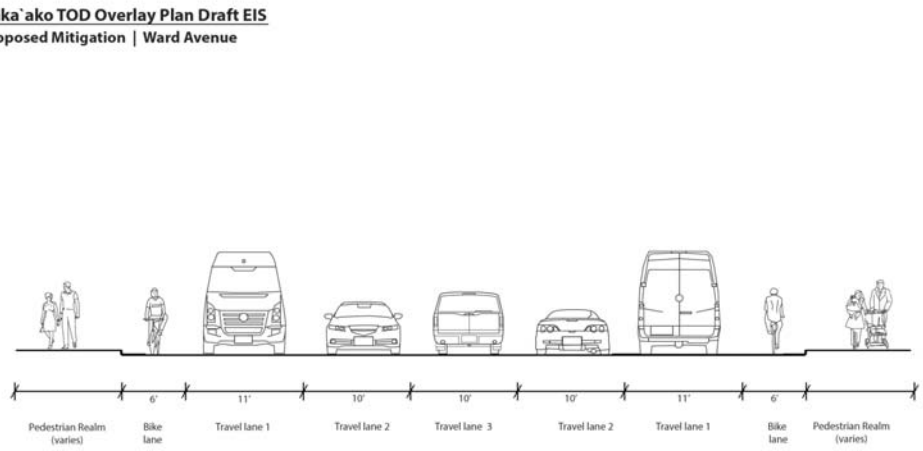


Figure 53 Proposed Bicycle Mitigation: Pensacola Street (Cross-section Drawing)

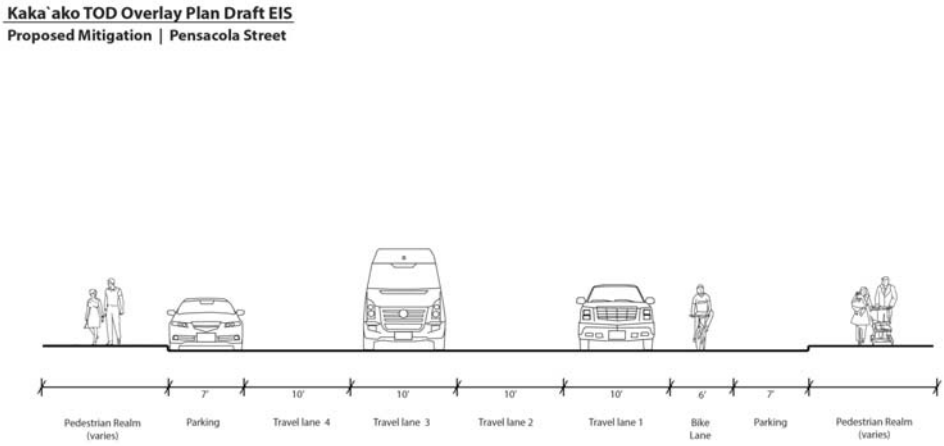
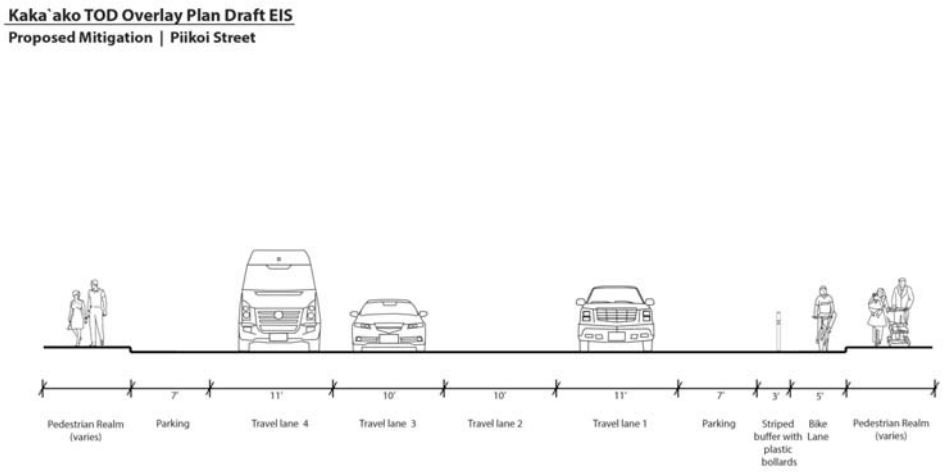


Figure 54 Proposed Bicycle Mitigation: Piikoi Street (Cross-section Drawing)



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[iv] Marshall, Norm. Kaka'ako summary statistics and turning movements. (August 23, 2013)

[v] United States Census Bureau, American Community Service 5-year Estimate, S0801, Census Tracts 37, 38 & 39.

[vi] Wiltec, Inc., Intersection Counts at 48 Study Intersections. (January 15-17, 2013)

Kakaako Community Development District TOD Overlay Plan | FEIS Transportation Analysis
Hawaii Community Development Authority

Figure 55 Proposed Pedestrian Mitigation: Ala Moana Boulevard (Cross-section Drawing)

Kaka'ako TOD Overlay Plan Draft EIS
Proposed Mitigation | Ala Moana Boulevard

Appendix E:
Noise Impact Analysis

ACOUSTIC STUDY FOR THE TRANSIT-ORIENTED DEVELOPMENT PROJECT KAKA`AKO COMMUNITY DEVELOPMENT DISTRICT AND ALOHA TOWER SPECIAL DISTRICT OAHU, HAWAII

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SEPTEMBER 2014

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CHAPTER I. SUMMARY

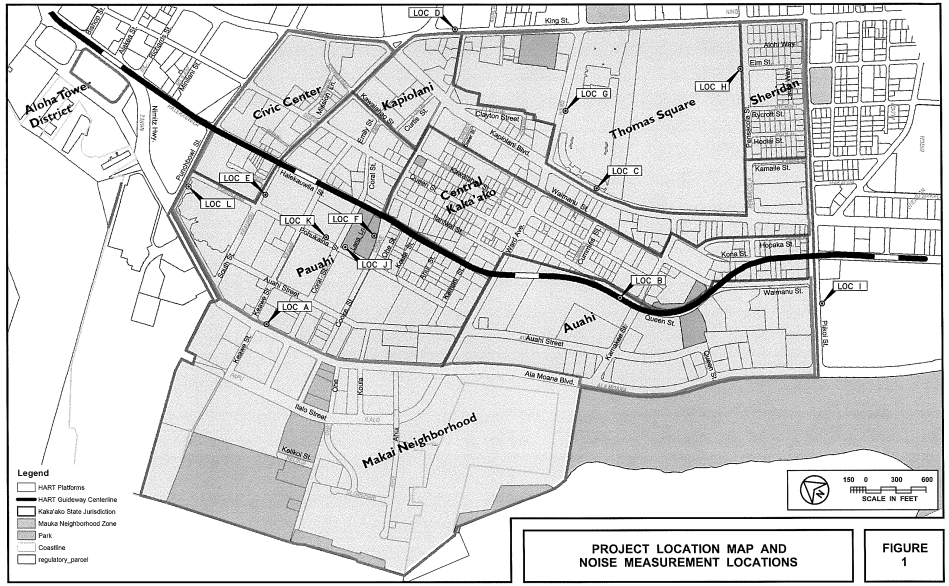
The existing and future traffic noise levels in the vicinity of the proposed Transit-Oriented Development (TOD) project for the Kaka`ako Community Development District (KCDD) and Aloha Tower Special District (ATSD) were evaluated for their potential impacts and their relationship to current FHA/HUD (Federal Housing Administration/Housing and Urban Development) noise standards. The traffic noise level increases, including the contributions of noise from the elevated transit (rail) system in the study area (see Figure 1) were calculated. No significant traffic noise impacts are predicted to occur as a result of the TOD plan by CY 2035.

Along the major roadways in the study area (King Street, Kapiolani Boulevard, Ala Moana Boulevard, Nimitz Highway, Ward Avenue, Piikoi Street, Cooke Street, and South Street), traffic noise levels are expected to remain above the 65 DNL (Day-Night Sound Level) FHA/HUD standard at 50 foot distance from the roadways' centerlines in CY 2035. Increases in future traffic noise levels associated with the TOD plan are typically less than 1.0 DNL. In a few cases (Ala Moana Boulevard, Kamakee Street, Cooke Street, and Piikoi Street) project traffic will add between 1.l and 3.4 additional DNL units of noise to those streets. Overall, the traffic noise level increases resulting from project generated traffic are not considered to be significant. The predicted increases in traffic noise levels are not expected to generate adverse noise impacts by CY 2035.

The planned elevated transit (rail) system will cross through the center of the study area where existing and future traffic noise levels are relatively low. The rail system is expected to reduce the increases in future project and non-project motor vehicle traffic noise levels, but will add a corridor of relatively high noise levels near the center of the study area. A buffer distance of approximately 192 to 200 feet from the center of the rail system will probably be required to minimize the risks of exceeding the 65 DNL noise standard as a result of the combined contributions from both rail and motor vehicle traffic noise.

Unavoidable, but temporary, noise impacts may occur during construction activities, and particularly during the excavation and potential pile driving activities within the study area. Because construction activities are predicted to be audible within the study area and at adjoining properties, the quality of the acoustic environment may be degraded to unacceptable levels during periods of construction. Mitigation measures to reduce construction noise to inaudible levels will not be practical in all cases, but the use of quiet equipment and the adherence to Hawaii State Department of Health noise permit requirements are recommended as standard mitigation measures.

Because of the presence of low, mid-rise, and high-rise buildings throughout the study area and the potential for damage to these buildings from vibration during potential pile driving operations, vibration monitoring is recommended during close-in



PROJECT LOCATION MAP AND NOISE MEASUREMENT LOCATIONS

FIGURE 1

pile driving operations where vibration levels are expected to exceed 0.2 inches/second. In addition, it is expected that the design and construction methods for new buildings in the study area will be optimized to minimize risks of damage to adjacent structures from settling or heaving. A vibration limit of 2.0 inches/second should not be exceeded at any of the adjacent buildings, and modifications to a project's plans prior to design and construction are recommended if these limits are expected to be exceeded.

CHAPTER II. PURPOSE

The primary objective of this study was to describe the existing and future traffic noise environment in the environs of the proposed Transit-Oriented Development (TOD) Project within the Kaka`ako Community Development District (KCDD) and the Aloha Tower Special District (ATSD) on the island of Oahu. Traffic forecasts for both the Baseline Condition and for the TOD Alternative A in 2035 were used. Traffic noise level increases and impacts associated with the TOD Alternative A (referred to as Alternative A) were to be determined within the project area as well as along the public roadways which are expected to service the project area. A specific objective was to determine future traffic noise level increases associated with both project and non-project traffic, and the potential noise impacts associated with these increases.

The potential noise impacts from TOD Alternative B were not examined in depth, but are expected to be similar to or slightly less than the potential noise impacts from TOD Alternative A. This is because the density of TOD Alternative B is expected to be 90 percent of the density of TOD Alternative A. Therefore, the potential noise impacts described in this report represent the worst case situation anticipated in 2035.

Evaluation of impacts from short term construction noise and vibration in the project environs were also included as noise study objectives. Specifically, the potential risks of structural damage to adjacent buildings from pile driving operations on the project site were included in the noise and vibration impact assessment. Recommendations for minimizing identified noise and vibration impacts were also to be provided as required.

CHAPTER III. NOISE DESCRIPTORS AND THEIR RELATIONSHIP TO LAND USE COMPATIBILITY

The noise descriptor currently used by federal agencies (such as FHA/HUD) to assess environmental noise is the Day-Night Average Sound Level (Ldn or DNL). This descriptor incorporates a 24-hour average of instantaneous A-Weighted Sound Levels as read on a standard Sound Level Meter. By definition, the minimum averaging period for the DNL descriptor is 24 hours. Additionally, sound levels which occur during the nighttime hours of 10:00 PM to 7:00 AM are increased by 10 decibels (dB) prior to computing the 24-hour average by the DNL descriptor. A more complete list of noise descriptors is provided in Appendix B to this report.

Table 1, derived from Reference 1, presents current federal noise standards and acceptability criteria for residential land uses. Land use compatibility guidelines for various levels of environmental noise as measured by the DNL descriptor system are shown in Figure 2. As a general rule, noise levels of 55 DNL or less occur in rural areas, or in areas which are removed from high volume roadways. In urbanized areas which are shielded from high volume streets, DNL levels generally range from 55 to 65 DNL, and are usually controlled by motor vehicle traffic noise. Residences which front major roadways are generally exposed to levels of 65 DNL, and as high as 75 DNL when the roadway is a high speed freeway. In the project area, traffic noise levels associated with Nimitz Highway, Ala Moana Boulevard, Kapiolani Boulevard, King Street, Ward Avenue, Piikoi Street, Punchbowl Street, Pensacola Street, South Street, and Cooke Street are typically greater than 65 DNL along their Rights-of-Way due to the large volumes of traffic on those major thoroughfares.

For purposes of determining noise acceptability for funding assistance from federal agencies (FHA/HUD and VA), an exterior noise level of 65 DNL or less is considered acceptable for noise sensitive properties. This standard is applied nationally (Reference 2), including Hawaii. Because of our open-living conditions, the predominant use of naturally ventilated dwellings, and the relatively low exterior-to-interior sound attenuation afforded by these naturally ventilated structures, an exterior noise level of 65 DNL does not eliminate all risks of noise impacts. Because of these factors, and as recommended in Reference 3, a lower level of 55 DNL is considered to be the "Unconditionally Acceptable" (or "Near-Zero Risk") level of exterior noise. However, after considering the cost and feasibility of applying the lower level of 55 DNL, government agencies such as FHA/HUD and VA have selected 65 DNL as a more appropriate regulatory standard.

For commercial, industrial, and other non-noise sensitive land uses, exterior noise levels as high as 75 DNL are generally considered acceptable. Exceptions to this occur when naturally ventilated office and other commercial establishments are exposed to exterior levels which exceed 65 DNL.

On the island of Oahu, the State Department of Health (DOH) regulates noise from construction activities through the issuance of permits for allowing excessive

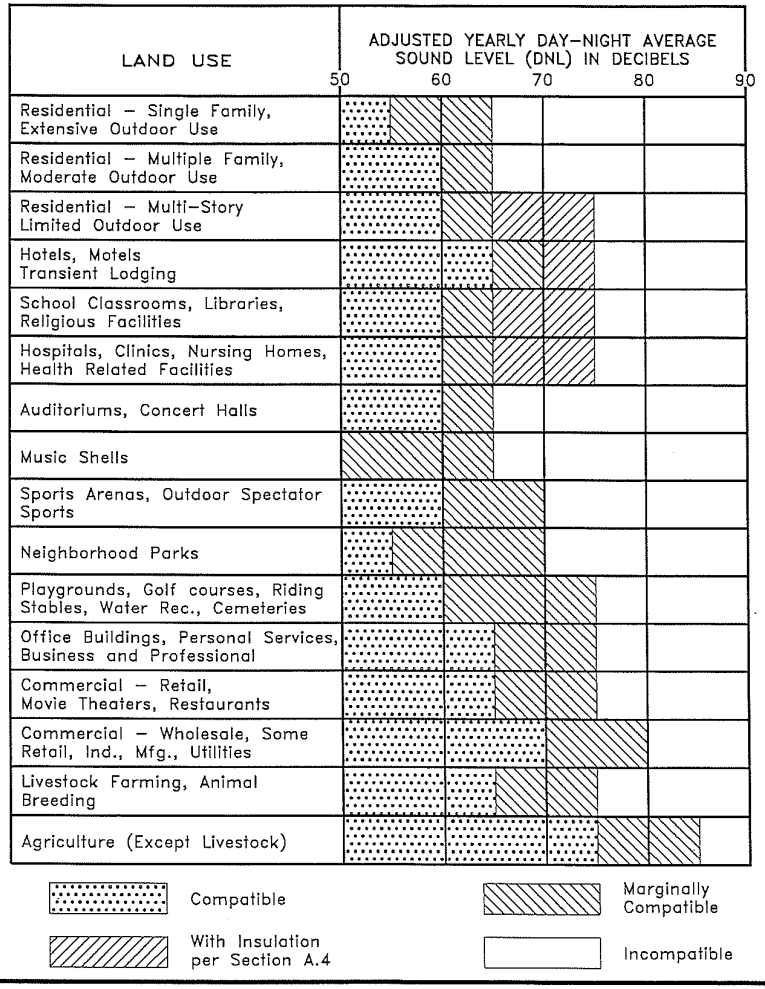
TABLE 1

EXTERIOR NOISE EXPOSURE CLASSIFICATION (RESIDENTIAL LAND USE)

NOISE EXPOSURE CLASS	DAY–NIGHT SOUND LEVEL	EQUIVALENT SOUND LEVEL	FEDERAL (1) STANDARD
Minimal Exposure	Not Exceeding 55 DNL	Not Exceeding 55 Leq	Unconditionally Acceptable
Moderate Exposure	Above 55 DNL But Not Above 65 DNL	Above 55 Leq But Not Above 65 Leq	Acceptable(2)
Significant Exposure	Above 65 DNL But Not Above 75 DNL	Above 65 Leq But Not Above 75 Leq	Normally Unacceptable
Severe Exposure	Above 75 DNL	Above 75 Leq	Unacceptable

Notes: (1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

(2) FHWA uses the Leq instead of the Ldn descriptor. For planning purposes, both are equivalent if: (a) heavy trucks do not exceed 10 percent of total traffic flow in vehicles per 24 hours, and (b) traffic between 10:00 PM and 7:00 AM does not exceed 15 percent of average daily traffic flow in vehicles per 24 hours. The noise mitigation threshold used by FHWA for residences is 67 Leq.



LAND USE COMPATIBILITY WITH YEARLY AVERAGE DAY–NIGHT AVERAGE SOUND LEVEL (DNL) AT A SITE FOR BUILDINGS AS COMMONLY CONSTRUCTED.
(Source: American National Standards Institute S12.9–1998/Part 5)

FIGURE 2

noise during limited time periods. State DOH noise regulations are expressed in maximum allowable property line noise limits rather than DNL (see Reference 4). Although they are not directly comparable to noise criteria expressed in DNL, State DOH noise limits for residential, commercial, and industrial lands equate to approximately 55, 60, and 76 DNL, respectively. The State of Hawaii Hawaii Community Development Authority (HCDA) has established property line noise limits for the KCDD depending on the emphasis placed by their multiuse zoning districts. Although they are not directly comparable to noise criteria expressed in DNL, HCDA noise limits for residential, commercial, and waterfront industrial lands equate to approximately 60, 60, and 70 DNL, respectively.

It should be noted that the noise compatibility guidelines and relationships to the DNL noise descriptor may not be applicable to impulsive noise sources such as pile drivers. The use of penalty factors (such as adding 10 dB to measured sound levels or the use of C-Weighting filters) have been proposed. However, the relationships between levels of impulsive noise sources and land use compatibility have not been as firmly established as have the relationships for non-impulsive sources. The State DOH limits for impulsive sounds which exceed 120 impulses in any 20 minute period are 10 dB above the limits for non-impulsive sounds. If impulsive sounds do not exceed 120 impulses in any 20 minute time period, there are no regulatory limits on their sound levels under the State DOH regulations.

CHAPTER IV. GENERAL STUDY METHODOLOGY

Existing traffic noise levels were measured at twelve locations (A through L) in the project environs to provide a basis for developing the project's traffic noise contributions along the roadways which will service the project area. The locations of the measurement sites are shown in Figure 1. Traffic noise measurements were performed between the end of 2012 through 2013. The results of the traffic noise measurements were compared with calculations of existing traffic noise levels to validate the computer model used. The traffic noise measurement results, and their comparisons with computer model predictions of existing traffic noise levels are summarized in Table 2.

Traffic noise calculations for the existing conditions as well as noise predictions for 2035 were performed using the Federal Highway Administration (FHWA) Traffic Noise Model (Reference 5). Traffic data entered into the noise prediction model were: roadway and receiver locations; hourly traffic volumes, average vehicle speeds; estimates of traffic mix; and "Pavement" propagation loss factor. The traffic data and forecasts for the project (Reference 6), plus the spot traffic counts obtained during the noise measurement periods were the primary sources of data inputs to the model. Appendix C summarizes the AM and PM peak hour traffic volumes for CY 2013 and 2035, which were used to model existing and future traffic noise along the streets in the study area. Year 2011 and 2012 traffic data along the roadways in the project environs from References 7 through 32 were used to model existing and future traffic noise levels along the roadways in the project environs. For existing and future traffic along the roadways in the project environs, the relationships between the 24-hour DNL and the AM or PM peak hour Leq(h)'s were derived from References 7 through 32 and were assumed to be as shown in Table 3. The Leq(h) to DNL conversion factors for the high volume roadways were obtained from calculations of traffic noise levels using the 24-hour traffic counts provided in References 7 through 32. Examples of the results of these calculations are shown in Figures 3 through 9.

Traffic noise calculations for both the existing and future conditions in the project environs were developed for ground level and elevated receptors. Traffic noise levels were also calculated for future conditions with and without the proposed project. The anticipated noise levels from the planned elevated light rail system were included in the forecasts of future noise levels in the project environs with and without the proposed KCDD/ATSD development plan. The forecasted changes in total (road traffic plus rail) noise levels over existing levels were calculated with and without the project, and noise impact risks evaluated. References 33 and 34 were used to develop the anticipated noise contributions from the elevated light rail system within the KCDD/ATSD study area. The relative contributions of non-project and project traffic to the total noise levels were also calculated, and an evaluation of possible traffic noise impacts was made.

Calculations of average exterior and interior noise levels from construction

TABLE 2

TRAFFIC AND BACKGROUND NOISE MEASUREMENT RESULTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	Hourly Traffic Volume AUTO	M.TRUCK	H.TRUCK	Measured Leq (dB)	Predicted Leq (dB)
A. 50 FT from the center-line of Ala Moana Blvd. (12/7/12)	0700 TO 0800	36	3,732	105	121	73.4	73.3
A. 50 FT from the center-line of Ala Moana Blvd. (12/7/12)	1600 TO 1700	30	3,965	46	88	71.3	71.4
B. 50 FT from the center-line of Queen St. (1/11/13)	0700 TO 0800	30	569	10	12	61.7	61.5
B. 50 FT from the center-line of Queen St. (1/11/13)	1430 TO 1530	29	1,034	9	9	62.9	62.9
C. 50 FT from the center-line of Kapiolani Blvd. (12/7/12)	0830 TO 0930	34	1,848	25	62	68.9	69.0
C. 50 FT from the center-line of Kapiolani Blvd. (12/7/12)	1430 TO 1530	30	2,699	29	58	69.1	69.0
D. 50 FT from the center-line of King St. (12/12/12)	0751 TO 0851	40	1,482	25	52	70.1	70.0

TABLE 2 (CONTINUED)

TRAFFIC AND BACKGROUND NOISE MEASUREMENT RESULTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	Hourly Traffic Volume AUTO	M.TRUCK	H.TRUCK	Measured Leq (dB)	Predicted Leq (dB)
D. 50 FT from the center-line of King St. (12/12/12)	1551 TO 1651	39	2,344	20	80	71.6	71.7
E. 50 FT from the center-line of South St. (1/9/13)	0830 TO 0930	36	427	14	10	62.6	62.6
E. 50 FT from the center-line of South St. (12/5/12)	1600 TO 1700	31	789	13	23	64.0	64.1
F. 50 FT from the center-line of Cooke St. (1/9/13)	0700 TO 0800	35	521	14	2	62.6	62.4
F. 50 FT from the center-line of Cooke St. (12/5/12)	1430 TO 1530	36	607	28	8	64.2	64.2
G. 50 FT from the center-line of Ward Ave. (12/19/12)	0700 TO 0800	41	1,267	24	14	68.0	68.0
G. 50 FT from the center-line of Ward Ave. (12/12/12)	1430 TO 1530	36	1,809	24	10	68.1	68.0

TABLE 2 (CONTINUED)

TRAFFIC AND BACKGROUND NOISE MEASUREMENT RESULTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	Hourly Traffic Volume AUTO	M.TRUCK	H.TRUCK	Measured Leq (dB)	Predicted Leq (dB)
H. 50 FT from the center-line of Pensacola St. (12/19/12)	0830 TO 0930	30	1,327	13	13	64.6	64.6
H. 50 FT from the center-line of Pensacola St. (1/9/13)	1600 TO 1700	30	1,250	9	11	64.0	64.1
I. 69 FT from the center-line of Piikoi St. (1/11/13)	0830 TO 0930	30	991	31	64	65.7	65.8
I. 69 FT from the center-line of Piikoi St. (1/9/13)	1430 TO 1530	30	1,383	11	87	66.5	66.6
J. 50 FT from the center-line of Pohukaina St. (1/23/13)	0700 TO 0800	25	473	11	7	59.5	59.4
K. 50 FT from the center-line of Pohukaina St. (1/25/13)	1600 TO 1700	35	419	0	8	61.2	61.1
L. 50 FT from the center-line of Punchbowl St. (10/23/13)	0800 TO 0900	37	490	4	19	63.8	63.9

TABLE 2 (CONTINUED)

TRAFFIC AND BACKGROUND NOISE MEASUREMENT RESULTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	Hourly Traffic Volume AUTO	M.TRUCK	H.TRUCK	Measured Leq (dB)	Predicted Leq (dB)
L. 50 FT from the center-line of Punchbowl St. (10/22/13)	1600 TO 1700	30	631	6	13	62.1	62.1

TABLE 3
RELATIONSHIPS BETWEEN 24-HOUR DNL AND PEAK HOUR LEQ(H)

ROADWAY	PEAK TRAFFIC HOUR	DNL MINUS PEAK LEQ(H)
Nimitz Highway	AM	0.7
Ala Moana Boulevard	PM	0.3
Kapiolani Boulevard	AM/PM	0.1
King Street	AM/PM	-0.3
Punchbowl Street	AM	-0.4
Ward Avenue	AM/PM	1.3
Pensacola Street	PM	0.0
Piikoi Street	AM/PM	1.5
South Street	AM/PM	0.0 (Est.)
Keawe Street	PM	0.0 (Est.)
Cooke Street	AM/PM	0.0 (Est.)
Kamakee Street	AM/PM	0.0 (Est.)
Auahi Street	AM/PM	0.0 (Est.)
Pohukaina Street	AM/PM	0.0 (Est.)
Halekauwila Street	PM	0.0 (Est.)
Queen Street	PM	0.0 (Est.)
Waimanu Street	AM/PM	0.0 (Est.)
Ilalo Street	PM	0.0 (Est.)

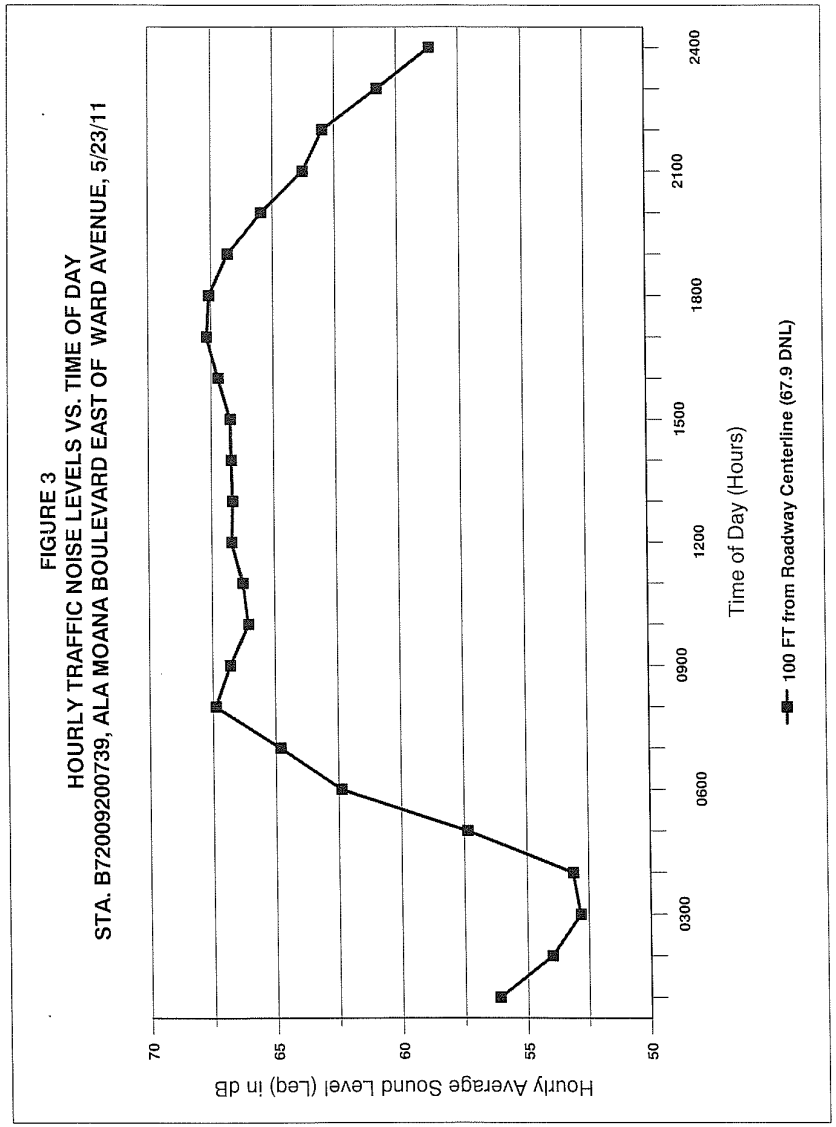


FIGURE 4
HOURLY TRAFFIC NOISE LEVELS VS. TIME OF DAY
STA. B72750300000, KAPIOLANI BOULEVARD BETWEEN SOUTH ST. AND WARD AVE., 2/22/12

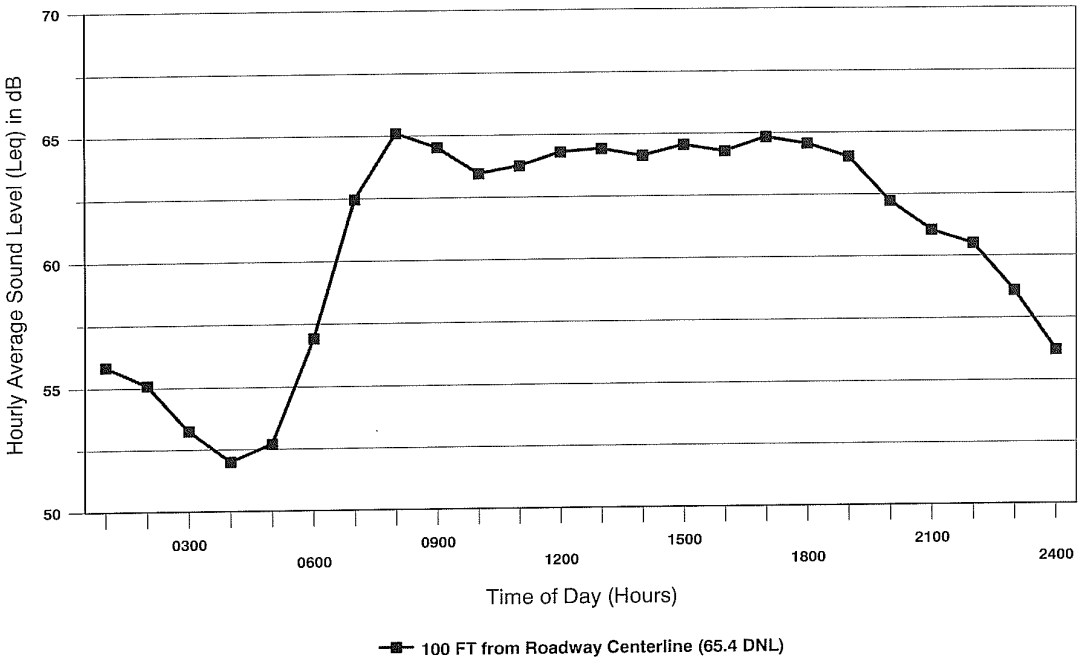


FIGURE 5
HOURLY TRAFFIC NOISE LEVELS VS. TIME OF DAY
STA. B72740200240, KING STREET BETWEEN VICTORIA ST. AND PENSACOLA ST., 5/12/11

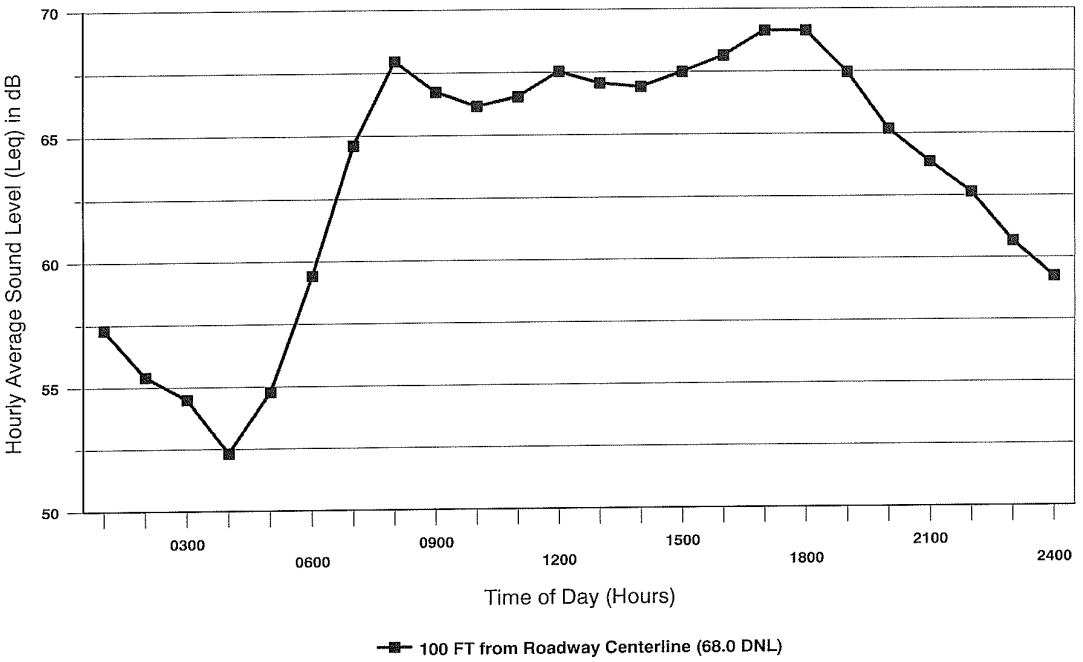


FIGURE 6
HOURLY TRAFFIC NOISE LEVELS VS. TIME OF DAY
STA. B72751600079, PUNCHBOWL STREET BETWEEN HALEKAUWILA ST. AND ALA MOANA BLVD., 1/20/11

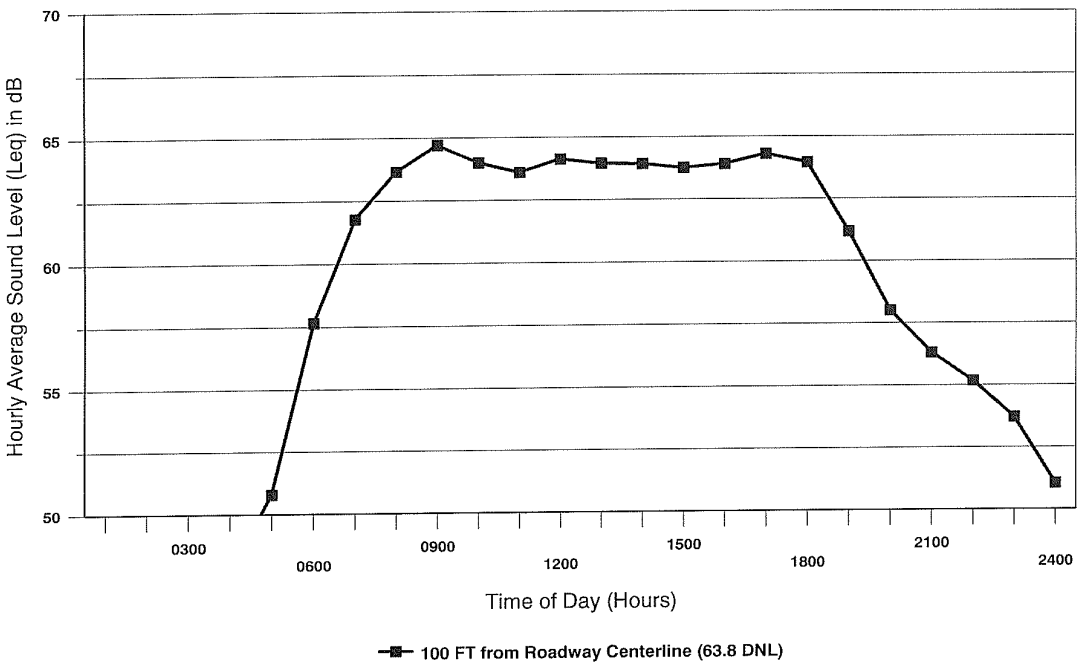


FIGURE 7
HOURLY TRAFFIC NOISE LEVELS VS. TIME OF DAY
STA. B72751100042, WARD AVENUE BETWEEN KAPIOLANI BLVD. AND KING ST., 2/29/12

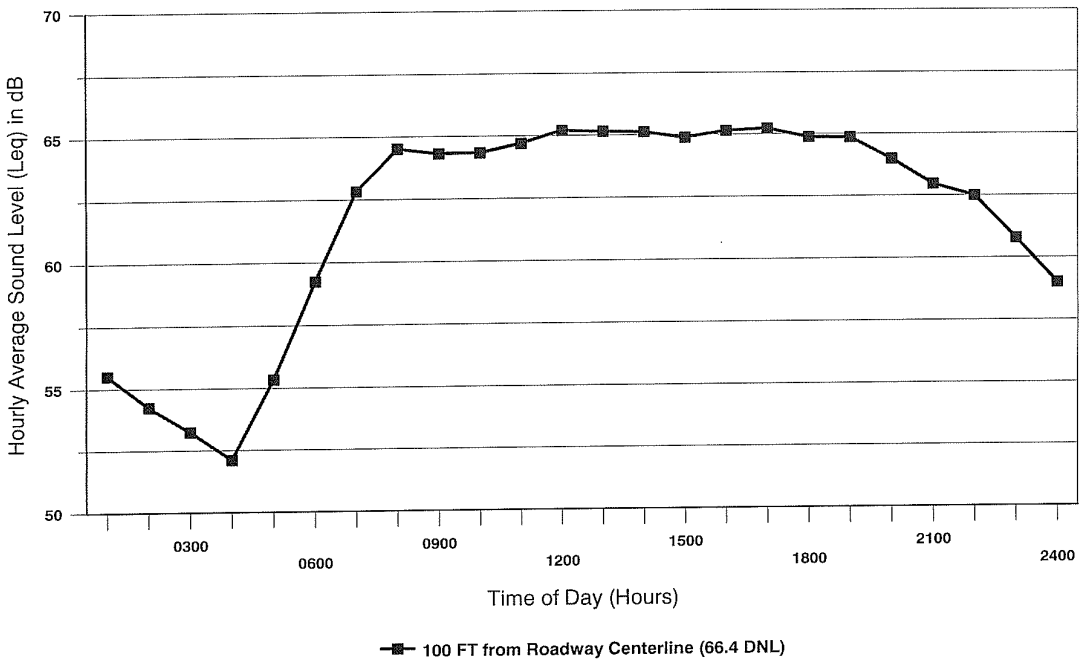


FIGURE 8
HOURLY TRAFFIC NOISE LEVELS VS. TIME OF DAY
STA. B72751200080, PENSACOLA STREET BETWEEN KAMAILE ST. AND HOOLAI ST., 4/6/11

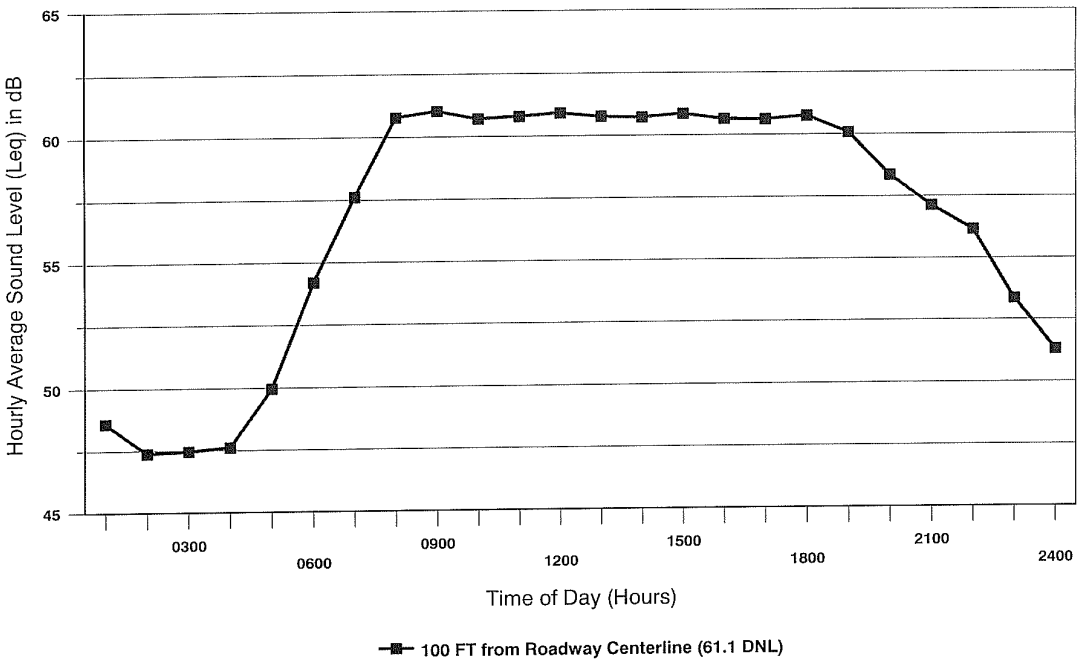
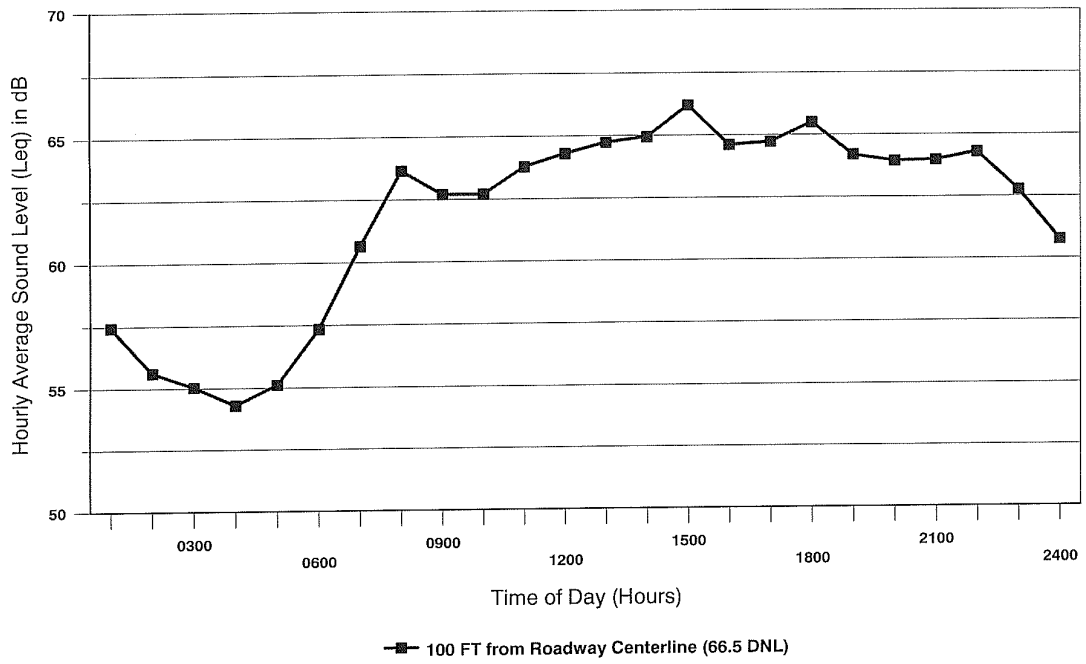


FIGURE 9
HOURLY TRAFFIC NOISE LEVELS VS. TIME OF DAY
STA. B72751300027, PIIKOI STREET BETWEEN KAPIOLANI BLVD. AND KING ST., 2/11/11



activities were performed for typical naturally ventilated and air conditioned dwellings. Predicted noise levels were compared with existing background ambient noise levels, and the potential for noise impacts was assessed. Potential noise and vibration impacts from pile driving operations were also discussed, and mitigation measures recommended.

V. EXISTING ACOUSTICAL ENVIRONMENT

The existing background ambient noise levels within the project area are dependent upon receptor location relative to the high volume roadways, receptor elevation, and spatial relationships to fixed noise sources in the vicinity of the receptor. At ground level, traffic noise from streets within visual line of sight to the receptor will tend to control the residual background noise level. Because of the wide range (74 to 57 DNL) of traffic noise from the high to low volume streets in the project area, the residual background noise levels at ground level receptors also exhibit this wide range. At the higher elevations over the project area, the visual lines of sight to the more distant and high volume streets increase, so residual background noise levels due to traffic noise may be higher at the higher elevations than at the lower elevations. In addition, at the higher elevations, the visual lines of sight to rooftop air conditioning or ventilation equipment could cause total background noise levels to be higher at elevated receptor locations. This is the result of decreased noise shielding effects by existing buildings as the receptor elevations increase at a given location within the study area.

At receptor locations with visual lines of sight to the high volume roadways, the hourly variations in traffic noise levels will be similar to those shown in Figures 3 through 9. Receptors which are shielded from these high volume streets will experience similar variations in hourly traffic noise levels, but the overall levels will be much lower (by 8 to 16 dBA) than those shown in Figures 3 through 9. Residual background noise levels (or the noise levels during periods of no traffic flow on the closest roadway) are controlled by distant traffic, operating machinery, landscaping equipment, construction equipment, voices, and the natural sounds of birds and foliage moving with the wind. Residual daytime background noise levels are typically higher (by 5 to 15 dBA) than those during the nighttime and early morning hours, and can be as low as 42 to 45 dBA at locations removed from the major roadways. The project area's residual background noise levels are approximately midway between those of low density residential areas and the Waikiki area.

The results of the traffic and background ambient noise measurements are summarized in Table 2, with measurement locations identified in Figure 1. The measurement sites were typically located at street level, except at Location I, which was elevated at the second level of the shopping center's parking structure. As shown in Table 2, correlation between measured and predicted traffic noise levels was good. The traffic noise model's "Pavement" propagation loss factor was used to obtain the good correlation. Table 4 presents the calculations of existing traffic noise levels during the AM or PM peak traffic hour (whichever was the highest) at 50, 75, and 100 feet setback distances from the roadways' centerlines. Estimated distances to the roadways' 65, 70, and 75 DNL contours are shown in Table 5 for unobstructed line of sight conditions.

Motor vehicle traffic is the dominant noise source in the project area, and its

TABLE 4

EXISTING (CY 2013) TRAFFIC VOLUMES AND NOISE LEVELS ALONG ROADWAYS IN PROJECT AREA (AM OR PM PEAK HOUR)

LOCATION	SPEED (MPH)	TOTAL VPH	****** VOLUMES (VPH) ******** AUTOS	M TRUCKS	H TRUCKS	50' Leq	75' Leq	100' Leq
King St. W. of South (PM)	40	1,682	1,606	20	56	70.3	68.0	66.7
King St. E. of South (PM)	40	2,274	2,172	27	75	71.6	69.3	68.0
King St. Between Ward & Pensacola (AM)	40	2,854	2,726	34	94	72.6	70.3	69.0
Kapiolani Blvd. W. of South (PM)	32	1,043	1,002	13	28	65.6	63.4	62.1
Kapiolani Blvd. Between South & Ward (PM)	32	2,054	1,974	25	55	68.6	66.4	65.1
Kapiolani Blvd. Between Ward & Kamakee (PM)	32	2,663	2,559	32	72	69.8	67.5	66.2
Kapiolani Blvd. Between Kamakee & Pensacola (PM)	32	2,709	2,603	33	73	69.8	67.6	66.3
Kapiolani Blvd. Between Pensacola & Piikoi (PM)	32	2,640	2,537	32	71	69.7	67.5	66.2
Queen St. W. of South (PM)	29	1,355	1,331	12	12	64.1	62.3	61.0
Queen St. Between South & Cooke (PM)	29	1,095	1,075	10	10	63.3	61.4	60.2
Queen St. Between Cooke & Ward (PM)	29	1,018	1,000	9	9	63.0	61.0	59.8
Queen St. Between Ward & Kamakee (PM)	29	890	874	8	8	62.3	60.5	59.2
Queen St. E. of Kamakee (PM)	29	1,062	1,042	10	10	63.2	61.3	60.1
Waimanu St. W. of Pensacola (PM)	29	1,196	1,174	11	11	63.7	61.8	60.5
Waimanu St. Between Pensacola & Piikoi (PM)	29	1,190	1,168	11	11	63.7	61.8	60.5
Halekauwila St. W. of South (PM)	36	656	646	9	1	62.8	61.1	59.9
Halekauwila St. Between South & Cooke (PM)	36	437	430	6	1	61.1	59.4	58.2
Halekauwila St. Between Cooke & Ward (PM)	36	453	446	6	1	61.2	59.5	58.3
Pohukaina St. W. of South (PM)	30	499	486	5	8	60.4	58.7	57.5
Pohukaina St. Between South & Cooke (PM)	30	428	416	5	7	59.8	58.1	56.9
Pohukaina St. E. of Cooke (PM)	30	475	462	5	8	60.3	58.6	57.4
Auahi St. W. of Ward (AM)	30	290	282	3	5	58.6	56.6	55.4
Auahi St. Between Ward & Kamakee (PM)	30	729	709	8	12	62.4	60.5	59.3
Auahi St. E. of Kamakee (PM)	30	522	507	6	9	61.1	59.2	57.9
Nimitz Hwy. Between Fort & Bishop (AM)	36	3,865	3,641	104	120	73.7	71.0	69.5
Ala Moana Blvd. W. of South (PM)	30	4,697	4,546	52	99	72.0	69.3	67.9
Ala Moana Blvd. Between South & Cooke (PM)	30	4,184	4,050	46	88	71.5	68.8	67.4
Ala Moana Blvd. Between Cooke & Ward (PM)	30	3,838	3,715	42	81	71.1	68.5	67.0
Ala Moana Blvd. Between Ward & Kamakee (PM)	30	3,834	3,711	42	81	71.1	68.5	67.0
Ala Moana Blvd. Between Kamakee & Queen (PM)	30	3,579	3,465	39	75	70.8	68.1	66.7
Ala Moana Blvd. Between Queen & Piikoi (PM)	30	3,945	3,819	43	83	71.2	68.6	67.1
Ala Moana Blvd. E. of Piikoi (PM)	30	3,714	3,595	41	78	71.0	68.3	66.9
Ilalo St. W. of Keawe (PM)	35	261	258	0	3	59.4	57.2	55.9
Ilalo St. Between Keawe & Cooke (PM)	35	297	294	0	3	59.9	57.7	56.4
Ilalo St. Between Cooke & Ahui (PM)	35	310	307	0	3	60.1	57.9	56.5
Ilalo St. Between Ahui & Ala Moana (PM)	35	315	312	0	3	60.2	57.9	56.6
Punchbowl St. Between King & Queen (AM)	37	627	599	5	23	64.8	62.8	61.6
Punchbowl St. Between Queen & Halekauwila (AM)	37	749	715	6	28	65.6	63.6	62.4
Forrest Ave. S. of Ala Moana (AM)	31	265	261	4	0	57.2	55.4	54.2
South St. Between Ala Moana & Pohukaina (PM)	31	495	473	8	14	61.8	59.9	58.7
South St. Between Pohukaina & Halekauwila (PM)	31	655	627	10	18	62.9	61.1	59.8
South St. Between Halekauwila & Queen (PM)	31	1,142	1,092	18	32	65.4	63.5	62.3
South St. Between Queen & Kapiolani (PM)	31	1,383	1,322	22	39	66.5	64.5	63.2
South St. Between Kapiolani & King (PM)	31	2,028	1,939	32	57	68.1	66.1	64.8
Cooke St. S. of Ilalo (PM)	36	127	119	6	2	57.6	55.6	54.4
Cooke St. Between Ilalo & Ala Moana (PM)	36	163	154	7	2	58.4	56.4	55.2
Cooke St. Between Ala Moana & Pohukaina (PM)	36	445	420	20	5	62.6	60.7	59.5
Cooke St. Between Pohukaina & Halekauwila (PM)	36	702	663	31	8	64.5	62.7	61.4
Cooke St. Between Halekauwila & Queen (PM)	36	821	775	36	10	65.3	63.4	62.2
Cooke St. N. of Queen (PM)	36	875	825	39	11	65.6	63.7	62.5

TABLE 4 (CONTINUED)

EXISTING (CY 2013) TRAFFIC VOLUMES AND NOISE LEVELS ALONG ROADWAYS IN PROJECT AREA (AM OR PM PEAK HOUR)

LOCATION	SPEED (MPH)	TOTAL VPH	****** VOLUMES (VPH) ******** AUTOS	M TRUCKS	H TRUCKS	50' Leq	75' Leq	100' Leq
Ward Ave. Between Ala Moana & Auahi (PM)	39	1,051	1,026	17	8	66.8	64.7	63.4
Ward Ave. Between Auahi & Halekauwila (PM)	39	1,290	1,259	21	10	67.7	65.6	64.3
Ward Ave. Between Halekauwila & Queen (PM)	39	1,618	1,579	26	13	68.7	66.6	65.3
Ward Ave. Between Queen & Kapiolani (PM)	39	1,708	1,667	27	14	68.9	66.8	65.5
Ward Ave. N. of Kapiolani (PM)	39	1,701	1,660	27	14	68.9	66.8	65.5
Kamakee St. Between Ala Moana & Auahi (PM)	29	461	453	4	4	59.4	57.6	56.3
Kamakee St. Between Auahi & Queen (PM)	29	693	681	6	6	61.1	59.3	58.1
Kamakee St. Between Queen & Kapiolani (PM)	29	625	613	6	6	60.8	58.9	57.7
Queen St. N. of Ala Moana (PM)	29	402	394	4	4	59.0	57.1	55.9
Pensacola St. N. of Waimanu (PM)	30	1,022	1,006	7	9	63.0	61.3	60.1
Pensacola St. Between Waimanu & Kapiolani (PM)	30	982	966	7	9	62.9	61.1	59.9
Pensacola St. N. of Kapiolani (PM)	30	1,119	1,101	8	10	63.6	61.7	60.5
Piikoi St. N. of Ala Moana (PM)	30	1,352	1,248	24	80	68.9	66.1	64.5
Piikoi St. Between Ala Moana & Waimanu (PM)	30	1,410	1,302	25	83	68.7	66.2	64.7
Piikoi St. Between Waimanu & Kapiolani (PM)	30	1,662	1,534	30	98	69.8	66.9	65.4
Piikoi St. N. of Kapiolani (PM)	30	1,463	1,351	26	86	68.3	66.0	64.7

TABLE 5

EXISTING AND CY 2035 DISTANCES TO 65, 70, AND 75 DNL CONTOURS

STREET SECTION	65 DNL SETBACK (FT)		70 DNL SETBACK (FT)		75 DNL SETBACK (FT)	
	EXISTING	CY 2035	EXISTING	CY 2035	EXISTING	CY 2035
King St. W. of South	136	152	50	55	21	23
King St. E. of South	182	189	63	68	26	27
King St. Between Ward & Pensacola	227	227	75	81	31	32
Kapiolani Blvd. W. of South	57	58	23	23	< 12	< 12
Kapiolani Blvd. Between South & Ward	105	128	39	48	16	19
Kapiolani Blvd. Between Ward & Kamakee	133	136	49	49	20	20
Kapiolani Blvd. Between Kamakee & Pensacola	136	146	49	52	20	21
Kapiolani Blvd. Between Pensacola & Piikoi	133	125	48	47	19	19
Queen St. W. of South	41	51	13	18	< 12	< 12
Queen St. Between South & Cooke	35	49	12	17	< 12	< 12
Queen St. Between Cooke & Ward	33	32	12	< 12	< 12	< 12
Queen St. Between Ward & Kamakee	27	35	< 12	12	< 12	< 12
Queen St. E. of Kamakee	34	34	12	12	< 12	< 12
Waimanu St. W. of Pensacola	38	49	13	17	< 12	< 12
Waimanu St. Between Pensacola & Piikoi	38	35	13	12	< 12	< 12
Halekauwila St. W. of South	30	26	< 12	< 12	< 12	< 12
Halekauwila St. Between South & Cooke	20	21	< 12	< 12	< 12	< 12
Halekauwila St. Between Cooke & Ward	20	21	< 12	< 12	< 12	< 12
Pohukaina St. W. of South	17	21	< 12	< 12	< 12	< 12
Pohukaina St. Between South & Cooke	14	20	< 12	< 12	< 12	< 12
Pohukaina St. E. of Cooke	16	27	< 12	< 12	< 12	< 12
Auahi St. W. of Ward	14	31	< 12	< 12	< 12	< 12
Auahi St. Between Ward & Kamakee	29	47	< 12	16	< 12	< 12
Auahi St. E. of Kamakee	22	31	< 12	< 12	< 12	< 12
Nimitz Hwy. Between Fort & Bishop	271	271	104	104	46	45
Ala Moana Blvd. W. of South	193	215	71	83	33	37
Ala Moana Blvd. Between South & Cooke	174	197	66	71	31	34
Ala Moana Blvd. Between Cooke & Ward	155	178	62	69	29	32
Ala Moana Blvd. Between Ward & Kamakee	155	192	62	74	29	34
Ala Moana Blvd. Between Kamakee & Queen	151	185	59	69	28	32
Ala Moana Blvd. Between Queen & Piikoi	158	171	63	67	29	31
Ala Moana Blvd. E. of Piikoi	157	174	61	66	29	31
Ilalo St. W. of Keawe	18	25	< 12	< 12	< 12	< 12
Ilalo St. Between Keawe & Cooke	20	32	< 12	13	< 12	< 12
Ilalo St. Between Cooke & Ahui	20	40	< 12	16	< 12	< 12
Ilalo St. Between Ahui & Ala Moana	21	32	< 12	13	< 12	< 12
Punchbowl St. Between King & Queen	44	61	16	21	< 12	< 12
Punchbowl St. Between Queen & Halekauwila	52	47	19	17	< 12	< 12
Forrest Ave. S. of Ala Moana	< 12	17	< 12	< 12	< 12	< 12
South St. Between Ala Moana & Pohukaina	25	37	< 12	13	< 12	< 12
South St. Between Pohukaina & Halekauwila	31	42	< 12	15	< 12	< 12
South St. Between Halekauwila & Queen	54	63	19	22	< 12	< 12
South St. Between Queen & Kapiolani	68	66	25	24	< 12	< 12
South St. Between Kapiolani & King	96	139	34	48	12	17
Cooke St. S. of Ilalo	< 12	< 12	< 12	< 12	< 12	< 12
Cooke St. Between Ilalo & Ala Moana	13	32	< 12	< 12	< 12	< 12
Cooke St. Between Ala Moana & Pohukaina	30	34	< 12	12	< 12	< 12

TABLE 5 (CONTINUED)

EXISTING AND CY 2035 DISTANCES TO 65, 70, AND 75 DNL CONTOURS

STREET SECTION	65 DNL SETBACK (FT)		70 DNL SETBACK (FT)		75 DNL SETBACK (FT)	
	EXISTING	CY 2035	EXISTING	CY 2035	EXISTING	CY 2035
Cooke St. Between Pohukaina & Halekauwila	45	84	14	27	< 12	< 12
Cooke St. Between Halekauwila & Queen	53	102	18	34	< 12	12
Cooke St. N. of Queen	57	102	20	33	< 12	< 12
Ward Ave. Between Ala Moana & Auahi	94	174	35	59	13	23
Ward Ave. Between Auahi & Halekauwila	114	139	41	49	16	19
Ward Ave. Between Halekauwila & Queen	142	146	50	51	19	19
Ward Ave. Between Queen & Kapiolani	149	253	52	84	20	31
Ward Ave. N. of Kapiolani	149	222	52	74	20	28
Kamakee St. Between Ala Moana & Auahi	14	45	< 12	15	< 12	< 12
Kamakee St. Between Auahi & Queen	21	29	< 12	< 12	< 12	< 12
Kamakee St. Between Queen & Kapiolani	20	24	< 12	< 12	< 12	< 12
Queen St. N. of Ala Moana	14	18	< 12	< 12	< 12	< 12
Pensacola St. N. of Waimanu	31	31	< 12	< 12	< 12	< 12
Pensacola St. Between Waimanu & Kapiolani	31	39	< 12	13	< 12	< 12
Pensacola St. N. of Kapiolani	37	63	13	20	< 12	< 12
Piikoi St. N. of Ala Moana	120	149	53	62	26	27
Piikoi St. Between Ala Moana & Waimanu	126	151	52	64	23	30
Piikoi St. Between Waimanu & Kapiolani	144	181	60	70	30	31
Piikoi St. N. of Kapiolani	130	152	48	55	20	23

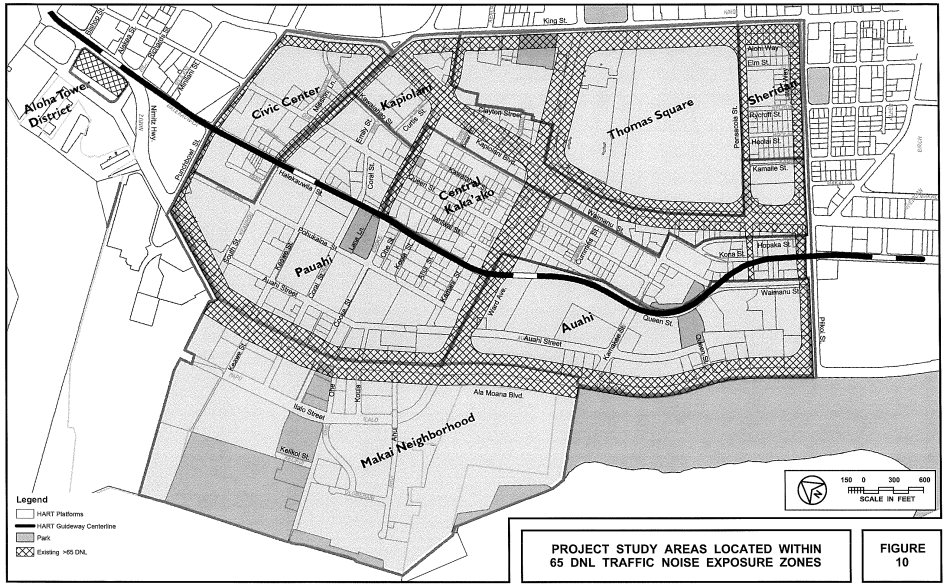
Notes:

(1) All setback distances are from the roadways' centerlines.
(2) See Tables 4 and 6 for traffic volume, speed, and mix assumptions.
(3) Setback distances are for ground level receptors.
(4) "Pavement" conditions assumed along all roadways.

volume, average speed, and vehicle mix determine which traffic corridors are in the "Significant Exposure, Normally Unacceptable" noise exposure category or greater than 65 DNL. Using the results shown in Table 5, the estimated locations of the existing 65 DNL contours are shown graphically in Figure 10, with the crosshatched areas representing potential traffic noise levels within the "Significant Exposure, Normally Unacceptable" noise exposure zone or greater than 65 DNL (see Table 1). Actual traffic noise levels within the crosshatched regions of Figure 10 could be less than 65 DNL if the receptor is shielded from the traffic lanes by intervening buildings or walls. They could also be higher than those shown in Figure 10 at receptor locations which receive traffic noise contributions from more than one roadway.

Using the results shown in Table 5 and Figure 10, the following conclusions were possible regarding existing traffic noise levels in the project area:

- The Aloha Tower District is essentially all within the "Significant Exposure, Normally Unacceptable" noise exposure zone due to traffic noise from Nimitz Highway.
- The Makai Neighborhood's "Significant Exposure, Normally Unacceptable" noise exposure zone is located along its mauka boundary, and controlled by traffic on Ala Moana Boulevard.
- The Civic Center Neighborhood's "Significant Exposure, Normally Unacceptable" noise exposure zones are located along its district boundaries at King, South, and Punchbowl Streets.
- The Pauahi Neighborhood's "Significant Exposure, Normally Unacceptable" noise exposure zones are located along its district boundaries at Ala Moana Boulevard and Ward Avenue, and to a lesser extent at Punchbowl, Cooke, and Coral Streets. A relatively large portion of the district is not within the 65 DNL noise exposure zone.
- The Kapiolani Neighborhood's "Significant Exposure, Normally Unacceptable" noise exposure zones represent 50.3 percent of the total land area within its district boundaries because of its orientation alongside Kapiolani Boulevard, King Street, Ward Avenue, Pensacola Street, and Piikoi Street.
- The Thomas Square Neighborhood's "Significant Exposure, Normally Unacceptable" noise exposure zones are located along King, Pensacola, and Cooke Streets and along Ward Avenue and Kapiolani Boulevard.
- The Central Kaka`ako Neighborhood's "Significant Exposure, Normally Unacceptable" noise exposure zones are located along Ward Avenue and Cooke, Pensacola, and Piikoi Streets.



PROJECT STUDY AREAS LOCATED WITHIN 65 DNL TRAFFIC NOISE EXPOSURE ZONES

FIGURE 10

- The Sheridan Neighborhood's "Significant Exposure, Normally Unacceptable" noise exposure zones are located along King, Pensacola, and Piikoi Streets.

- The Auahi Neighborhood's "Significant Exposure, Normally Unacceptable" noise exposure zones are located along Ala Moana Boulevard, Ward Avenue, and Piikoi Street.

CHAPTER VI. FUTURE NOISE ENVIRONMENT

Motor Vehicle Traffic Noise. Predictions of future traffic noise levels with and without the TOD Plan were made using the traffic volume assignments of Reference 6 for CY 2035. The future projections of project plus non-project traffic noise levels along the roadways which service the project area are shown in Table 6 for the AM or PM peak hour of traffic, under Alternative A. Table 7 presents the calculations of future traffic noise level changes along each roadway from 2013 to 2035 from non-project and project traffic. Table 5 presents the future setback distances to the 65, 70, and 75 DNL traffic noise contours under Alternative A for unobstructed line-of-site conditions.

Except for the section of Kamakee Street between Ala Moana Boulevard and Auahi Street, essentially no significant increases in traffic noise levels are expected in the project environs between CY 2011 and 2035 as a result of the project (see Table 7). Traffic noise level increases associated with the TOD Plan are predicted to be 1.3 DNL or less along all of the other street sections evaluated. Baseline traffic noise level increases from 2013 to 2035 not attributable to the TOD Plan are typically higher than those attributable to the TOD Plan (see Table 7). Figure 11 depicts the estimated locations of the 2035 traffic noise contours within the various neighborhoods of the KCDD. The anticipated increases in the "Significant Exposure, Normally Unacceptable" noise exposure zones are shown in Table 5 and can be seen visually by comparing Figures 10 and 11. It should be noted that the primary cause of the relatively large increases in the sizes of the "Significant Exposure, Normally Unacceptable" noise exposure zones from 2013 to 2035 is the projected increases in Baseline traffic volumes (except along Kamakee Street between Ala Moana Boulevard to Auahi Street). Also shown in Figure 11 are the locations of noise sensitive residential developments which are under construction or in the planning phases (Star-Advertiser, June 3, 2013).

The dominant traffic noise sources in the project area will continue to be traffic noise from Nimitz Highway, Ala Moana Boulevard, Kapiolani Boulevard, King Street, and Ward Avenue. Some sections of Piikoi, South, and Cooke Streets will also have future 65 DNL contour zones similar to the existing 65 DNL contour zones along Kapiolani Boulevard. As is the situation with existing receptors in Kaka`ako, the beneficial effects of shielding from existing or future buildings and walls will lower the predicted traffic noise levels and setback distances shown in Table 5, Table 6, and Figure 11 for future receptors.

Figure 11 also includes the locations of ground and high-rise receptors where existing and future traffic noise levels were calculated. At each labeled receptor, multiple receptor locations (indicated by three solid circles) at 50, 100, and 200 feet setback distance from the roadway centerline and at ground level, 50, 100, 150, 200, and 300 feet elevations were used to calculate existing, Future Baseline, and Future Alternative A traffic noise levels. At these receptor locations, the effects resulting from increased receptor setbacks and elevations, and from combining traffic noise

TABLE 6

FUTURE (CY 2035) TRAFFIC VOLUMES AND NOISE LEVELS
ALONG ROADWAYS IN PROJECT AREA
(AM OR PM PEAK HOUR, TOD ALTERNATIVE A)

LOCATION	SPEED (MPH)	TOTAL VPH	****** VOLUMES (VPH) ******** AUTOS	M TRUCKS	H TRUCKS	50' Leq	75' Leq	100' Leq
King St. W. of South (PM)	40	1,894	1,808	23	63	70.8	68.5	67.2
King St. E. of South (PM)	40	2,526	2,413	30	83	72.0	69.8	68.4
King St. Between Ward & Pensacola (PM)	40	3,079	2,940	37	102	72.9	70.7	69.3
Kapiolani Blvd. W. of South (PM)	32	1,056	1,014	13	29	65.7	63.5	62.2
Kapiolani Blvd. Between South & Ward (AM)	32	2,627	2,524	32	71	69.7	67.5	66.1
Kapiolani Blvd. Between Ward & Kamakee (AM)	32	2,712	2,606	33	73	69.8	67.6	66.3
Kapiolani Blvd. Between Kamakee & Pensacola (PM)	32	2,882	2,769	35	78	70.1	67.9	66.6
Kapiolani Blvd. Between Pensacola & Piikoi (AM)	32	2,567	2,467	31	69	69.6	67.4	66.0
Queen St. W. of South (PM)	29	1,689	1,659	15	15	65.1	63.2	62.0
Queen St. Between South & Cooke (PM)	29	1,597	1,569	14	14	64.9	63.0	61.8
Queen St. Between Cooke & Ward (PM)	29	1,011	993	9	9	62.9	61.0	59.8
Queen St. Between Ward & Kamakee (PM)	29	1,094	1,074	10	10	63.3	61.4	60.2
Queen St. E. of Kamakee (PM)	29	1,065	1,045	10	10	63.2	61.3	60.1
Waimanu St. W. of Pensacola (PM)	29	1,582	1,554	14	14	64.9	63.0	61.7
Waimanu St. Between Pensacola & Piikoi (AM)	29	1,107	1,087	10	10	63.3	61.4	60.2
Halekauwila St. W. of South (PM)	36	574	566	7	1	62.2	60.5	59.3
Halekauwila St. Between South & Cooke (PM)	36	462	455	6	1	61.3	59.6	58.4
Halekauwila St. Between Cooke & Ward (PM)	36	461	454	6	1	61.3	59.6	58.4
Pohukaina St. W. of South (PM)	30	609	592	7	10	61.4	59.7	58.5
Pohukaina St. Between South & Cooke (AM)	30	560	544	6	10	61.1	59.4	58.2
Pohukaina St. E. of Cooke (PM)	30	777	755	9	13	62.4	60.7	59.5
Auahi St. W. of Ward (PM)	30	771	750	8	13	62.7	60.8	59.6
Auahi St. Between Ward & Kamakee (PM)	30	1,226	1,192	13	21	64.7	62.8	61.6
Auahi St. E. of Kamakee (PM)	30	778	756	9	13	62.8	60.9	59.6
Nimitz Hwy. Between Fort & Bishop (PM)	36	3,837	3,614	104	119	73.6	71.0	69.5
Ala Moana Blvd. W. of South (PM)	30	5,663	5,482	62	119	72.8	70.2	68.7
Ala Moana Blvd. Between South & Cooke (PM)	30	4,788	4,634	53	101	72.1	69.4	68.0
Ala Moana Blvd. Between Cooke & Ward (PM)	30	4,531	4,386	50	95	71.8	69.2	67.7
Ala Moana Blvd. Between Ward & Kamakee (PM)	30	4,938	4,780	54	104	72.2	69.6	68.1
Ala Moana Blvd. Between Kamakee & Queen (PM)	30	4,479	4,336	49	94	71.8	69.1	67.7
Ala Moana Blvd. Between Queen & Piikoi (PM)	30	4,321	4,182	48	91	71.6	69.0	67.5
Ala Moana Blvd. E. of Piikoi (PM)	30	4,187	4,053	46	88	71.5	68.8	67.4
Ilalo St. W. of Keawe (PM)	35	399	395	0	4	61.3	59.1	57.7
Ilalo St. Between Keawe & Cooke (PM)	35	515	510	0	5	62.4	60.1	58.8
Ilalo St. Between Cooke & Ahui (PM)	35	688	681	0	7	63.7	61.4	60.0
Ilalo St. Between Ahui & Ala Moana (PM)	35	529	524	0	5	62.5	60.2	58.9
Punchbowl St. Between King & Queen (AM)	37	888	848	7	33	66.3	64.4	63.1
Punchbowl St. Between Queen & Halekauwila (AM)	37	664	634	5	25	65.1	63.1	61.9
Forrest Ave. S. of Ala Moana (PM)	31	527	519	8	0	60.2	58.4	57.1
South St. Between Ala Moana & Pohukaina (PM)	31	754	721	12	21	63.6	61.7	60.5
South St. Between Pohukaina & Halekauwila (PM)	31	856	818	14	24	64.2	62.3	61.1
South St. Between Halekauwila & Queen (PM)	31	1,313	1,255	21	37	66.1	64.2	62.9
South St. Between Queen & Kapiolani (PM)	31	1,370	1,310	22	38	66.4	64.4	63.1
South St. Between Kapiolani & King (AM)	31	2,989	2,857	48	84	69.8	67.8	66.5
Cooke St. S. of Ilalo (PM)	36	127	119	6	2	57.6	55.6	54.4
Cooke St. Between Ilalo & Ala Moana (AM)	36	468	441	21	6	62.9	61.0	59.8
Cooke St. Between Ala Moana & Pohukaina (PM)	36	507	479	22	6	63.2	61.3	60.1
Cooke St. Between Pohukaina & Halekauwila (PM)	36	1,329	1,255	58	16	67.3	65.5	64.2
Cooke St. Between Halekauwila & Queen (PM)	36	1,612	1,522	71	19	68.2	66.3	65.1
Cooke St. N. of Queen (PM)	36	1,629	1,537	72	20	68.2	66.4	65.1

TABLE 6 (CONTINUED)

FUTURE (CY 2035) TRAFFIC VOLUMES AND NOISE LEVELS
ALONG ROADWAYS IN PROJECT AREA
(AM OR PM PEAK HOUR, TOD ALTERNATIVE A)

LOCATION	SPEED (MPH)	TOTAL VPH	****** VOLUMES (VPH) ******** AUTOS	M TRUCKS	H TRUCKS	50' Leq	75' Leq	100' Leq
Ward Ave. Between Ala Moana & Auahi (PM)	39	2,010	1,962	32	16	69.6	67.5	66.2
Ward Ave. Between Auahi & Halekauwila (PM)	39	1,571	1,533	25	13	68.6	66.5	65.2
Ward Ave. Between Halekauwila & Queen (AM)	39	1,674	1,634	27	13	68.8	66.7	65.4
Ward Ave. Between Queen & Kapiolani (AM)	39	2,976	2,904	48	24	71.3	69.2	67.9
Ward Ave. N. of Kapiolani (PM)	39	2,590	2,528	41	21	70.7	68.6	67.3
Kamakee St. Between Ala Moana & Auahi (PM)	29	1,477	1,451	13	13	64.5	62.6	61.4
Kamakee St. Between Auahi & Queen (PM)	29	907	891	8	8	62.4	60.5	59.3
Kamakee St. Between Queen & Kapiolani (AM)	29	809	795	7	7	61.8	60.0	58.7
Queen St. N. of Ala Moana (PM)	29	531	521	5	5	60.1	58.2	57.0
Pensacola St. N. of Waimanu (PM)	30	967	951	7	9	62.9	61.1	59.9
Pensacola St. Between Waimanu & Kapiolani (PM)	30	1,248	1,228	9	11	63.9	62.1	60.9
Pensacola St. N. of Kapiolani (PM)	30	1,960	1,928	14	18	66.0	64.2	62.9
Piikoi St. N. of Ala Moana (PM)	30	1,787	1,650	32	105	69.8	67.3	65.7
Piikoi St. Between Ala Moana & Waimanu (PM)	30	1,834	1,693	33	108	70.1	67.4	65.8
Piikoi St. Between Waimanu & Kapiolani (AM)	30	2,181	2,013	39	129	70.6	68.1	66.6
Piikoi St. N. of Kapiolani (PM)	30	1,729	1,596	31	102	69.0	66.7	65.4

TABLE 7

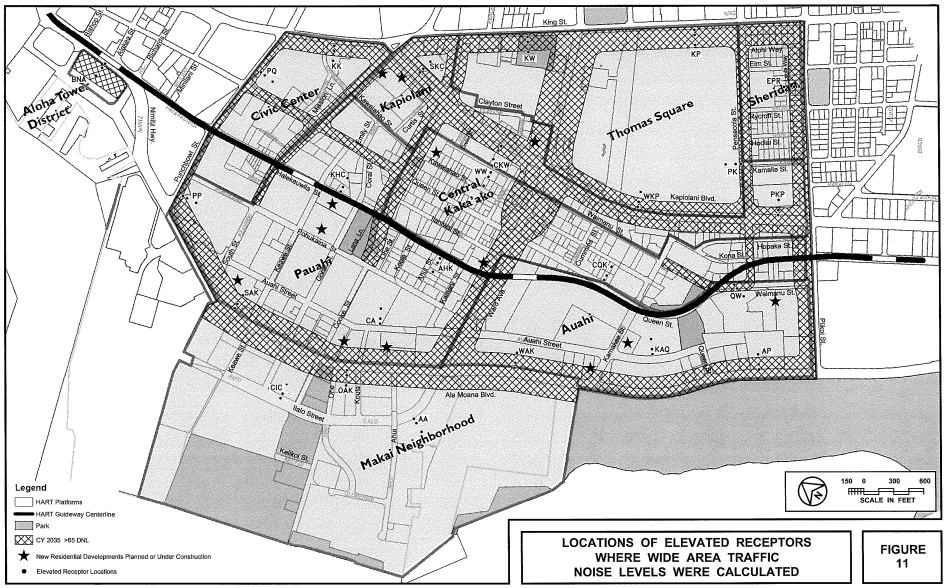
CALCULATIONS OF PROJECT AND NON-PROJECT TRAFFIC NOISE CONTRIBUTIONS (CY 2035) (PEAK HOUR LEQ OR DNL)

STREET SECTION	NOISE LEVEL INCREASE DUE TO: NON-PROJECT TRAFFIC	PROJECT TRAFFIC
King St. W. of South	0.4	0.1
King St. E. of South	0.6	-0.1
King St. Between Ward & Pensacola	0.3	0.1
Kapiolani Blvd. W. of South	0.0	0.1
Kapiolani Blvd. Between South & Ward	0.9	0.2
Kapiolani Blvd. Between Ward & Kamakee	0.0	0.1
Kapiolani Blvd. Between Kamakee & Pensacola	0.9	-0.6
Kapiolani Blvd. Between Pensacola & Piikoi	0.5	-0.6
Queen St. W. of South	1.0	-0.1
Queen St. Between South & Cooke	1.4	0.2
Queen St. Between Cooke & Ward	0.0	0.0
Queen St. Between Ward & Kamakee	0.7	0.2
Queen St. E. of Kamakee	0.0	0.0
Waimanu St. W. of Pensacola	1.5	-0.3
Waimanu St. Between Pensacola & Piikoi	-0.4	0.0
Halekauwila St. W. of South	-0.6	0.0
Halekauwila St. Between South & Cooke	0.0	0.2
Halekauwila St. Between Cooke & Ward	0.2	-0.1
Pohukaina St. W. of South	1.0	0.0
Pohukaina St. Between South & Cooke	2.0	-0.7
Pohukaina St. E. of Cooke	2.4	-0.3
Auahi St. W. of Ward	4.5	-0.3
Auahi St. Between Ward & Kamakee	2.1	0.2
Auahi St. E. of Kamakee	1.5	0.2
Nimitz Hwy. Between Fort & Bishop	-0.1	0.1
Ala Moana Blvd. W. of South	0.5	0.4
Ala Moana Blvd. Between South & Cooke	0.2	0.4
Ala Moana Blvd. Between Cooke & Ward	0.1	0.6
Ala Moana Blvd. Between Ward & Kamakee	0.0	1.1
Ala Moana Blvd. Between Kamakee & Queen	0.1	0.9
Ala Moana Blvd. Between Queen & Piikoi	0.3	0.1
Ala Moana Blvd. E. of Piikoi	0.2	0.3
Ilalo St. W. of Keawe	1.1	0.8
Ilalo St. Between Keawe & Cooke	2.0	0.4
Ilalo St. Between Cooke & Ahui	3.4	0.1
Ilalo St. Between Ahui & Ala Moana	2.2	0.1
Punchbowl St. Between King & Queen	1.7	-0.1
Punchbowl St. Between Queen & Halekauwila	-0.1	-0.4

TABLE 7 (CONTINUED)

CALCULATIONS OF PROJECT AND NON-PROJECT TRAFFIC NOISE CONTRIBUTIONS (CY 2035) (PEAK HOUR LEQ OR DNL)

STREET SECTION	NOISE LEVEL INCREASE DUE TO: NON-PROJECT TRAFFIC	PROJECT TRAFFIC
Forrest Ave. S. of Ala Moana	2.6	0.4
South St. Between Ala Moana & Pohukaina	1.8	0.0
South St. Between Pohukaina & Halekauwila	1.5	-0.3
South St. Between Halekauwila & Queen	1.0	-0.3
South St. Between Queen & Kapiolani	0.2	-0.3
South St. Between Kapiolani & King	0.8	0.9
Cooke St. S. of Ilalo	0.0	0.0
Cooke St. Between Ilalo & Ala Moana	4.4	0.2
Cooke St. Between Ala Moana & Pohukaina	0.7	-0.1
Cooke St. Between Pohukaina & Halekauwila	1.5	1.3
Cooke St. Between Halekauwila & Queen	2.3	0.6
Cooke St. N. of Queen	2.8	-0.1
Ward Ave. Between Ala Moana & Auahi	2.1	0.7
Ward Ave. Between Auahi & Halekauwila	0.9	0.0
Ward Ave. Between Halekauwila & Queen	1.0	-0.9
Ward Ave. Between Queen & Kapiolani	2.4	0.0
Ward Ave. N. of Kapiolani	2.3	-0.5
Kamakee St. Between Ala Moana & Auahi	1.6	3.4
Kamakee St. Between Auahi & Queen	0.1	1.1
Kamakee St. Between Queen & Kapiolani	0.2	0.9
Queen St. N. of Ala Moana	1.3	-0.2
Pensacola St. N. of Waimanu	0.0	-0.2
Pensacola St. Between Waimanu & Kapiolani	2.5	-1.5
Pensacola St. N. of Kapiolani	3.0	-0.5
Piikoi St. N. of Ala Moana	0.0	1.2
Piikoi St. Between Ala Moana & Waimanu	0.1	1.1
Piikoi St. Between Waimanu & Kapiolani	0.7	0.5
Piikoi St. N. of Kapiolani	0.8	-0.1



LOCATIONS OF ELEVATED RECEPTORS WHERE WIDE AREA TRAFFIC NOISE LEVELS WERE CALCULATED

FIGURE 11

contributions from multiple roadway sections were included in the calculations. Table 8 presents the results of these calculations of worst case traffic noise DNL values, which do not include the noise shielding effects from buildings or walls. In general, the DNL values shown in Table 8 may be higher than those shown in Tables 4 through 6 because of the additive contributions from multiple roadway segments at each receptor location. The values shown in Table 8 may also be higher than actual values because of the traffic noise reduction effects of shielding from buildings and walls. Along the high volume streets, however, the values shown in Table 8 should be consistent with the values shown in Tables 4 through 6. The results shown in Table 8 indicate very small changes in 2035 traffic noise levels associated with the TOD plan.

Elevated Fixed Guideway (Rail) Transit System Noise. The Honolulu Fixed Guideway Transit System is expected to cross through the Mauka Neighborhood Zone of the KCDD where shown in Figure 1 and subsequent report figures. The elevated guideway is expected to range from approximately 29 to 42 feet above ground level, be of concrete construction, have 3 feet high sidewalls for mitigation of transit system noise impacts at low and mid-rise receptors, and include wheel skirts for transit vehicles to increase the noise attenuation for elevated receptors. Information used to describe the future noise levels from transit vehicles within or slightly beyond the KCCD planning boundaries were obtained from References 33 and 34. The following summarizes the predicted transit system noise levels for 2030 using the information contained in Appendix A of Reference 34:

- At 700 Richards Street, rail noise levels were predicted to range from 67 DNL to 62 DNL or less without soundwalls or wheel skirts. With "current design", predicted rail noise levels ranged from 65 DNL to 62 DNL or less. The use of 3 feet high sidewalls did not seem to be included in the "current design".

- At 610 Cooke Street, rail noise levels were predicted to range from 71 DNL to 72 DNL without soundwalls or wheel skirts. With "current design", predicted rail noise levels ranged from 56 DNL to 62 DNL. The use of 3 feet high sidewalls seemed to be included in the "current design".

- At Mother Waldron Park, rail noise level was predicted to be 62 DNL without soundwalls or wheel skirts. With "current design", predicted rail noise level was 47 DNL. The use of 3 feet high sidewalls seemed to be included in the "current design". The location within the park was not indicated, but was estimated to be approximately 200 feet from the vertical plane through the rail centerline.

- At 860 Halekauwila Street, rail noise levels were predicted to range from 72 DNL to 62 DNL or less without soundwalls or wheel skirts. With "current design", predicted rail noise levels ranged from 57 DNL to 61 DNL or less. The use of 3 feet high sidewalls seemed to be included in the "current design".

TABLE 8
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
AA	50	0	62.9	64.2	64.5
AA	50	50	62.3	63.6	63.9
AA	50	100	62.5	63.8	64.1
AA	50	150	62.4	63.7	64.0
AA	50	200	62.3	63.6	63.9
AA	50	300	62.0	63.3	63.6
AA	100	0	61.7	62.7	63.1
AA	100	50	60.9	62.0	62.4
AA	100	100	61.0	62.1	62.4
AA	100	150	61.0	62.1	62.4
AA	100	200	61.0	62.0	62.4
AA	100	300	60.8	61.8	62.2
AA	200	0	60.4	61.3	61.7
AA	200	50	59.7	60.6	61.0
AA	200	100	59.8	60.6	61.0
AA	200	150	59.8	60.6	61.0
AA	200	200	59.7	60.6	61.0
AA	200	300	59.6	60.5	60.9
AHK	50	0	64.4	65.1	65.1
AHK	50	50	63.7	64.4	64.4
AHK	50	100	63.8	64.6	64.6
AHK	50	150	63.9	64.7	64.7
AHK	50	200	63.8	64.6	64.6
AHK	50	300	63.5	64.3	64.3
AHK	100	0	63.3	64.2	64.2
AHK	100	50	62.6	63.5	63.5
AHK	100	100	62.7	63.6	63.6
AHK	100	150	62.7	63.6	63.7
AHK	100	200	62.6	63.6	63.6
AHK	100	300	62.5	63.4	63.4
AHK	200	0	62.6	63.7	63.8
AHK	200	50	61.9	63.0	63.0
AHK	200	100	62.0	63.1	63.2
AHK	200	150	62.1	63.2	63.3
AHK	200	200	62.1	63.1	63.2
AHK	200	300	61.9	63.0	63.1

TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
AP	50	0	70.7	71.1	71.2
AP	50	50	70.5	70.8	70.9
AP	50	100	70.2	70.5	70.6
AP	50	150	70.1	70.4	70.6
AP	50	200	70.2	70.5	70.6
AP	50	300	69.8	70.1	70.3
AP	100	0	67.6	67.9	68.1
AP	100	50	67.1	67.4	67.6
AP	100	100	66.9	67.2	67.4
AP	100	150	66.9	67.2	67.4
AP	100	200	66.7	67.0	67.2
AP	100	300	66.5	66.9	67.0
AP	200	0	64.9	65.3	65.5
AP	200	50	64.4	64.8	65.0
AP	200	100	64.1	64.5	64.7
AP	200	150	64.0	64.4	64.6
AP	200	200	63.9	64.3	64.5
AP	200	300	63.7	64.1	64.3
BNA	50	0	72.1	72.5	72.9
BNA	50	50	71.9	72.4	72.8
BNA	50	100	71.7	72.1	72.5
BNA	50	150	71.7	72.0	72.4
BNA	50	200	71.5	72.0	72.3
BNA	50	300	71.3	71.7	72.0
BNA	100	0	68.9	69.3	69.7
BNA	100	50	68.5	68.9	69.3
BNA	100	100	68.2	68.6	68.9
BNA	100	150	68.1	68.5	68.9
BNA	100	200	68.0	68.4	68.8
BNA	100	300	67.8	68.2	68.5
BNA	200	0	65.9	66.3	66.6
BNA	200	50	65.5	65.8	66.1
BNA	200	100	65.1	65.5	65.8
BNA	200	150	65.0	65.3	65.6
BNA	200	200	64.8	65.2	65.5
BNA	200	300	64.6	64.9	65.2

TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
CA	50	0	64.0	66.1	66.2
CA	50	50	63.2	65.5	65.5
CA	50	100	63.5	65.8	65.8
CA	50	150	63.4	65.6	65.7
CA	50	200	63.2	65.4	65.4
CA	50	300	63.0	65.2	65.2
CA	100	0	63.1	64.7	64.8
CA	100	50	62.1	63.9	64.0
CA	100	100	62.4	64.0	64.1
CA	100	150	62.4	63.9	64.1
CA	100	200	62.3	63.9	64.0
CA	100	300	62.1	63.7	63.8
CA	200	0	62.5	63.8	64.0
CA	200	50	61.5	63.0	63.1
CA	200	100	61.8	63.2	63.3
CA	200	150	61.9	63.2	63.4
CA	200	200	61.8	63.1	63.3
CA	200	300	61.7	63.0	63.1
CIC	50	0	62.8	64.3	64.6
CIC	50	50	62.3	63.7	64.1
CIC	50	100	62.3	63.7	64.1
CIC	50	150	62.2	63.7	64.0
CIC	50	200	62.2	63.6	64.0
CIC	50	300	61.9	63.3	63.7
CIC	100	0	62.2	63.5	63.8
CIC	100	50	61.6	62.9	63.2
CIC	100	100	61.5	62.8	63.2
CIC	100	150	61.5	62.8	63.1
CIC	100	200	61.4	62.7	63.0
CIC	100	300	61.2	62.5	62.8
CIC	200	0	62.5	63.6	63.9
CIC	200	50	61.9	63.0	63.3
CIC	200	100	61.8	62.9	63.3
CIC	200	150	61.8	62.9	63.2
CIC	200	200	61.7	62.8	63.1
CIC	200	300	61.5	62.5	62.8

TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
CKW	50	0	69.1	70.1	70.2
CKW	50	50	68.7	69.7	69.8
CKW	50	100	68.6	69.6	69.7
CKW	50	150	68.6	69.6	69.7
CKW	50	200	68.6	69.6	69.7
CKW	50	300	68.2	69.2	69.3
CKW	100	0	67.1	68.2	68.3
CKW	100	50	66.5	67.7	67.7
CKW	100	100	66.4	67.6	67.6
CKW	100	150	66.4	67.6	67.6
CKW	100	200	66.3	67.5	67.5
CKW	100	300	66.1	67.2	67.3
CKW	200	0	66.3	67.6	67.5
CKW	200	50	65.8	67.1	67.0
CKW	200	100	65.7	67.0	66.9
CKW	200	150	65.7	67.0	66.9
CKW	200	200	65.5	66.9	66.8
CKW	200	300	65.3	66.7	66.6
CQK	50	0	64.7	65.4	65.6
CQK	50	50	63.9	64.7	64.8
CQK	50	100	64.0	64.8	65.0
CQK	50	150	64.1	64.8	65.0
CQK	50	200	64.1	64.8	65.0
CQK	50	300	63.8	64.6	64.7
CQK	100	0	63.5	64.3	64.5
CQK	100	50	62.7	63.5	63.7
CQK	100	100	62.8	63.7	63.8
CQK	100	150	62.8	63.7	63.8
CQK	100	200	62.8	63.6	63.7
CQK	100	300	62.6	63.5	63.6
CQK	200	0	63.0	63.9	64.0
CQK	200	50	62.2	63.1	63.1
CQK	200	100	62.3	63.2	63.3
CQK	200	150	62.3	63.2	63.3
CQK	200	200	62.3	63.1	63.2
CQK	200	300	62.1	63.0	63.1

TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
EPR	50	0	69.6	70.4	70.3
EPR	50	50	69.1	69.9	69.9
EPR	50	100	69.1	69.9	69.8
EPR	50	150	68.9	69.7	69.7
EPR	50	200	68.9	69.7	69.7
EPR	50	300	68.5	69.3	69.2
EPR	100	0	66.9	67.7	67.7
EPR	100	50	66.5	67.3	67.2
EPR	100	100	66.4	67.2	67.2
EPR	100	150	66.2	67.0	66.9
EPR	100	200	66.1	67.0	66.9
EPR	100	300	65.8	66.7	66.6
EPR	200	0	64.7	65.7	65.5
EPR	200	50	64.4	65.3	65.2
EPR	200	100	64.2	65.1	65.0
EPR	200	150	64.0	65.0	64.8
EPR	200	200	63.9	64.8	64.7
EPR	200	300	63.6	64.6	64.4
KAQ	50	0	64.8	65.7	66.1
KAQ	50	50	64.2	65.1	65.4
KAQ	50	100	64.3	65.2	65.6
KAQ	50	150	64.2	65.1	65.4
KAQ	50	200	64.1	65.0	65.4
KAQ	50	300	63.8	64.7	65.1
KAQ	100	0	63.7	64.5	64.9
KAQ	100	50	62.8	63.6	64.0
KAQ	100	100	63.0	63.7	64.2
KAQ	100	150	62.9	63.6	64.1
KAQ	100	200	62.9	63.6	64.0
KAQ	100	300	62.7	63.4	63.8
KAQ	200	0	63.0	63.7	64.1
KAQ	200	50	62.2	62.8	63.2
KAQ	200	100	62.4	63.0	63.4
KAQ	200	150	62.4	63.0	63.4
KAQ	200	200	62.3	62.9	63.3
KAQ	200	300	62.2	62.8	63.2

TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
KHC	50	0	64.0	64.6	64.8
KHC	50	50	63.3	63.9	64.1
KHC	50	100	63.4	64.0	64.2
KHC	50	150	63.5	64.2	64.3
KHC	50	200	63.3	64.0	64.1
KHC	50	300	63.2	63.8	64.0
KHC	100	0	62.9	63.7	63.9
KHC	100	50	62.1	62.9	63.1
KHC	100	100	62.2	63.0	63.2
KHC	100	150	62.3	63.2	63.3
KHC	100	200	62.2	63.1	63.2
KHC	100	300	62.0	62.9	63.0
KHC	200	0	62.4	63.4	63.5
KHC	200	50	61.5	62.6	62.7
KHC	200	100	61.7	62.7	62.9
KHC	200	150	61.8	62.8	63.0
KHC	200	200	61.7	62.7	62.9
KHC	200	300	61.5	62.6	62.7
KK	50	0	69.9	70.3	70.4
KK	50	50	69.5	69.9	70.0
KK	50	100	69.5	69.9	70.1
KK	50	150	69.2	69.6	69.8
KK	50	200	69.2	69.6	69.8
KK	50	300	69.0	69.4	69.5
KK	100	0	67.1	67.5	67.7
KK	100	50	66.6	67.0	67.2
KK	100	100	66.5	67.0	67.1
KK	100	150	66.4	66.9	67.0
KK	100	200	66.2	66.7	66.8
KK	100	300	66.1	66.6	66.7
KK	200	0	64.9	65.4	65.5
KK	200	50	64.2	64.8	64.8
KK	200	100	64.2	64.7	64.8
KK	200	150	64.1	64.7	64.8
KK	200	200	64.0	64.6	64.7
KK	200	300	63.8	64.4	64.5

TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
KP	50	0	72.4	72.8	72.8
KP	50	50	72.0	72.3	72.4
KP	50	100	72.1	72.4	72.4
KP	50	150	71.8	72.1	72.1
KP	50	200	71.7	72.0	72.1
KP	50	300	71.7	72.0	72.0
KP	100	0	69.0	69.4	69.4
KP	100	50	68.5	68.9	68.9
KP	100	100	68.4	68.8	68.8
KP	100	150	68.2	68.6	68.7
KP	100	200	68.1	68.6	68.6
KP	100	300	68.0	68.4	68.4
KP	200	0	66.1	66.6	66.6
KP	200	50	65.5	66.1	66.1
KP	200	100	65.3	65.9	65.9
KP	200	150	65.2	65.8	65.7
KP	200	200	65.1	65.7	65.6
KP	200	300	64.9	65.5	65.5
KW	50	0	71.1	71.8	71.7
KW	50	50	70.7	71.4	71.3
KW	50	100	70.8	71.5	71.4
KW	50	150	70.5	71.2	71.1
KW	50	200	70.5	71.3	71.1
KW	50	300	70.3	71.0	70.8
KW	100	0	68.3	69.1	69.0
KW	100	50	67.8	68.7	68.5
KW	100	100	67.7	68.6	68.4
KW	100	150	67.6	68.4	68.3
KW	100	200	67.5	68.4	68.2
KW	100	300	67.3	68.2	68.0
KW	200	0	66.0	67.1	66.9
KW	200	50	65.6	66.6	66.4
KW	200	100	65.4	66.4	66.2
KW	200	150	65.2	66.3	66.1
KW	200	200	65.2	66.2	66.1
KW	200	300	64.9	66.0	65.8

TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
OAK	50	0	70.6	70.9	71.4
OAK	50	50	70.1	70.4	70.9
OAK	50	100	70.1	70.4	70.9
OAK	50	150	70.1	70.4	70.9
OAK	50	200	70.0	70.3	70.8
OAK	50	300	69.6	69.9	70.4
OAK	100	0	67.4	67.8	68.3
OAK	100	50	66.9	67.3	67.7
OAK	100	100	66.8	67.2	67.7
OAK	100	150	66.6	67.1	67.5
OAK	100	200	66.5	66.9	67.4
OAK	100	300	66.4	66.8	67.3
OAK	200	0	64.6	65.2	65.6
OAK	200	50	64.0	64.6	65.0
OAK	200	100	63.8	64.4	64.9
OAK	200	150	63.7	64.3	64.7
OAK	200	200	63.5	64.2	64.6
OAK	200	300	63.3	64.0	64.4
PK	50	0	65.5	67.7	67.3
PK	50	50	65.1	67.3	66.9
PK	50	100	65.1	67.4	66.9
PK	50	150	65.0	67.2	66.8
PK	50	200	65.0	67.2	66.8
PK	50	300	64.7	66.9	66.5
PK	100	0	63.9	65.7	65.4
PK	100	50	63.3	65.2	64.8
PK	100	100	63.3	65.1	64.8
PK	100	150	63.2	65.0	64.7
PK	100	200	63.2	65.0	64.6
PK	100	300	62.9	64.7	64.3
PK	200	0	62.7	64.2	63.9
PK	200	50	62.2	63.7	63.3
PK	200	100	62.2	63.6	63.3
PK	200	150	62.1	63.5	63.2
PK	200	200	62.0	63.4	63.1
PK	200	300	61.8	63.2	62.9

TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
PKP	50	0	69.8	70.4	70.0
PKP	50	50	69.4	70.1	69.6
PKP	50	100	69.4	70.0	69.5
PKP	50	150	69.3	69.9	69.4
PKP	50	200	69.1	69.8	69.3
PKP	50	300	68.9	69.5	69.0
PKP	100	0	67.4	68.2	67.8
PKP	100	50	66.9	67.7	67.3
PKP	100	100	66.8	67.6	67.2
PKP	100	150	66.7	67.5	67.1
PKP	100	200	66.5	67.3	66.9
PKP	100	300	66.3	67.1	66.7
PKP	200	0	65.5	66.4	66.1
PKP	200	50	64.9	65.8	65.5
PKP	200	100	64.8	65.7	65.4
PKP	200	150	64.6	65.5	65.3
PKP	200	200	64.5	65.4	65.2
PKP	200	300	64.3	65.2	64.9
PP	50	0	67.8	68.4	68.4
PP	50	50	67.3	67.9	67.9
PP	50	100	67.1	67.7	67.7
PP	50	150	67.0	67.6	67.6
PP	50	200	66.8	67.4	67.4
PP	50	300	66.6	67.2	67.2
PP	100	0	66.2	66.8	66.9
PP	100	50	65.7	66.3	66.4
PP	100	100	65.6	66.1	66.2
PP	100	150	65.4	66.0	66.1
PP	100	200	65.3	65.8	65.9
PP	100	300	64.9	65.5	65.6
PP	200	0	64.8	65.4	65.6
PP	200	50	64.3	64.9	65.1
PP	200	100	64.2	64.8	65.0
PP	200	150	64.1	64.7	64.9
PP	200	200	64.0	64.6	64.7
PP	200	300	63.7	64.3	64.5

TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
PQ	50	0	66.5	67.8	67.7
PQ	50	50	66.0	67.3	67.2
PQ	50	100	65.9	67.2	67.1
PQ	50	150	65.9	67.2	67.1
PQ	50	200	65.8	67.1	67.0
PQ	50	300	65.5	66.8	66.7
PQ	100	0	64.9	65.9	65.9
PQ	100	50	64.3	65.4	65.3
PQ	100	100	64.2	65.3	65.3
PQ	100	150	64.2	65.3	65.2
PQ	100	200	64.1	65.1	65.1
PQ	100	300	63.8	64.9	64.8
PQ	200	0	64.0	64.9	64.8
PQ	200	50	63.3	64.3	64.3
PQ	200	100	63.3	64.2	64.2
PQ	200	150	63.3	64.2	64.2
PQ	200	200	63.2	64.1	64.0
PQ	200	300	63.0	63.9	63.8
QW	50	0	66.0	67.0	66.9
QW	50	50	65.6	66.7	66.5
QW	50	100	65.6	66.6	66.4
QW	50	150	65.6	66.7	66.5
QW	50	200	65.5	66.5	66.3
QW	50	300	65.1	66.1	65.9
QW	100	0	64.6	65.5	65.4
QW	100	50	64.1	65.0	64.9
QW	100	100	64.1	65.0	64.9
QW	100	150	64.1	65.0	64.9
QW	100	200	63.9	64.8	64.7
QW	100	300	63.8	64.6	64.5
QW	200	0	63.4	64.1	64.1
QW	200	50	62.8	63.5	63.5
QW	200	100	62.9	63.6	63.6
QW	200	150	62.9	63.6	63.6
QW	200	200	62.7	63.5	63.5
QW	200	300	62.5	63.3	63.3

TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
SAK	50	0	71.0	71.4	71.7
SAK	50	50	70.6	70.9	71.3
SAK	50	100	70.6	70.9	71.2
SAK	50	150	70.5	70.9	71.2
SAK	50	200	70.3	70.6	71.0
SAK	50	300	70.0	70.4	70.7
SAK	100	0	68.0	68.4	68.7
SAK	100	50	67.4	67.8	68.1
SAK	100	100	67.3	67.8	68.1
SAK	100	150	67.3	67.7	68.0
SAK	100	200	67.1	67.5	67.8
SAK	100	300	66.9	67.3	67.6
SAK	200	0	65.5	66.1	66.4
SAK	200	50	64.7	65.4	65.7
SAK	200	100	64.7	65.4	65.6
SAK	200	150	64.6	65.3	65.5
SAK	200	200	64.5	65.2	65.4
SAK	200	300	64.2	64.9	65.1
SKC	50	0	69.4	70.3	70.5
SKC	50	50	69.1	70.0	70.2
SKC	50	100	68.9	69.8	70.0
SKC	50	150	68.8	69.8	69.9
SKC	50	200	68.6	69.6	69.7
SKC	50	300	68.6	69.5	69.7
SKC	100	0	67.5	68.5	68.6
SKC	100	50	67.0	68.0	68.1
SKC	100	100	66.8	67.8	67.9
SKC	100	150	66.8	67.7	67.9
SKC	100	200	66.7	67.6	67.7
SKC	100	300	66.4	67.4	67.5
SKC	200	0	66.6	67.6	67.6
SKC	200	50	66.0	67.0	67.1
SKC	200	100	65.8	66.9	66.9
SKC	200	150	65.7	66.8	66.8
SKC	200	200	65.6	66.6	66.7
SKC	200	300	65.4	66.4	66.4

TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
WAK	50	0	70.8	70.8	71.8
WAK	50	50	70.4	70.4	71.4
WAK	50	100	70.3	70.4	71.4
WAK	50	150	70.2	70.2	71.2
WAK	50	200	70.2	70.2	71.2
WAK	50	300	69.9	69.9	70.9
WAK	100	0	67.8	68.0	68.9
WAK	100	50	67.3	67.4	68.3
WAK	100	100	67.2	67.3	68.2
WAK	100	150	67.0	67.2	68.1
WAK	100	200	67.0	67.1	68.0
WAK	100	300	66.7	66.9	67.8
WAK	200	0	65.7	66.2	66.9
WAK	200	50	65.1	65.7	66.3
WAK	200	100	64.9	65.4	66.1
WAK	200	150	64.7	65.3	65.9
WAK	200	200	64.6	65.2	65.8
WAK	200	300	64.4	65.0	65.6
WKP	50	0	69.9	70.0	70.1
WKP	50	50	69.5	69.6	69.7
WKP	50	100	69.5	69.6	69.7
WKP	50	150	69.3	69.4	69.5
WKP	50	200	69.2	69.4	69.4
WKP	50	300	69.2	69.3	69.4
WKP	100	0	67.2	67.5	67.5
WKP	100	50	66.7	67.0	67.0
WKP	100	100	66.5	66.8	66.9
WKP	100	150	66.4	66.7	66.7
WKP	100	200	66.2	66.6	66.6
WKP	100	300	66.1	66.5	66.5
WKP	200	0	64.8	65.3	65.3
WKP	200	50	64.3	64.8	64.8
WKP	200	100	64.0	64.6	64.5
WKP	200	150	63.9	64.5	64.5
WKP	200	200	63.8	64.4	64.3
WKP	200	300	63.6	64.2	64.1

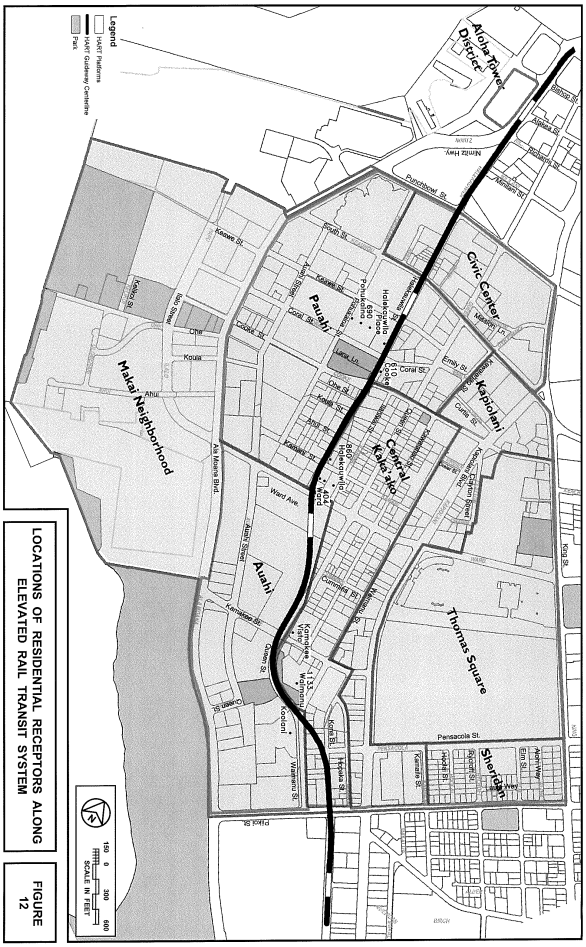
TABLE 8 (CONTINUED)
CALCULATIONS OF EXISTING AND FUTURE TRAFFIC
NOISE LEVELS AT ELEVATED RECEPTOR LOCATIONS

RECEPTOR NAME	RECEPTOR DISTANCE TO ROADWAY CENERLINE (FT)	RECEPTOR ELEVATION ABOVE GROUND (FT)	EXISTING DNL	FUTURE BASELINE DNL	FUTURE ALT. A DNL
WW	50	0	66.4	67.8	67.7
WW	50	50	65.8	67.2	67.1
WW	50	100	66.0	67.4	67.2
WW	50	150	66.0	67.4	67.2
WW	50	200	65.9	67.3	67.1
WW	50	300	65.4	66.8	66.7
WW	100	0	65.1	66.5	66.4
WW	100	50	64.4	65.8	65.7
WW	100	100	64.6	66.0	65.9
WW	100	150	64.6	66.0	65.9
WW	100	200	64.5	65.9	65.8
WW	100	300	64.3	65.7	65.6
WW	200	0	64.1	65.4	65.4
WW	200	50	63.3	64.6	64.6
WW	200	100	63.6	64.9	64.8
WW	200	150	63.5	64.9	64.8
WW	200	200	63.5	64.8	64.7
WW	200	300	63.3	64.6	64.5

- At Uraku Tower, rail noise levels were predicted to range from 63 DNL to 61 DNL or less without soundwalls or wheel skirts. With "current design", predicted rail noise levels ranged from 61 DNL to 60 DNL or less. The use of 3 feet high sidewalls did not seem to be included in the "current design".

No rail transit system noise level predictions were provided in References 33 or 34 for Halekauwila Place, which is currently under construction or for Kamakee Vista, 1133 Waimanu, and Koolani, which are existing high-rise condominiums located within 200 feet of the rail baseline. Another high-rise development (404 Ward; Star-Advertiser, June 3, 2013) is also planned along the rail transit route at the corner of Halekauwila Street and Ward Avenue. For the three existing condominiums listed above plus the existing 610 Cooke Street mid-rise apartments and the 860 Halekauwila high-rise plus Halekauwila Place (which is under construction), predictions of future traffic plus rail transit system noise levels were performed to describe the existing and future total noise levels at the multifamily dwelling units along the rail transit corridor. The locations of these dwelling units are shown in Figure 12. The results of the existing, Future Baseline, and Future Alternative A traffic plus rail transit system noise levels at ground level and elevated receptors are shown in Table 9.

The results shown in Table 9 indicate that a buffer distance of approximately 192 feet from the elevated guideway centerline will be required in order to minimize the influence of the rail transit system noise contributions on exceedances of the 65 DNL federal noise standard due to the combined contributions from both rail and motor vehicle traffic noise. At dwelling units located within 120 feet of the guideway centerline, the rail transit system can be the dominant noise source if mitigation measures are not incorporated into the rail transit system design. Without mitigation measures, the rail transit system noise levels are expected to be similar to motor vehicle traffic noise levels along King Street or Ala Moana Boulevard in 2035 under Alternative A.



LOCATIONS OF RESIDENTIAL RECEPTORS ALONG ELEVATED RAIL TRANSIT SYSTEM

FIGURE 12

TABLE 9
CALCULATIONS OF FUTURE TOTAL NOISE LEVELS AT RESIDENTIAL RECEPTOR LOCATIONS ALONG ELEVATED RAIL TRANSIT SYSTEM

RECEPTOR NAME	RECEPT. BASE ELEV (FT)	HORIZ. DIST. TO RAIL (FT)	RAIL ELEV (FT)	RAIL DNL W/O MITI-GATION	RAIL DNL WITH MITI-GATION	FUTURE TRAFFIC NOISE BASELINE	FUTURE TRAFFIC NOISE ALT. A	* W/O RAIL MITIGATION * TOTAL DNL BASELINE	TOTAL DNL ALT. A	** WITH RAIL MITIGATION * TOTAL DNL BASELINE	TOTAL DNL ALT. A
Koolani @ 57'	0	57	35	69.7	57.2	66.8	66.6	71.5	71.4	67.3	67.1
Koolani @ 57'	50	57	35	70.1	58.9	66.5	66.3	71.7	71.6	67.2	67.0
Koolani @ 57'	100	57	35	67.5	57.1	66.4	66.2	70.0	69.9	66.9	66.7
Koolani @ 57'	150	57	35	65.0	55.1	66.4	66.2	68.8	68.7	66.7	66.5
Koolani @ 57'	200	57	35	63.1	54.5	66.3	66.1	68.0	67.9	66.6	66.4
Koolani @ 57'	300	57	35	60.3	58.3	65.8	65.7	66.9	66.8	66.5	66.4
1133 Waimanu @ 192'	0	192	37	62.5	50.0	64.7	64.7	66.8	66.8	64.8	64.8
1133 Waimanu @ 192'	50	192	37	62.6	51.4	64.0	64.0	66.4	66.4	64.2	64.2
1133 Waimanu @ 192'	100	192	37	62.2	51.8	64.1	64.1	66.3	66.3	64.4	64.4
1133 Waimanu @ 192'	150	192	37	61.6	51.7	64.2	64.1	66.1	66.0	64.4	64.3
1133 Waimanu @ 192'	200	192	37	60.8	52.2	64.1	64.0	65.8	65.7	64.4	64.3
1133 Waimanu @ 192'	250	192	37	59.9	57.9	64.0	63.9	65.4	65.4	65.0	64.9
Kamakee Vista @ 120'	0	120	39	65.4	52.9	65.4	65.7	68.4	68.6	65.6	65.9
Kamakee Vista @ 120'	50	120	39	65.6	54.4	64.7	65.1	68.2	68.4	65.1	65.5
Kamakee Vista @ 120'	100	120	39	64.8	54.4	64.7	65.1	67.8	68.0	65.1	65.5
Kamakee Vista @ 120'	150	120	39	63.5	53.6	64.7	65.1	67.2	67.4	65.0	65.4
Kamakee Vista @ 120'	200	120	39	62.2	53.6	64.7	65.0	66.6	66.8	65.0	65.3
Kamakee Vista @ 120'	250	120	39	61.0	59.0	64.6	64.9	66.2	66.4	65.7	65.9

TABLE 9 (CONTINUED)
CALCULATIONS OF FUTURE TOTAL NOISE LEVELS
AT RESIDENTIAL RECEPTOR LOCATIONS ALONG ELEVATED
RAIL TRANSIT SYSTEM

RECEPTOR NAME	RECEPT. BASE ELEV (FT)	HORIZ. DIST. TO RAIL (FT)	RAIL ELEV (FT)	RAIL DNL W/O MITI-GATION	RAIL DNL WITH MITI-GATION	FUTURE TRAFFIC NOISE BASELINE	FUTURE TRAFFIC NOISE ALT. A	* W/O RAIL MITIGATION ** WITH RAIL MITIGATION * TOTAL DNL BASELINE	TOTAL DNL ALT. A	TOTAL DNL BASELINE	TOTAL DNL ALT. A
860 Halekauwila @ 45'	0	45	30	71.2	58.7	65.8	65.8	72.3	72.3	66.6	66.6
860 Halekauwila @ 45'	50	45	30	71.2	60.0	65.1	65.0	72.1	72.1	66.3	66.2
860 Halekauwila @ 45'	100	45	30	67.7	57.3	65.4	65.3	69.7	69.7	66.0	65.9
860 Halekauwila @ 45'	150	45	30	65.0	55.1	65.3	65.3	68.2	68.2	65.7	65.7
860 Halekauwila @ 45'	200	45	30	63.0	54.4	65.2	65.1	67.3	67.2	65.5	65.5
860 Halekauwila @ 45'	250	45	30	61.5	59.5	65.1	65.0	66.7	66.6	66.1	66.1
610 Cooke St. @ 33'	0	33	33	72.3	59.8	66.9	67.2	73.4	73.5	67.7	67.9
610 Cooke St. @ 33'	10	33	33	73.2	62.0	66.7	67.0	74.1	74.1	68.0	68.2
610 Cooke St. @ 33'	20	33	33	73.9	63.5	66.7	67.0	74.6	74.7	68.4	68.6
610 Cooke St. @ 33'	30	33	33	74.0	64.1	66.6	66.9	74.8	74.8	68.6	68.7
610 Cooke St. @ 33'	40	33	33	73.7	65.1	66.4	66.8	74.4	74.5	68.8	69.0
Halekauwila Place @ 42'	0	42	35	71.1	58.6	65.0	65.1	72.1	72.1	65.9	66.0
Halekauwila Place @ 42'	50	42	35	71.8	60.6	64.4	64.6	72.5	72.6	65.9	66.1
Halekauwila Place @ 42'	100	42	35	68.2	57.8	64.4	64.5	69.7	69.7	65.3	65.3
Halekauwila Place @ 42'	150	42	35	65.3	55.4	64.5	64.7	67.9	68.0	65.0	65.2
Halekauwila Place @ 42'	200	42	35	63.2	54.6	64.4	64.6	66.9	67.0	64.8	65.0
Halekauwila Place @ 42'	250	42	35	61.6	59.6	64.3	64.4	66.2	66.2	65.6	65.6

CHAPTER VII. DISCUSSION OF PROJECT-RELATED NOISE AND VIBRATION IMPACTS AND POSSIBLE MITIGATION MEASURES

Traffic Noise. Noise impacts from project related traffic along the roadways which are expected to service the project area are not expected since traffic noise increases associated with project traffic are not significant. Future traffic noise impacts at future residential units within the mauka neighborhoods of KCDD can occur if these residential units are located in areas with traffic noise levels which exceed the 65 DNL FHA/HUD standard for noise sensitive properties. Traffic noise mitigation measures would be required in these situations, particularly if FHA/HUD participation is involved with these developments. In general, these areas where the risk of exceeding the 65 DNL FHA/HUD standard for noise sensitive properties is high occur along the major traffic corridors.

The planned 690 Pohukaina Project (on the mauka side of Pohukaina Street between Keawe and Coral Streets) is located in a relatively low noise level area in the Pauahi Neighborhood (see Figure 12). Predictions of future traffic noise levels for Baseline and Alternative A Scenarios on the 690 Pohukaina Project site at 50, 150, and 250 feet from the centerline of Pohukaina Street are shown in Table 10. These receptor locations are indicated as being 430, 330, and 230 feet, respectively, from the centerline of the rail transit system, and range from ground level to 700 feet above ground level. Based on the results shown in the seventh and eighth columns of Table 10, it was concluded that motor vehicle traffic noise levels are not expected to exceed the 65 DNL FHA/HUD standard for noise sensitive properties at the receptor locations shown in Figure 12 and Table 10.

The possible 404 Ward Project (on the Ewa side of Ward Avenue at Halekauwila Street) is located in a relatively high noise level area in the Central Kaka'ako Neighborhood (see Figure 12). Predictions of future traffic noise levels for Baseline and Alternative A Scenarios on the 404 Ward Project site at 50, 100, and 200 feet from the centerline of Halekauwila Street are shown in Table 10. These receptor locations are indicated as being 50, 100, and 200 feet from the centerline of the rail transit system, and range from ground level to 300 feet above ground level. Based on the results shown in the seventh and eighth columns of Table 10, it was concluded that motor vehicle traffic noise levels will probably exceed the 65 DNL FHA/HUD standard for noise sensitive properties at the receptor locations shown in Figure 12 and Table 10.

Elevated Transit (Rail) System Noise. By 2035, the elevated transit system which crosses through the middle of the TOD study area will probably have a general effect of reducing the future increases in road traffic noise levels in the study area, and increasing the future background noise levels along the transit system corridor. The added noise levels from the transit system along that corridor will need to be considered as an added noise source which could cause total noise levels at noise sensitive properties to exceed the 65 DNL FHA/HUD standard. Because the transit system corridor is located within the quieter areas of the TOD study area, the noise level contributions from the elevated rail system can cause total background noise levels to

TABLE 10
CALCULATIONS OF FUTURE TOTAL NOISE LEVELS
AT ELEVATED RECEPTOR LOCATIONS ON 690 POHUKAINA
AND 404 WARD PROJECT SITES

RECEPTOR NAME	RECEPT. BASE ELEV (FT)	HORIZ. DIST. TO RAIL (FT)	RAIL ELEV (FT)	RAIL DNL W/O MITI-GATION	RAIL DNL WITH MITI-GATION	FUTURE TRAFFIC NOISE BASELINE	FUTURE TRAFFIC NOISE ALT. A	* W/O RAIL MITIGATION * TOTAL DNL BASELINE	TOTAL DNL ALT. A	* WITH RAIL MITIGATION * TOTAL DNL BASELINE	TOTAL DNL ALT. A
690 Pohukaina @ 50'	0	430	35	57.4	44.9	64.6	64.4	65.4	65.2	64.6	64.4
690 Pohukaina @ 50'	50	430	35	57.4	46.4	63.9	63.7	64.8	64.6	64.0	63.8
690 Pohukaina @ 50'	100	430	35	57.3	46.9	64.1	63.8	64.9	64.7	64.2	63.9
690 Pohukaina @ 50'	150	430	35	57.1	47.3	64.2	63.9	65.0	64.7	64.3	64.0
690 Pohukaina @ 50'	200	430	35	56.9	48.6	64.1	63.9	64.9	64.7	64.2	64.0
690 Pohukaina @ 50'	300	430	35	56.3	54.3	63.7	63.5	64.4	64.3	64.2	64.0
690 Pohukaina @ 50'	400	430	35	55.6	53.6	63.4	63.2	64.1	63.9	63.8	63.6
690 Pohukaina @ 50'	500	430	35	54.8	52.8	63.0	62.9	63.6	63.5	63.4	63.3
690 Pohukaina @ 50'	700	430	35	53.4	51.4	62.5	62.4	63.0	62.9	62.8	62.7
690 Pohukaina @ 150'	0	330	35	59.1	46.5	63.0	63.0	64.5	64.5	63.1	63.1
690 Pohukaina @ 150'	50	330	35	59.1	48.1	62.1	62.1	63.9	63.9	62.3	62.3
690 Pohukaina @ 150'	100	330	35	59.0	48.8	62.3	62.3	64.0	64.0	62.5	62.5
690 Pohukaina @ 150'	150	330	35	58.7	49.7	62.4	62.4	63.9	63.9	62.6	62.6
690 Pohukaina @ 150'	200	330	35	58.3	55.3	62.4	62.4	63.8	63.8	63.2	63.2
690 Pohukaina @ 150'	300	330	35	57.4	55.4	62.2	62.2	63.4	63.4	63.0	63.0
690 Pohukaina @ 150'	400	330	35	56.4	54.4	62.1	62.1	63.1	63.1	62.8	62.8
690 Pohukaina @ 150'	500	330	35	55.5	53.5	61.9	61.9	62.8	62.8	62.5	62.5
690 Pohukaina @ 150'	700	330	35	53.8	51.8	61.6	61.6	62.3	62.3	62.0	62.0
690 Pohukaina @ 250'	0	230	35	61.4	48.5	62.7	62.8	65.1	65.2	62.9	63.0
690 Pohukaina @ 250'	50	230	35	61.4	50.6	61.8	61.9	64.6	64.7	62.1	62.2
690 Pohukaina @ 250'	100	230	35	61.2	51.6	62.0	62.1	64.6	64.7	62.4	62.5
690 Pohukaina @ 250'	150	230	35	60.7	58.7	62.2	62.3	64.5	64.6	63.8	63.9
690 Pohukaina @ 250'	200	230	35	60.0	58.0	62.1	62.2	64.2	64.3	63.5	63.6
690 Pohukaina @ 250'	300	230	35	58.6	56.6	61.9	62.0	63.6	63.6	63.0	63.1
690 Pohukaina @ 250'	400	230	35	57.3	55.3	61.8	61.9	63.1	63.2	62.7	62.8
690 Pohukaina @ 250'	500	230	35	56.1	54.1	61.7	61.8	62.8	62.8	62.4	62.5
690 Pohukaina @ 250'	700	230	35	54.1	52.1	61.4	61.5	62.1	62.2	61.9	62.0

TABLE 10 (CONTINUED)
CALCULATIONS OF FUTURE TOTAL NOISE LEVELS
AT ELEVATED RECEPTOR LOCATIONS ON 690 POHUKAINA
AND 404 WARD PROJECT SITES

RECEPTOR NAME	RECEPT. BASE ELEV (FT)	HORIZ. DIST. TO RAIL (FT)	RAIL ELEV (FT)	RAIL DNL W/O MITI-GATION	RAIL DNL WITH MITI-GATION	FUTURE TRAFFIC NOISE BASELINE	FUTURE TRAFFIC NOISE ALT. A	* W/O RAIL MITIGATION * TOTAL DNL BASELINE	TOTAL DNL ALT. A	* WITH RAIL MITIGATION * TOTAL DNL BASELINE	TOTAL DNL ALT. A
404 Ward @ 50'	0	50	35	70.3	54.7	67.3	67.1	72.1	72.0	67.5	67.3
404 Ward @ 50'	50	50	35	70.9	62.6	66.7	66.5	72.3	72.2	68.1	68.0
404 Ward @ 50'	100	50	35	67.8	65.8	66.7	66.5	70.3	70.2	69.3	69.2
404 Ward @ 50'	150	50	35	65.1	63.1	66.7	66.5	69.0	68.9	68.3	68.1
404 Ward @ 50'	200	50	35	63.1	61.1	66.5	66.3	68.1	68.0	67.6	67.5
404 Ward @ 50'	300	50	35	60.3	58.3	66.3	66.1	67.3	67.1	66.9	66.8
404 Ward @ 100'	0	100	35	66.6	52.5	66.9	66.6	69.7	69.6	67.1	66.8
404 Ward @ 100'	50	100	35	66.7	56.5	66.2	65.9	69.5	69.3	66.6	66.4
404 Ward @ 100'	100	100	35	65.6	63.6	66.2	65.9	68.9	68.7	68.1	67.9
404 Ward @ 100'	150	100	35	64.0	62.0	66.1	65.9	68.2	68.0	67.5	67.4
404 Ward @ 100'	200	100	35	62.4	60.4	66.0	65.7	67.6	67.4	67.1	66.8
404 Ward @ 100'	300	100	35	60.0	58.0	65.8	65.5	66.8	66.6	66.5	66.2
404 Ward @ 200'	0	200	35	62.3	49.2	66.7	66.4	68.0	67.8	66.8	66.5
404 Ward @ 200'	50	200	35	62.3	51.6	66.0	65.7	67.5	67.3	66.2	65.9
404 Ward @ 200'	100	200	35	62.0	52.8	66.0	65.7	67.4	67.2	66.2	65.9
404 Ward @ 200'	150	200	35	61.3	59.3	66.0	65.6	67.3	67.0	66.8	66.5
404 Ward @ 200'	200	200	35	60.6	58.6	65.8	65.5	66.9	66.7	66.6	66.3
404 Ward @ 200'	300	200	35	59.0	57.0	65.6	65.3	66.5	66.2	66.2	65.9

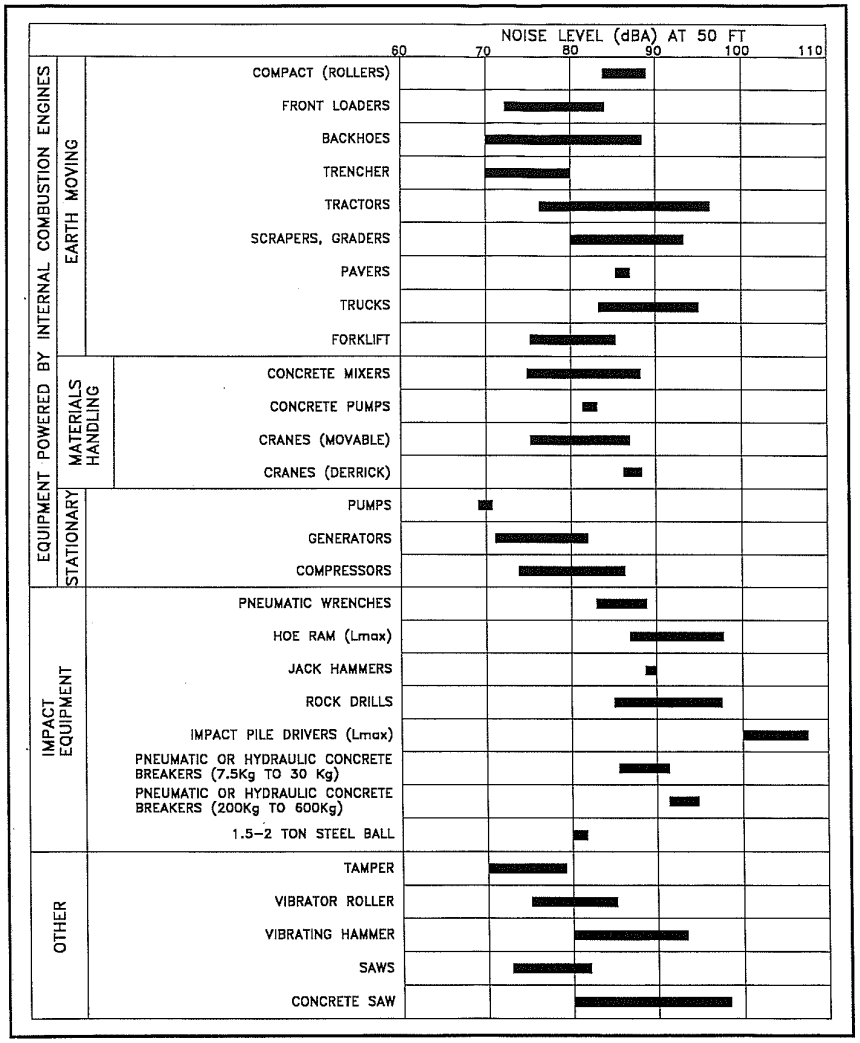
exceed the 65 DNL FHA/HUD standard, particularly where no rail noise mitigation measures are included within the transit system. For this reason, the location of noise sensitive developments at short setback distances from the rail system will probably trigger the need for the addition of sound attenuation measures at these developments.

For the elevated receptor locations shown in Figure 11 which are closest to the elevated rail corridor, the noise from the rail transit system could make significant contributions to the future total noise levels at the following locations: BNA, KHC, AHK, CQK, and QW. These five locations are all adjacent to the rail corridor. The noise from the rail transit system should not make significant contributions to the future total noise levels at the following locations: PQ, PP, KAQ, and PKP. All of these four locations are at least 250 feet from the rail centerline.

The elevated transit system is not expected to raise total (traffic plus rail) noise levels above the 65 DNL FHA/HUD standard at the 690 Pohukaina Project with or without rail noise mitigation (see Table 10). This is due to the large setback distance of the 690 Pohukaina Project from the rail alignment and the additional noise shielding effects from the Halekauwila Place building. The elevated transit system is expected to contribute to exceedances of the 65 DNL FHA/HUD standard at the 404 Ward Project with or without rail noise mitigation (see Table 10).

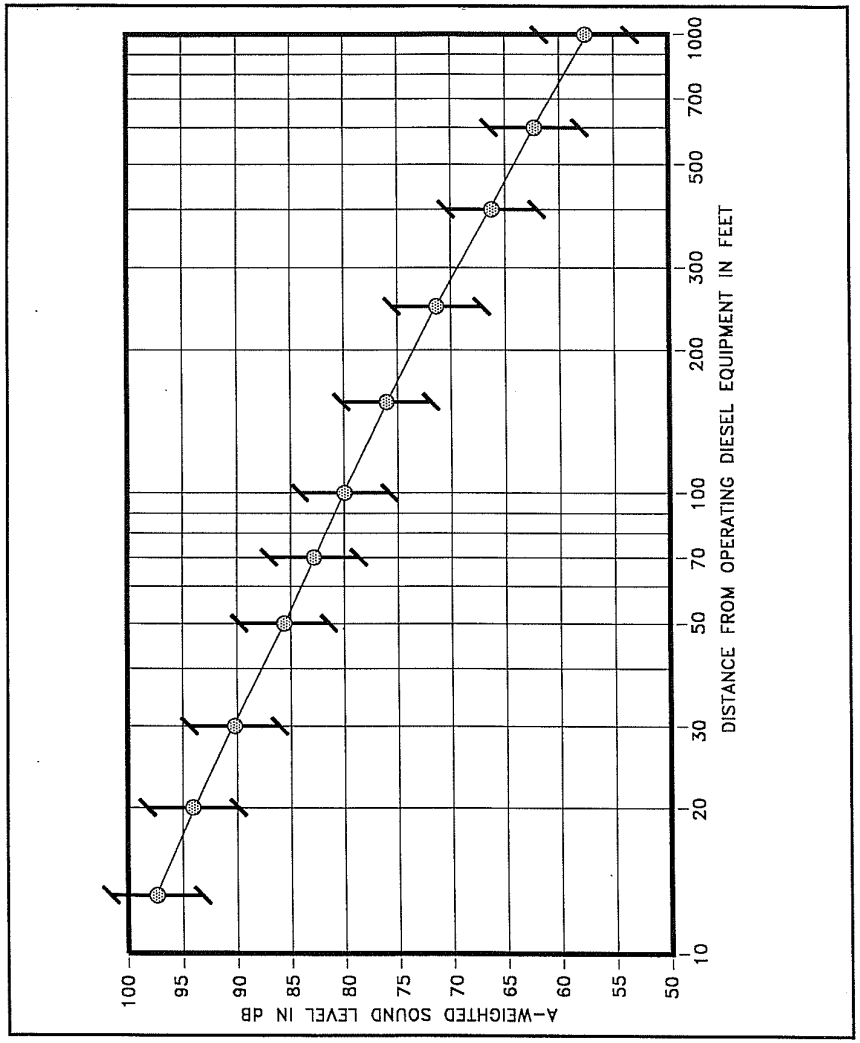
Noise Mitigation Measures. Noise mitigation measures for residential units located in areas with exterior noise levels which exceed the 65 DNL FHA/HUD noise standard will typically involve the use of closure and air conditioning. The use of sound attenuating walls or barriers will be of limited effectiveness, particularly where mid-rise and high-rise developments are involved. It should be noted that the erection of mid- and high-rise buildings adjacent to roadways or the elevated rail corridor will serve as partial sound barriers to properties which are located behind these buildings. However, as the density of these mid-and high-rise structures increase along a transportation corridor, their reflective surfaces will tend to increase the background noise levels along the transportation corridor. So, the use of closure and air conditioning will probably be the only available noise mitigation measure for noise sensitive developments located within the high noise zones.

General Construction Noise. Audible construction noise will probably be unavoidable during the entire project construction period of new developments within the study area. The total time period for construction will probably vary among the various projects, and it is anticipated that the actual work will be moving from one location on any project site to another during that period. Actual length of exposure to construction noise at any receptor location will probably be less than the total construction period for the entire project. Figure 13 depicts the range of noise levels of various types of construction equipment when measured at 50 FT distance from the equipment. Typical levels of exterior noise from construction activity (excluding pile driving activity) at various distances from the job site are shown in Figure 14. The



RANGES OF CONSTRUCTION EQUIPMENT NOISE LEVELS

FIGURE 13



ANTICIPATED RANGE OF CONSTRUCTION NOISE LEVELS VS. DISTANCE

FIGURE 14

impulsive noise levels of impact pile drivers are approximately 15 dB higher than the levels shown in Figure 14, while the intermittent noise levels of vibratory pile drivers are at the upper end of the noise level ranges depicted in the figure.

Figure 14 is useful for predicting exterior noise levels at short distances (within 100 FT) from the work when visual line of sight exists between the construction equipment and the receptor. Direct line-of-sight distances from the construction equipment to existing and future residential and commercial buildings will probably range from 20 FT to 1,300 FT, with corresponding average noise levels of 94 to 55 dBA (plus or minus 5 dBA). For receptors along a cross-street, the construction noise level vs. distance curve of Figure 14 should be reduced by approximately 8 dBA when the work is occurring at the intersection with the cross street, and should be reduced by 15 dBA when work is occurring at least 100 FT from the intersection (and the visual line-of-sight is blocked by intervening buildings). Typical levels of construction noise inside naturally ventilated and air conditioned structures are approximately 10 and 20 dB less, respectively, than the levels shown in Figure 14.

Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for regulation of construction noise. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the construction site. Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources (80 to 90+ dB at 50 FT distance), and due to the exterior nature of the work (pile driving, grading and earth moving, trenching, concrete pouring, hammering, etc.). The use of properly muffled construction equipment should be required on the job site.

Peak airborne noise levels from pile diving may be as much as 15 dBA greater than noise levels shown in Figure 14 for non-impulsive (steady) construction noise sources. Although the pile driving can produce more intense noise levels, each pulse is of short individual duration (less than one second). Therefore, its impact on speech communication is not as severe as that of a steady source of the same noise level.

Severe noise impacts are not expected to occur inside air conditioned structures which are within 50 to 450+ FT of the project construction site. Inside naturally ventilated structures, interior noise levels (with windows or doors opened) are estimated to range between 55 to 76 dBA at 50 FT to 450+ FT distances from the construction site. Closure of all doors and windows facing the construction site would generally reduce interior noise levels by an additional 5 to 10 dBA.

The incorporation of State Department of Health construction noise limits and curfew times, which are applicable throughout the State of Hawaii (Reference 4), is another noise mitigation measure which is normally applied to construction activities. Figure 15 depicts the normally permitted hours of construction. Noisy construction

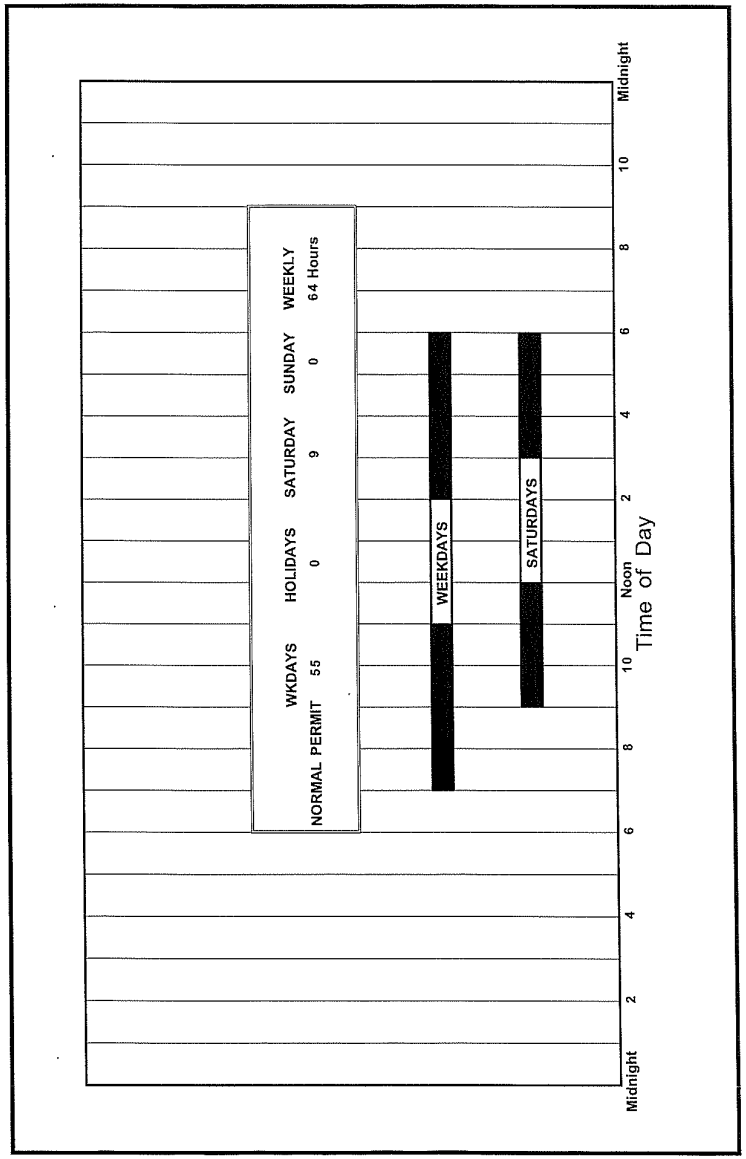


FIGURE 15

AVAILABLE WORK HOURS UNDER DOH PERMIT PROCEDURES FOR CONSTRUCTION NOISE

activities are not allowed on Sundays and holidays, during the early morning, and during the late evening and nighttime periods under the DOH permit procedures.

Vibration from Pile Driving. Pile driving may be necessary to implant piles into the ground at some construction sites. Impact driven concrete and sheet piles may both be used at a construction site. Induced ground vibrations from the pile driving operations have the potential to cause architectural and structural damage to nearby structures.

Ground vibrations generated during pile driving operations are generally described in terms of peak particle (or ground) velocity in units of inches/second. The human being is very sensitive to ground vibrations, which are perceptible at relatively low particle velocities of 0.01 to 0.04 inches/second. Damage to structures, however, occur at much higher levels of vibration as indicated in Table 11. The most commonly used damage criteria for structures is the 2.0 inches/second limit derived from work by the U.S. Bureau of Mines. A more conservative limit of 0.2 inches/second is also used, and is suggested for planning purposes on this project because of the repetitive nature of pile driving operations which can increase risks of damage due to fatiguing.

Based on measured vibration levels during pile driving operations under various soil conditions and at various distances, estimates of ground vibration levels vs. distance from the pile driver have been made for various soil conditions and for various energy ratings of the pile drivers. Figure 16, which was extracted from Reference 35, may be used to predict vibration levels for the soil conditions indicated. When coral layers must be penetrated, vibration levels can be expected to be higher than those shown in Figure 16, particularly if the adjacent structures are supported by the common coral layer. From Figure 16, and for wet sand soil conditions, the 0.2 inches/second vibration damage criteria will be exceeded at a scaled energy distance factor of approximately 0.7. The scaled energy distance factor is equal to the square root of the energy (in foot-pounds) per blow of the hammer divided by the distance (in feet) between the pile tip and the monitoring location. For a 22,400 foot-pound pile driver, a scaled energy distance of 0.7 equates to a required separation distance of 214 feet. Under clay soil conditions, and using the prediction procedures contained in Figure 16, a shorter separation distance of 100 feet is required to not exceed the 0.2 inches/second criteria when using a 22,400 foot-pound pile driver. It should be noted that 0.2 inches/second vibration levels were measured from a 22,400 foot-pound pile driver at even shorter separation distances of approximately 30 FT in sandy, layered soil (Reference 36). The measurement data reported in Reference 36 are significantly lower than the vibration levels predicted by the methodology of Reference 35.

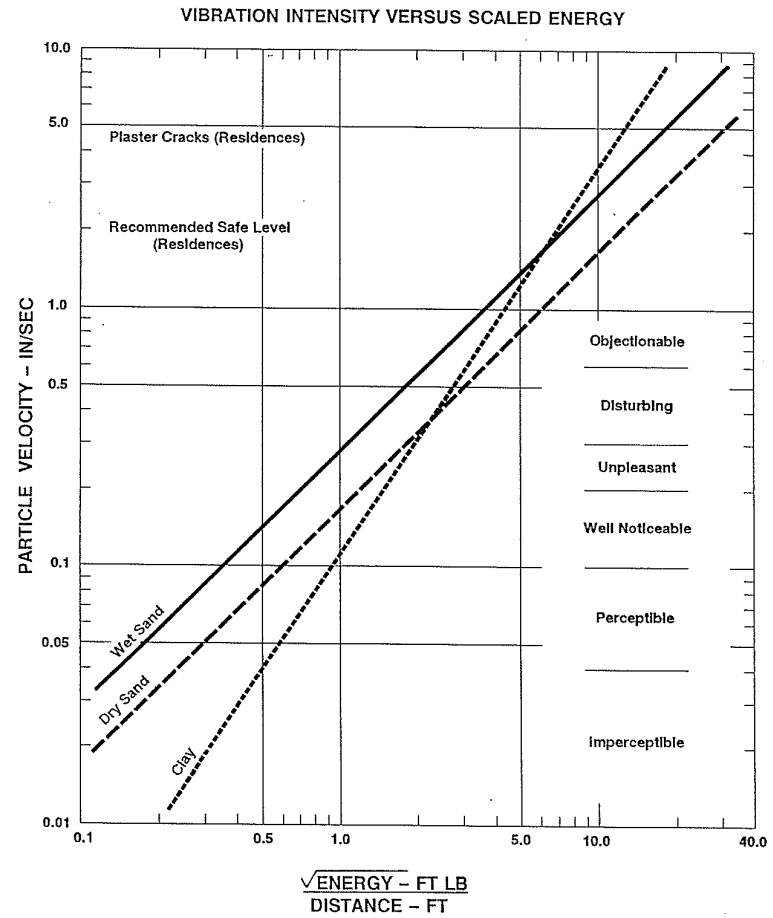
As indicated above, predictions of peak ground vibration levels vs. scaled energy distance factor from the driven pile are not precise, with initial uncertainty factor for a given location in the order of 10:1. For this reason, it is standard practice to employ seismograph monitoring of ground vibrations during pile driving operations with a 3-axis geophone or accelerometer. If sheet pile drivers of approximately 2,500 foot-pounds or

TABLE 11

SUMMARY OF BUILDING DAMAGE CRITERIA

PEAK GROUND VELOCITY (mm/sec)	PEAK GROUND VELOCITY (in/sec)	COMMENT
193.04	7.6	Major damage to buildings (mean of data).
137.72	5.4	Minor damage to buildings (mean of data).
101.16	4.0	'Engineer structures' safe from damage.
50.8	2.0	Safe from damage limit (probability of damage <5%).
		No structural damage.
33.02	1.3	Threshold of risk of 'architectural' damage for houses.
25.4	1.0	No data showing damage to structures for vibration <1 in./sec.
15.24	0.6	No risk of 'architectural' damage to normal buildings.
10.16	0.4	Threshold of damage in older homes.
5.08	0.2	Statistically significant percentage of structures may experience minor damage (including earthquake, nuclear event, and blast data for old and new structures).
		No 'architectural' damage.
3.81	0.5 to 0.15	Upper limits for ruins and ancient monuments.
1.0	0.04	Vertical vibration clearly perceptible to humans.
0.32	0.01	Vertical vibration just perceptible to humans.

Source: 'State-of-the-Art Review: Prediction and Control of Groundborne Noise and Vibration from Rail Transit Trains'; U.S. Department of Transportation; December 1983.



MAXIMUM VIBRATION INTENSITIES EXPECTED FROM PILE DRIVING

FIGURE 16

smaller ratings are anticipated to be used on the job site, the initial vibration predictions indicate that there is some risk of exceeding the 0.20 inches/second vibration damage criteria at 33 to 71 feet separation distances, and monitoring during pile driving operations is warranted if pile driving are planned at those distances from any existing structures.

The following preventive measures are recommended for implementation during the planning and design phases of the project:

- In addition to the normal planning and design concerns regarding potential damage due to settling and heaving during construction, consideration should also be given to risks of damage due to vibration from pile driving. A damage criteria of 0.2 inches/second should be used in conjunction with the vibration prediction method of Reference 35 to identify the potential damage risk distances to the driven piles.

- If predicted vibration levels from pile driving exceed 0.2 inches/second at a building, and predicted levels cannot be reduced by sizing of the pile driver, test piles should be driven and their vibrations monitored and recorded prior to completion of the foundation design. The monitoring of the test piles should be designed to measure the expected peak, 3-axis vibration levels at the building. The results of the monitoring should be used to define the empirical distance from the driven pile to the 0.2 inches/second damage risk location, and to evaluate the risks of structural damage to the adjacent structure during actual construction.

- If predicted vibration levels from pile driving exceed 2.0 inches/second at a building, the use of alternate types of piles or shoring should be considered for implementation during the design phase.

APPENDIX A. REFERENCES

(1) "Guidelines for Considering Noise in Land Use Planning and Control;" Federal Interagency Committee on Urban Noise; June 1980.

(2) "Environmental Criteria and Standards, Noise Abatement and Control, 24 FR, Part 51, Subpart B;" U.S. Department of Housing and Urban Development; July 12, l979.

(3) "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety;" Environmental Protection Agency (EPA 550/9-74-004); March 1974.

(4) "Title 11, Administrative Rules, Chapter 46, Community Noise Control;" Hawaii State Department of Health; September 23, 1996.

(5) "FHWA Traffic Noise Model User's Guide;" FHWA-PD-96-009, Federal Highway Administration; Washington, D.C.; January 1998 and Version 2.5 Upgrade (April 14, 2004).

(6) Existing and Future Traffic Turning Movements; Kaka`ako Transit-Oriented Development Plan; Nelson\Nygaard Consulting Associates; October 18 and 22, 2013.

(7) 24-Hour Traffic Counts At Station B72009200638, Ala Moana Boulevard At Bishop Street; Hawaii State Department of Transportation, Highways Division; May 23, 2011.

(8) 24-Hour Traffic Counts At Station B72009200638, Ala Moana Boulevard At Bishop Street; Hawaii State Department of Transportation, Highways Division; May 24, 2011.

(9) 24-Hour Traffic Counts At Station B72009200739, Ala Moana Boulevard East of Ward Avenue; Hawaii State Department of Transportation, Highways Division; May 23, 2011.

(10) 24-Hour Traffic Counts At Station B72009200739, Ala Moana Boulevard East of Ward Avenue; Hawaii State Department of Transportation, Highways Division; May 24, 2011.

(11) 24-Hour Traffic Counts At Station B72750300000, Ala Moana Boulevard Between South Street and Ward Avenue; Hawaii State Department of Transportation, Highways Division; February 21, 2012.

(12) 24-Hour Traffic Counts At Station B72750300000, Ala Moana Boulevard Between South Street and Ward Avenue; Hawaii State Department of Transportation, Highways Division; February 22, 2012.

(13) 24-Hour Traffic Counts At Station B72740200220, King Street Between Punchbowl Street and Kapiolani Boulevard; Hawaii State Department of Transportation, Highways Division; January 20, 2011.

(14) 24-Hour Traffic Counts At Station B72740200220, King Street Between Punchbowl Street and Kapiolani Boulevard; Hawaii State Department of Transportation, Highways Division; January 21, 2011.

(15) 24-Hour Traffic Counts At Station B72740200240, King Street Between Victoria Street and Pensacola Street; Hawaii State Department of Transportation, Highways Division; May 11, 2011.

(16) 24-Hour Traffic Counts At Station B72740200240, King Street Between Victoria Street and Pensacola Street; Hawaii State Department of Transportation, Highways Division; May 12, 2011.

(17) 24-Hour Traffic Counts At Station B72751600056, Punchbowl Street Between King Street and Halekauwila Street; Hawaii State Department of Transportation, Highways Division; January 20, 2011.

(18) 24-Hour Traffic Counts At Station B72751600056, Punchbowl Street Between King Street and Halekauwila Street; Hawaii State Department of Transportation, Highways Division; January 21, 2011.

(19) 24-Hour Traffic Counts At Station B72751600079, Punchbowl Street Between Halekauwila Street and Ala Moana Boulevard; Hawaii State Department of Transportation, Highways Division; January 20, 2011.

(20) 24-Hour Traffic Counts At Station B72751600079, Punchbowl Street Between Halekauwila Street and Ala Moana Boulevard; Hawaii State Department of Transportation, Highways Division; January 21, 2011.

(21) 24-Hour Traffic Counts At Station B72751100042, Ward Avenue Between Kapiolani Boulevard and King Street; Hawaii State Department of Transportation, Highways Division; January 29, 2012.

(22) 24-Hour Traffic Counts At Station B72751100042, Ward Avenue Between Kapiolani Boulevard and King Street; Hawaii State Department of Transportation, Highways Division; March 1, 2012.

(23) 24-Hour Traffic Counts At Station B72751100000, Ward Avenue Between Ala Moana Boulevard and Auahi Street; Hawaii State Department of Transportation, Highways Division; January 20, 2011.

(24) 24-Hour Traffic Counts At Station B72751100000, Ward Avenue Between Ala Moana Boulevard and Auahi Street; Hawaii State Department of Transportation, Highways Division; January 21, 2011.

(25) 24-Hour Traffic Counts At Station B72751100007, Ward Avenue Between Auahi Street and Halekauwila Street; Hawaii State Department of Transportation, Highways Division; January 20, 2011.

(26) 24-Hour Traffic Counts At Station B72751100007, Ward Avenue Between Auahi Street and Halekauwila Street; Hawaii State Department of Transportation, Highways Division; January 21, 2011.

(27) 24-Hour Traffic Counts At Station B72751200080, Pensacola Street Between Kamaile Street and Hoolai Street; Hawaii State Department of Transportation, Highways Division; April 6, 2011.

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(29) 24-Hour Traffic Counts At Station B72751300000, Piikoi Street Between Ala Moana Boulevard and Waimanu Street; Hawaii State Department of Transportation, Highways Division; February 10, 2011.

(30) 24-Hour Traffic Counts At Station B72751300000, Piikoi Street Between Ala Moana Boulevard and Waimanu Street; Hawaii State Department of Transportation, Highways Division; February 11, 2011.

(31) 24-Hour Traffic Counts At Station B72751300027, Piikoi Street Between Kapiolani Boulevard and King Street; Hawaii State Department of Transportation, Highways Division; February 10, 2011.

(32) 24-Hour Traffic Counts At Station B72751300027, Piikoi Street Between Kapiolani Boulevard and King Street; Hawaii State Department of Transportation, Highways Division; February 11, 2011.

(33) "Honolulu High-Capacity Transit Rail Corridor Project Draft Environmental

APPENDIX A. REFERENCES (CONTINUED)

Impact Statement / Section 4(f) Evaluation;" U.S. Department of Transportation Federal Transit Administration and City and County of Honolulu Department of Transportation Services; October 29, 2008.

(34) "Noise and Vibration Technical Report, Honolulu High-Capacity Transit Corridor Project;" City and County of Honolulu; October 1, 2008.

(35) Wiss, John F., Janney, Elstner and Assoc.; "Damage of Pile Driving Vibration;" Highway Research Record, Number 155.

(36) Gutowski, T.G.; Wittig, L.E.; and Dym, C.L.; "Some Aspects of the Ground Vibration Problem;" Noise Control Engineering; May-June 1978.

APPENDIX B

EXCERPTS FROM EPA'S ACOUSTIC TERMINOLOGY GUIDE

Descriptor Symbol Usage

The recommended symbols for the commonly used acoustic descriptors based on A-weighting are contained in Table I. As most acoustic criteria and standards used by EPA are derived from the A-weighted sound level, almost all descriptor symbol usage guidance is contained in Table I.

Since acoustic nomenclature includes weighting networks other than "A" and measurements other than pressure, an expansion of Table I was developed (Table II). The group adopted the ANSI descriptor-symbol scheme which is structured into three stages. The first stage indicates that the descriptor is a level (i.e., based upon the logarithm of a ratio), the second stage indicates the type of quantity (power, pressure, or sound exposure), and the third stage indicates the weighting network (A, B, C, D, E.....). If no weighting network is specified, "A" weighting is understood. Exceptions are the A-weighted sound level and the A-weighted peak sound level which require that the "A" be specified. For convenience in those situations in which an A-weighted descriptor is being compared to that of another weighting, the alternative column in Table II permits the inclusion of the "A". For example, a report on blast noise might wish to contrast the LCdn with the LAdn.

Although not included in the tables, it is also recommended that "Lpn" and "LepN" be used as symbols for perceived noise levels and effective perceived noise levels, respectively.

It is recommended that in their initial use within a report, such terms be written in full, rather than abbreviated. An example of preferred usage is as follows:

The A-weighted sound level (LA) was measured before and after the installation of acoustical treatment. The measured LA values were 85 and 75 dB respectively.

Descriptor Nomenclature

With regard to energy averaging over time, the term "average" should be discouraged in favor of the term "equivalent". Hence, Leq, is designated the "equivalent sound level". For Ld, Ln, and Ldn, "equivalent" need not be stated since the concept of day, night, or day-night averaging is by definition understood. Therefore, the designations are "day sound level", "night sound level", and "day-night sound level", respectively.

The peak sound level is the logarithmic ratio of peak sound pressure to a reference pressure and not the maximum root mean square pressure. While the latter is the maximum sound pressure level, it is often incorrectly labelled peak. In that sound level meters have "peak" settings, this distinction is most important.

"Background ambient" should be used in lieu of "background", "ambient", "residual", or "indigenous" to describe the level characteristics of the general background noise due to the contribution of many unidentifiable noise sources near and far.

With regard to units, it is recommended that the unit decibel (abbreviated dB) be used without modification. Hence, DBA, PNdB, and EPNdB are not to be used. Examples of this preferred usage are: the Perceived Noise Level (Lpn was found to be 75 dB. Lpn = 75 dB). This decision was based upon the recommendation of the National Bureau of Standards, and the policies of ANSI and the Acoustical Society of America, all of which disallow any modification of bel except for prefixes indicating its multiples or submultiples (e.g., deci).

Noise Impact

In discussing noise impact, it is recommended that "Level Weighted Population" (LWP) replace "Equivalent Noise Impact" (ENI). The term "Relative Change of Impact" (RCI) shall be used for comparing the relative differences in LWP between two alternatives.

Further, when appropriate, "Noise Impact Index" (NII) and "Population Weighed Loss of Hearing" (PHL) shall be used consistent with CHABA Working Group 69 Report Guidelines for Preparing Environmental Impact Statements (1977).

APPENDIX B (CONTINUED)

TABLE I

A-WEIGHTED RECOMMENDED DESCRIPTOR LIST

TERM	SYMBOL
1. A-Weighted Sound Level	L_A
2. A-Weighted Sound Power Level	L_{WA}
3. Maximum A-Weighted Sound Level	L_{max}
4. Peak A-Weighted Sound Level	L_{Apk}
5. Level Exceeded x% of the Time	L_x
6. Equivalent Sound Level	L_{eq}
7. Equivalent Sound Level over Time (T) (1)	$L_{eq(T)}$
8. Day Sound Level	L_d
9. Night Sound Level	L_n
10. Day-Night Sound Level	L_{dn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$
12. Sound Exposure Level	L_{SE}

(1) Unless otherwise specified, time is in hours (e.g. the hourly equivalent level is $L_{eq(1)}$). Time may be specified in non-quantitative terms (e.g., could be specified a $L_{eq(WASH)}$ to mean the washing cycle noise for a washing machine).

SOURCE: EPA ACOUSTIC TERMINOLOGY GUIDE, BNA 8-14-78,

APPENDIX B (CONTINUED)

TABLE II

RECOMMENDED DESCRIPTOR LIST

TERM	A-WEIGHTING	ALTERNATIVE(1) A-WEIGHTING	OTHER(2) WEIGHTING	UNWEIGHTED
1. Sound (Pressure)(3) Level	L_A	L_{pA}	L_B, L_{pB}	L_p
2. Sound Power Level	L_{WA}		L_{WB}	L_W
3. Max. Sound Level	L_{max}	L_{Amax}	L_{Bmax}	L_{pmax}
4. Peak Sound (Pressure) Level	L_{Apk}		L_{Bpk}	L_{pk}
5. Level Exceeded x% of the Time	L_x	L_{Ax}	L_{Bx}	L_{px}
6. Equivalent Sound Level	L_{eq}	L_{Aeq}	L_{Beq}	L_{peq}
7. Equivalent Sound Level (4) Over Time(T)	$L_{eq(T)}$	$L_{Aeq(T)}$	$L_{Beq(T)}$	$L_{peq(T)}$
8. Day Sound Level	L_d	L_{Ad}	L_{Bd}	L_{pd}
9. Night Sound Level	L_n	L_{An}	L_{Bn}	L_{pn}
10. Day-Night Sound Level	L_{dn}	L_{Adn}	L_{Bdn}	L_{pdn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$	$L_{Adn(Y)}$	$L_{Bdn(Y)}$	$L_{pdn(Y)}$
12. Sound Exposure Level	L_S	L_{SA}	L_{SB}	L_{Sp}
13. Energy Average Value Over (Non-Time Domain) Set of Observations	$L_{eq(e)}$	$L_{Aeq(e)}$	$L_{Beq(e)}$	$L_{peq(e)}$
14. Level Exceeded x% of the Total Set of (Non-Time Domain) Observations	$L_{x(e)}$	$L_{Ax(e)}$	$L_{Bx(e)}$	$L_{px(e)}$
15. Average L_x Value	L_x	L_{Ax}	L_{Bx}	L_{px}

(1) "Alternative" symbols may be used to assure clarity or consistency.

(2) Only B-weighting shown. Applies also to C,D,E,.....weighting.

(3) The term "pressure" is used only for the unweighted level.

(4) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is Leq(1). Time may be specified in non-quantitative terms (e.g., could be specified as Leq(WASH) to mean the washing cycle noise for a washing machine.

APPENDIX C

SUMMARY OF YEAR 2013 AND 2035
TRAFFIC VOLUMES

ROADWAY LANES	**** CY 2013 ***** AM VPH	PM VPH	CY 2035 (BASELINE) AM VPH	PM VPH	CY 2035 (ALT. A) AM VPH	PM VPH
King St. W. of South (EB)	1,550	1,682	1,550	1,813	567	1,894
King St. E. of South (EB)	1,748	2,274	2,598	2,472	1,648	2,526
King St. Between Ward & Pensacola (EB)	2,854	2,647	2,898	3,045	2,880	3,079
Kapiolani Blvd. W. of South (EB)	698	1,043	455	1,025	342	1,056
Kapiolani Blvd. Between South & Ward (EB)	665	1,179	503	1,173	407	1,189
Kapiolani Blvd. Between South & Ward (WB)	1,227	875	2,003	898	2,220	876
Two-Way	1,892	2,054	2,506	2,071	2,627	2,065
Kapiolani Blvd. Between Ward & Kamakee (EB)	668	1,646	658	1,590	644	1,604
Kapiolani Blvd. Between Ward & Kamakee (WB)	1,761	1,017	1,987	1,028	2,069	1,013
Two-Way	2,429	2,663	2,645	2,618	2,712	2,616
Kapiolani Blvd. Between Kamakee & Pensacola (EB)	651	1,783	706	2,399	650	1,911
Kapiolani Blvd. Between Kamakee & Pensacola (WB)	1,902	926	2,059	926	2,081	971
Two-Way	2,553	2,709	2,765	3,325	2,731	2,882
Kapiolani Blvd. Between Pensacola & Piikoi (EB)	737	1,846	849	2,499	970	2,017
Kapiolani Blvd. Between Pensacola & Piikoi (WB)	1,755	794	1,621	474	1,597	870
Two-Way	2,492	2,640	2,469	2,973	2,567	2,887
Queen St. W. of South (EB)	434	782	655	1,012	456	1,059
Queen St. W. of South (WB)	658	573	962	701	1,122	630
Two-Way	1,092	1,355	1,617	1,713	1,578	1,689
Queen St. Between South & Cooke (EB)	317	571	407	868	386	880
Queen St. Between South & Cooke (WB)	604	524	870	663	879	718
Two-Way	921	1,095	1,276	1,531	1,265	1,597
Queen St. Between Cooke & Ward (EB)	231	546	213	590	211	593
Queen St. Between Cooke & Ward (WB)	554	472	643	429	658	418
Two-Way	785	1,018	856	1,018	869	1,011
Queen St. Between Ward & Kamakee (EB)	166	509	220	598	388	631
Queen St. Between Ward & Kamakee (WB)	369	382	469	455	559	463
Two-Way	535	890	689	1,053	946	1,094
Queen St. E. of Kamakee (EB)	187	511	328	514	328	514
Queen St. E. of Kamakee (WB)	438	551	297	551	297	551
Two-Way	625	1,062	625	1,065	625	1,065

APPENDIX C (CONTINUED)

SUMMARY OF YEAR 2013 AND 2035
TRAFFIC VOLUMES

ROADWAY LANES	**** CY 2013 ***** AM VPH	PM VPH	CY 2035 (BASELINE) AM VPH	PM VPH	CY 2035 (ALT. A) AM VPH	PM VPH
Waimanu St. W. of Pensacola (EB)	272	706	610	917	585	833
Waimanu St. W. of Pensacola (WB)	464	490	552	797	569	749
Two-Way	736	1,196	1,162	1,714	1,154	1,582
Waimanu St. Between Pensacola & Piikoi (EB)	628	1,190	1,006	1,102	1,107	1,047
Halekauwila St. W. of South (EB)	521	623	506	541	505	540
Halekauwila St. W. of South (WB)	55	33	56	33	56	34
Two-Way	576	656	562	574	561	574
Halekauwila St. Between South & Cooke (EB)	183	302	190	306	192	316
Halekauwila St. Between South & Cooke (WB)	149	135	152	136	152	147
Two-Way	332	437	342	442	343	462
Halekauwila St. Between Cooke & Ward (EB)	137	307	137	305	150	295
Halekauwila St. Between Cooke & Ward (WB)	226	146	226	169	226	166
Two-Way	363	453	363	474	376	461
Pohukaina St. W. of South (EB)	259	427	290	559	249	564
Pohukaina St. W. of South (WB)	123	72	159	49	174	45
Two-Way	382	499	449	608	423	609
Pohukaina St. Between South & Cooke (EB)	93	252	134	270	191	308
Pohukaina St. Between South & Cooke (WB)	279	176	541	321	370	202
Two-Way	371	428	675	590	560	510
Pohukaina St. E. of Cooke (EB)	119	284	64	257	240	429
Pohukaina St. E. of Cooke (WB)	195	191	605	555	318	348
Two-Way	314	475	669	812	558	777
Auahi St. W. of Ward (EB)	82	112	400	318	355	321
Auahi St. W. of Ward (WB)	208	174	421	492	396	450
Two-Way	290	286	821	810	751	771
Auahi St. Between Ward & Kamakee (EB)	126	391	229	565	314	613
Auahi St. Between Ward & Kamakee (WB)	216	339	392	592	449	614
Two-Way	342	729	621	1,157	762	1,226
Auahi St. E. of Kamakee (EB)	81	287	169	440	260	372
Auahi St. E. of Kamakee (WB)	63	235	239	311	274	406
Two-Way	144	522	408	751	534	778

APPENDIX C (CONTINUED)

SUMMARY OF YEAR 2013 AND 2035
TRAFFIC VOLUMES

ROADWAY LANES	**** CY 2013 ***** AM VPH	PM VPH	CY 2035 (BASELINE) AM VPH	PM VPH	CY 2035 (ALT. A) AM VPH	PM VPH
Nimitz Hwy. Between Fort & Bishop (EB)	583	2,360	922	2,245	1,167	2,179
Nimitz Hwy. Between Fort & Bishop (WB)	3,282	1,250	2,751	1,510	2,431	1,658
Two-Way	3,865	3,610	3,673	3,755	3,598	3,837
Ala Moana Blvd. W. of South (EB)	2,566	2,469	2,364	2,921	2,241	3,309
Ala Moana Blvd. W. of South (WB)	2,003	2,228	2,537	2,254	2,956	2,354
Two-Way	4,569	4,697	4,901	5,175	5,197	5,663
Ala Moana Blvd. Between South & Cooke (EB)	2,067	2,208	1,755	2,444	1,776	2,738
Ala Moana Blvd. Between South & Cooke (WB)	1,996	1,977	2,416	1,939	2,624	2,050
Two-Way	4,062	4,184	4,171	4,383	4,400	4,788
Ala Moana Blvd. Between Cooke & Ward (EB)	1,756	2,139	1,302	2,305	1,412	2,680
Ala Moana Blvd. Between Cooke & Ward (WB)	1,941	1,700	2,443	1,673	2,576	1,851
Two-Way	3,697	3,838	3,744	3,978	3,988	4,531
Ala Moana Blvd. Between Ward & Kamakee (EB)	1,547	2,124	1,366	2,172	1,628	2,756
Ala Moana Blvd. Between Ward & Kamakee (WB)	1,974	1,710	2,273	1,683	2,391	2,182
Two-Way	3,521	3,834	3,639	3,855	4,018	4,938
Ala Moana Blvd. Between Kamakee & Queen (EB)	1,477	2,002	1,312	2,047	1,578	2,539
Ala Moana Blvd. Between Kamakee & Queen (WB)	1,927	1,577	2,071	1,583	2,239	1,940
Two-Way	3,403	3,579	3,383	3,629	3,816	4,479
Ala Moana Blvd. Between Queen & Piikoi (EB)	1,561	2,186	1,325	2,286	1,410	2,307
Ala Moana Blvd. Between Queen & Piikoi (WB)	2,024	1,759	2,252	1,950	2,196	2,014
Two-Way	3,584	3,945	3,577	4,236	3,605	4,321
Ala Moana Blvd. E. of Piikoi (EB)	1,222	2,012	935	1,986	1,103	1,987
Ala Moana Blvd. E. of Piikoi (WB)	2,048	1,702	2,218	1,916	2,150	2,200
Two-Way	3,270	3,714	3,153	3,902	3,253	4,187
Ilalo St. W. of Keawe (EB)	34	130	87	149	53	197
Ilalo St. W. of Keawe (WB)	72	131	90	198	83	202
Two-Way	106	261	177	347	136	399
Ilalo St. Between Keawe & Cooke (EB)	60	156	101	249	144	308
Ilalo St. Between Keawe & Cooke (WB)	110	141	182	207	178	207
Two-Way	170	297	282	456	322	515
Ilalo St. Between Cooke & Ahui (EB)	49	166	193	448	211	453
Ilalo St. Between Cooke & Ahui (WB)	141	144	306	228	296	235
Two-Way	190	310	499	676	506	688

APPENDIX C (CONTINUED)

SUMMARY OF YEAR 2013 AND 2035
TRAFFIC VOLUMES

ROADWAY LANES	**** CY 2013 ***** AM VPH	PM VPH	CY 2035 (BASELINE) AM VPH	PM VPH	CY 2035 (ALT. A) AM VPH	PM VPH
Ilalo St. Between Ahui & Ala Moana (EB)	44	211	86	337	103	343
Ilalo St. Between Ahui & Ala Moana (WB)	205	104	312	178	302	186
Two-Way	249	315	398	515	405	529
Punchbowl St. Between King & Queen (SB)	627	439	918	516	888	523
Punchbowl St. Between Queen & Halekauwila (SB)	749	285	733	333	664	343
Forrest Ave. S. of Ala Moana (NB)	82	161	101	229	94	233
Forrest Ave. S. of Ala Moana (SB)	183	90	298	246	264	294
Two-Way	265	251	399	475	358	527
South St. Between Ala Moana & Pohukaina (NB)	332	366	408	501	383	518
South St. Between Ala Moana & Pohukaina (SB)	112	129	246	239	309	237
Two-Way	443	495	653	740	692	754
South St. Between Pohukaina & Halekauwila (NB)	393	655	490	915	578	856
South St. Between Halekauwila & Queen (NB)	621	1,142	800	1,444	975	1,313
South St. Between Queen & Kapiolani (NB)	702	1,383	848	1,452	922	1,370
South St. Between Kapiolani & King (NB)	1,592	2,028	2,443	2,081	2,989	1,965
Cooke St. S. of Ilalo (NB)	19	62	19	62	19	62
Cooke St. S. of Ilalo (SB)	24	65	24	65	24	65
Two-Way	43	127	43	127	43	127
Cooke St. Between Ilalo & Ala Moana (NB)	39	97	73	231	132	181
Cooke St. Between Ilalo & Ala Moana (SB)	57	66	386	198	336	108
Two-Way	96	163	458	429	468	289
Cooke St. Between Ala Moana & Pohukaina (NB)	159	196	170	241	182	233
Cooke St. Between Ala Moana & Pohukaina (SB)	155	249	189	277	217	275
Two-Way	314	445	359	518	398	507
Cooke St. Between Pohukaina & Halekauwila (NB)	203	362	381	571	438	705
Cooke St. Between Pohukaina & Halekauwila (SB)	309	341	441	416	568	624
Two-Way	511	702	822	987	1,006	1,329
Cooke St. Between Halekauwila & Queen (NB)	235	474	434	936	465	994
Cooke St. Between Halekauwila & Queen (SB)	355	347	483	475	610	618
Two-Way	590	821	917	1,411	1,075	1,612

APPENDIX C (CONTINUED)

SUMMARY OF YEAR 2013 AND 2035
TRAFFIC VOLUMES

ROADWAY LANES	**** CY 2013 ***** AM VPH	PM VPH	CY 2035 (BASELINE) AM VPH	PM VPH	CY 2035 (ALT. A) AM VPH	PM VPH
Cooke St. N. of Queen (NB)	252	510	423	1,084	504	929
Cooke St. N. of Queen (SB)	389	365	764	607	730	700
Two-Way	641	875	1,187	1,691	1,234	1,629
Ward Ave. Between Ala Moana & Auahi (NB)	368	578	484	937	555	1,155
Ward Ave. Between Ala Moana & Auahi (SB)	450	474	920	764	1,095	855
Two-Way	818	1,051	1,404	1,700	1,650	2,010
Ward Ave. Between Auahi & Halekauwila (NB)	329	642	471	874	438	815
Ward Ave. Between Auahi & Halekauwila (SB)	501	649	669	731	731	756
Two-Way	830	1,290	1,140	1,605	1,169	1,571
Ward Ave. Between Halekauwila & Queen (NB)	458	893	722	1,189	702	703
Ward Ave. Between Halekauwila & Queen (SB)	829	725	966	872	972	876
Two-Way	1,287	1,618	1,688	2,061	1,674	1,579
Ward Ave. Between Queen & Kapiolani (NB)	505	932	1,239	1,590	1,462	1,166
Ward Ave. Between Queen & Kapiolani (SB)	1,098	777	1,577	1,379	1,514	1,386
Two-Way	1,602	1,708	2,816	2,968	2,976	2,552
Ward Ave. N. of Kapiolani (NB)	491	706	998	1,329	1,012	1,109
Ward Ave. N. of Kapiolani (SB)	999	995	1,644	1,580	1,186	1,481
Two-Way	1,490	1,701	2,642	2,909	2,198	2,590
Kamakee St. Between Ala Moana & Auahi (NB)	109	213	197	322	297	687
Kamakee St. Between Ala Moana & Auahi (SB)	208	248	455	350	636	790
Two-Way	317	461	651	671	933	1,477
Kamakee St. Between Auahi & Queen (NB)	112	326	190	315	241	409
Kamakee St. Between Auahi & Queen (SB)	340	367	298	394	381	498
Two-Way	451	693	487	709	622	907
Kamakee St. Between Queen & Kapiolani (NB)	124	388	220	431	395	429
Kamakee St. Between Queen & Kapiolani (SB)	303	237	400	226	414	233
Two-Way	426	625	619	657	809	661
Queen St. N. of Ala Moana (NB)	115	244	55	354	52	385
Queen St. N. of Ala Moana (SB)	55	158	181	200	274	146
Two-Way	170	402	236	554	326	531
Pensacola St. N. of Waimanu (SB)	738	1,022	727	1,025	873	967
Pensacola St. Between Waimanu & Kapiolani (SB)	745	982	729	1,734	684	1,248
Pensacola St. N. of Kapiolani (SB)	986	1,119	1,425	2,215	1,466	1,960

APPENDIX C (CONTINUED)

SUMMARY OF YEAR 2013 AND 2035
TRAFFIC VOLUMES

ROADWAY LANES	**** CY 2013 ***** AM VPH	PM VPH	CY 2035 (BASELINE) AM VPH	PM VPH	CY 2035 (ALT. A) AM VPH	PM VPH
Piikoi St. N. of Ala Moana (NB)	694	756	692	819	772	1,080
Piikoi St. N. of Ala Moana (SB)	298	596	304	552	478	707
Two-Way	992	1,352	996	1,371	1,250	1,787
Piikoi St. Between Ala Moana & Waimanu (NB)	675	778	672	842	747	1,098
Piikoi St. Between Ala Moana & Waimanu (SB)	310	632	317	595	487	737
Two-Way	985	1,410	988	1,437	1,233	1,834
Piikoi St. Between Waimanu & Kapiolani (NB)	901	1,487	1,655	1,502	1,841	1,772
Piikoi St. Between Waimanu & Kapiolani (SB)	112	175	292	498	340	242
Two-Way	1,013	1,662	1,947	2,000	2,181	2,014
Piikoi St. N. of Kapiolani (NB)	960	1,463	1,318	1,744	1,396	1,729

Appendix F:
Air Quality Impact Analysis

AIR QUALITY STUDY

FOR THE PROPOSED

KAKA'AKO TRANSIT-ORIENTED DEVELOPMENT OVERLAY PLAN

KAKA'AKO, OAHU, HAWAII

Prepared for:

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1.0 SUMMARY

The Hawaii Community Development Authority is proposing the Kaka'ako Transit-Oriented Development Overlay Plan for the Kaka'ako Community Development District on the island of Oahu. The proposed Plan will overlay (supplement) the existing rules governing development in the Kaka'ako District. The purpose of the proposed Plan is to maximize development by promoting smart growth principles, multi-modal transportation and walkability in the affected area. The proposed Plan extends through the year 2035 and is expected to result in an increase in residential development and a decrease in non-residential space. This study examines the potential short- and long-term air quality impacts that could occur as a result of the implementation of the proposed Plan and suggests mitigation measures to reduce any potential air quality impacts where possible and appropriate.

Both federal and state standards have been established to maintain ambient air quality. At the present time, seven parameters are regulated including: particulate matter, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, carbon monoxide, ozone and lead. Hawaii air quality standards are comparable to the national standards except those for nitrogen dioxide and carbon monoxide which are more stringent than the national standards.

Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. The climate of the Kaka'ako area is very much affected by its leeward and coastal situation. Winds are predominantly trade winds from the east northeast except for occasional periods when kona storms may generate strong winds from the south or when

the trade winds are weak and landbreeze-seabreeze circulations may develop. Wind speeds typically vary between about 5 and 15 miles per hour providing relatively good ventilation much of the time. Temperatures in leeward areas of Oahu are generally very moderate with average daily temperatures ranging from about 70°F to 84°F. The extreme minimum temperature recorded at Honolulu Airport is 54°F, while the extreme maximum temperature is 95°F. This area of Oahu is one of the drier locations in the state with rainfall often highly variable from one year to the next. Monthly rainfall has been measured to vary from as little as a trace to as much as 10 inches. Average annual rainfall amounts to about 24 inches with summer months being the driest.

The present air quality of the project area appears to be reasonably good based on nearby air quality monitoring data. Air quality data from the nearest monitoring stations operated by the Hawaii Department of Health suggest that all national air quality standards are currently being met, although occasional exceedances of the more stringent state standards for carbon monoxide may occur near congested roadway intersections. Episodes of volcanic haze sometimes reduce visibility, but even during these periods, air pollution concentrations generally meet current air quality standards.

If the proposed Plan is given the necessary approvals to proceed, there could be some short- and/or long-term impacts on air quality that may occur either directly or indirectly as a consequence of Plan implementation. Short-term impacts from fugitive dust could occur during the construction of additional residential housing units. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the minor disruption of

traffic, and from workers' vehicles may also affect air quality during periods of construction. State air pollution control regulations require that there be no visible fugitive dust emissions at the property line. Hence, effective dust control measures should be implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering of active work areas, using wind screens, keeping adjacent paved roads clean, and by covering of open-bodied trucks. Other dust control measures to consider include limiting the area that is disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Paving and landscaping of project areas early in the construction schedule will also reduce dust emissions. Exhaust emissions can be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

To assess the potential long-term impact of emissions from motor vehicle traffic operating on roadways in the study area after implementing the Plan through the year 2035, a computerized air quality modeling study was undertaken. The air quality modeling study estimated current worst-case concentrations of carbon monoxide at roadway intersections in the project vicinity and predicted future levels both with and without the proposed Plan. During worst-case conditions, model results indicated that present 1-hour and 8-hour worst-case carbon monoxide concentrations are well within both the state and the national ambient air quality standards. In the year 2035 without the Plan, worst-case carbon monoxide concentrations were predicted to generally decrease (improve) by about 10 to 20 percent. With the Plan in the year 2035, estimated worst-case carbon monoxide concentrations indicated only minimal or no impact compared to the without Plan case. Concentrations would remain well within

standards. Due to the negligible impact the proposed Plan is expected to have, implementing mitigation measures for long-term traffic-related air quality impacts is unnecessary and unwarranted.

2.0 INTRODUCTION

The Hawaii Community Development Authority (HCDA)is proposing the Kaka'ako Transit-Oriented Development (TOD) Overlay Plan within the Kaka'ako Community Development District (KCDD) on the island of Oahu (see Figure 1 for project location). The proposed TOD Plan will serve as an overlay on the existing rules governing development in the district, meaning that the existing rules remain in force and any proposed TOD development will be required to comply with the proposed TOD Plan. The implementation of the TOD Plan is intended to maximize development in the district by promoting the use of smart growth principles, multi-modal transportation and walkability. The proposed TOD Plan includes the 601.6-acre KCDD as well as the nearby 3.4-acre Aloha Tower Special District. The KCDD is bounded by King Street on the north, Piikoi Street and Ala Moana Regional Park on the east, Punchbowl Street and Pier 1 on the west, and the Pacific Ocean on the south. The Aloha Tower Special District is located on the ocean side of Ala Moana Boulevard and is bounded by Richard Street, Bishop Street and Aloha Tower Drive. The proposed TOD Plan would potentially accommodate an additional 14 million square feet of residential development, as compared to future baseline conditions, and it would reduce the amount of non-residential space accommodated by about two million square feet. The planning horizon for the TOD Overlay Plan is 2035.

The purpose of this study is to describe existing air quality in the project area and to assess the potential short- and long-term direct and indirect air quality impacts that could result from implementation of the proposed TOD Overlay Plan. Measures to mitigate project impacts are suggested where possible and appropriate.

3.0 AMBIENT AIR QUALITY STANDARDS

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter 11-59 of the Hawaii Administrative Rules. Table 1 summarizes both the national and the state AAQS that are specified in the cited documents. As indicated in the table, national and state AAQS have been established for particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. The state has also set a standard for hydrogen sulfide. National AAQS are stated in terms of both primary and secondary standards for most of the regulated air pollutants. National primary standards are designed to protect the public health with an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to

protect public health and welfare and to prevent the significant deterioration of air quality".

Each of the regulated air pollutants has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both national and state standards allow a specified number of exceedances each year.

The Hawaii AAQS are in some cases considerably more stringent than the comparable national AAQS. In particular, the Hawaii 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit.

The national AAQS are reviewed periodically, and multiple revisions have occurred over the past 30 years. In general, the national AAQS have become more stringent with the passage of time and as more information and evidence become available concerning the detrimental effects of air pollution. In particular, national AAQS for sulfur dioxide and for nitrogen dioxide have been revised recently to include one-hour averaging periods. This is generally considered a move to make the standards for these air pollutants more stringent. Changes to the Hawaii AAQS over the past several years have tended to follow revisions to

the national AAQS, making several of the Hawaii AAQS the same as the national AAQS.

4.0 REGIONAL AND LOCAL CLIMATOLOGY

Regional and local climatology significantly affects the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawaii is relatively moderate throughout most of the state, significant differences in these parameters may occur from one location to another. Most differences in regional and local climates within the state are caused by the mountainous topography.

Hawaii lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east. On the island of Oahu, the Koolau and Waianae Mountain Ranges are oriented almost perpendicular to the trade winds, which accounts for much of the variation in the local climatology of the island. The site of the proposed project is located in the leeward area of the Koolau Mountains.

Wind frequency data for Honolulu International Airport (HIA), which is located about 10 miles to the east of the project site, are given in Table 2. These data can be expected to be reasonably representative of the project area. Wind frequency for HIA show that the annual prevailing wind direction for this area of Oahu is east northeast. On an annual basis, 34.7 percent of the time the wind is from this direction, and more than 70 percent of the time the wind is in the northeast quadrant. Winds from the south are

infrequent occurring only a few days during the year and mostly in winter in association with kona storms. Wind speeds average about 10 knots (12 mph) and mostly vary between about 5 and 15 knots (6 and 17 mph).

Air pollution emissions from motor vehicles, the formation of photochemical smog and smoke plume rise all depend in part on air temperature. Colder temperatures tend to result in higher emissions of contaminants from automobiles but lower concentrations of photochemical smog and ground-level concentrations of air pollution from elevated plumes. In Hawaii, the annual and daily variations of temperature depend to a large degree on elevation above sea level, distance inland and exposure to the trade winds. Average temperatures at locations near sea level generally are warmer than those at higher elevations. Areas exposed to the trade winds tend to have the least temperature variation, while inland and leeward areas often have the most. Based on more than 25 years of data collected at Honolulu International Airport, average annual daily minimum and maximum temperatures in the project area are about 70°F and 84°F, respectively [1]. The extreme minimum temperature on record at the airport is 54°F, and the extreme maximum is 95°F.

Small scale, random motions in the atmosphere (turbulence) cause air pollutants to be dispersed as a function of distance or time from the point of emission. Turbulence is caused by both mechanical and thermal forces in the atmosphere. It is oftentimes measured and described in terms of Pasquill-Gifford stability class. Stability class 1 is the most turbulent and class 6 the least. Thus, air pollution dissipates the best during stability class 1 conditions and the worst when stability class 6 prevails.

In the project area, stability class 5 is probably the highest stability class that occurs, developing during clear, calm nighttime or early morning hours when temperature inversions form due to radiational cooling. Stability classes 1 through 4 occur during the daytime, depending mainly on the amount of cloud cover and incoming solar radiation and the onset and extent of the sea breeze.

Mixing height is defined as the height above the surface through which relatively vigorous vertical mixing occurs. Low mixing heights can result in high ground-level air pollution concentrations because contaminants emitted from or near the surface can become trapped within the mixing layer. In Hawaii, minimum mixing heights tend to be high because of mechanical mixing caused by the trade winds and because of the temperature moderating effect of the surrounding ocean. Low mixing heights may sometimes occur, however, at inland locations and even at times along coastal areas early in the morning following a clear, cool, windless night. Coastal areas also may experience low mixing levels during sea breeze conditions when cooler ocean air rushes in over warmer land. Mixing heights in Hawaii typically are above 3000 feet (1000 meters).

Rainfall can have a beneficial effect on the air quality of an area in that it helps to suppress fugitive dust emissions, and it also may "washout" gaseous contaminants that are water-soluble. Rainfall in Hawaii is highly variable depending on elevation and on location with respect to the trade wind. The Kaka’ako area is one of the drier areas on Oahu due to its leeward and near sea level location. Average annual rainfall measured at nearby downtown Honolulu amounts to about 24 inches [2]. Most of the

rainfall usually occurs during the winter months. Monthly rainfall may vary from as little as a trace to more than 10 inches.

5.0 PRESENT AIR QUALITY

Present air quality in the project area is mostly affected by air pollutants from motor vehicles due to the urban situation. Table 3 presents an air pollutant emission summary for the island of Oahu for calendar year 1993. These are the most recent data available. The emission rates shown in the table pertain to manmade emissions only, i.e., emissions from natural sources are not included. As suggested in the table, much of the particulate emissions on Oahu originate from area sources, such as the mineral products industry and agriculture. Sulfur oxides are emitted almost exclusively by point sources, such as power plants and refineries. Nitrogen oxides emissions emanate predominantly from industrial point sources, although area sources (mostly motor vehicle traffic) also contribute a significant share. The majority of carbon monoxide emissions occur from area sources (motor vehicle traffic), while hydrocarbons are emitted mainly from point sources. Based on previous emission inventories that have been reported for Oahu, emissions of particulate and nitrogen oxides may have increased during the last several years, while emissions of sulfur oxides, carbon monoxide and hydrocarbons probably have declined.

Natural sources of air pollution emissions that could affect the project area at times but cannot be quantified very accurately include the ocean (sea spray), plants (aero-allergens), wind-blown dust, and perhaps distant volcanoes on the island of

Hawaii. When the persistent trade winds subside, volcanic haze (vog) originating from Kilauea Volcano on Hawaii Island sometimes affects the whole of Oahu. Kilauea Volcano has been erupting continuously for more than 25 years. The vog consists primarily of very fine particulate matter.

The State Department of Health operates a network of air quality monitoring stations at various locations on Oahu. Each station, however, typically does not monitor the full complement of air quality parameters. Table 4 shows annual summaries of air quality measurements that were made nearest to the project area for several of the regulated air pollutants for the period 2007 through 2011. These are the most recent data that are currently available.

During the 2007-2011 period, sulfur dioxide was monitored by the State Department of Health at an air quality station located at nearby downtown Honolulu. Concentrations monitored were consistently low compared to the standards. Annual second-highest 3-hour concentrations (which are most relevant to the air quality standards) ranged from 0.008 to 0.021 parts per million (ppm), while the annual second-highest 24-hour concentrations ranged from 0.002 to 0.005 ppm. Annual average concentrations were only about 0.001 ppm. There were no exceedances of the state/national 3-hour or 24-hour AAQS for sulfur dioxide during the 5-year period. It should be noted that the national AAQS for sulfur dioxide were revised during 2010, and data pertaining to the revised standards were only reported for 2011 (and are not shown in Table 4). Based on the information available, exceedance of the new 1-hour national AAQS for sulfur dioxide within the study area is very unlikely.

Particulate matter less than 2.5 microns in diameter (PM-2.5) is also measured at the downtown Honolulu monitoring station. Annual highest 24-hour PM-2.5 concentrations ranged from 9 to 50 micrograms per cubic meter ($\mu g/m^3$) between 2007 and 2011. The highest values were generally due to either fireworks on New Year's Eve or bad vog days. Only one exceedance of the 24-hour concentration limit was exceeded during this five-year period and that was due to New Year's Eve fireworks. Average annual concentrations ranged from 3.9 to 4.8 $\mu g/m^3$, which were within the state and national AAQS.

Carbon monoxide measurements were obtained at the downtown Honolulu monitoring station. The annual second-highest 1-hour concentrations ranged from 1.1 to 1.8 ppm. The annual second-highest 8-hour concentrations ranged from 0.8 to 1.0 ppm. No exceedances of the state or national 1-hour or 8-hour AAQS were reported.

Nitrogen dioxide is monitored by the Department of Health at the Kapolei monitoring station, which is about 16 miles west of the project area. Annual average concentrations of this pollutant ranged from 0.003 to 0.005 ppm, safely inside the state and national AAQS. A new 1-hour standard for nitrogen dioxide was implemented during 2010. Data pertaining to this new standard are not shown in Table 4. Based on the information available, exceedance of the new 1-hour standard for nitrogen dioxide within the study area is very unlikely.

The nearest available ozone measurements were obtained at Sand Island (just west of the project area). The annual fourth-highest 8-hour concentrations (which are most relevant to the standards) for the period 2007 through 2011 ranged between 0.033 and 0.048 ppm, which is well inside the state and federal standards. The 8-hour standard for ozone did not exist prior to 2002. Prior to 2002, the now obsolete state 1-hour standard was typically exceeded several times each year.

Although not shown in the table, the nearest and most recent measurements of ambient lead concentrations that have been reported were made at the downtown Honolulu monitoring station between 1996 and 1997. Average quarterly concentrations were near or below the detection limit, and no exceedances of the state AAQS were recorded. Monitoring for this parameter was discontinued during 1997.

Based on the data and discussion presented above, it appears likely that the State of Hawaii AAQS for sulfur dioxide, nitrogen dioxide, particulate matter, ozone and lead are currently being met in the project area. While carbon monoxide measurements at the downtown Honolulu monitoring station suggest that concentrations are within the state and national standards, local "hot spots" may exist near traffic-congested intersections. The potential for this within the project area is examined later in this report.

6.0 SHORT-TERM IMPACTS OF PROJECT

Implementation of the Kaka'ako TOD Overlay Plan would likely result in the construction of up to 14 million square feet of additional residential space compared to without the Plan. Short-term direct and indirect impacts on air quality could potentially occur due to this construction. For development of this nature, there are two potential types of air pollution emissions that could directly result in short-term air quality impacts during construction: (1) fugitive dust from vehicle movement, soil excavation and demolition activities; and (2) exhaust emissions from on-site construction equipment. Indirectly, there also could be short-term impacts from slow-moving construction equipment traveling to and from the project site, from a temporary increase in local traffic caused by commuting construction workers, and from the disruption of normal traffic flow caused by roadway lane closures.

Fugitive dust emissions may arise from the grading and dirt-moving activities associated with site clearing and preparation work. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately. This is because of its elusive nature of emission and because the potential for its generation varies greatly depending upon the type of soil at the construction site, the amount and type of dirt-disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed. The EPA [3] has provided a rough estimate for uncontrolled fugitive dust emissions from construction activity of 1.2 tons per acre per month under conditions of "medium" activity, moderate soil silt content (30%), and precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions at the project site could be somewhere

near that level, depending on the amount of rainfall that occurs. In any case, State of Hawaii Air Pollution Control Regulations [4] prohibit visible emissions of fugitive dust from construction activities at the property line. Thus, an effective dust control plan for the project construction is essential.

Adequate fugitive dust control can usually be accomplished by the establishment of a frequent watering program to keep bare-dirt surfaces in construction areas from becoming significant sources of dust. In dust-prone or dust-sensitive areas, other control measures such as limiting the area that can be disturbed at any given time, applying chemical soil stabilizers, mulching and/or using wind screens may be necessary. Control regulations further stipulate that open-bodied trucks be covered at all times when in motion if they are transporting materials that could be blown away. Haul trucks tracking dirt onto paved streets from unpaved areas is often a significant source of dust in construction areas. Some means to alleviate this problem, such as road cleaning or tire washing, may be appropriate. Paving of parking areas and/or establishment of landscaping as early in the construction schedule as possible can also lower the potential for fugitive dust emissions.

On-site mobile and stationary construction equipment also will emit air pollutants from engine exhausts. The largest of this equipment is usually diesel-powered. Nitrogen oxides emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the annual standard for nitrogen dioxide is not likely to be violated by short-term construction equipment emissions. Also, the new short-term (1-hour) standard for nitrogen dioxide is based on a three-year average; thus it is

unlikely that relatively short-term construction emissions would exceed the standard. Carbon monoxide emissions from diesel engines are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

Project construction activities could obstruct the normal flow of traffic for short periods of times such that overall vehicular emissions in the project area could temporarily increase. The only means to alleviate this problem will be to attempt to keep roadways open during peak traffic hours and to move heavy construction equipment and workers to and from construction areas during periods of low traffic volume. Thus, most potential short-term air quality impacts from project construction can be mitigated.

7.0 LONG-TERM IMPACTS OF PROJECT

Implementation of the Kaka'ako TOD Overlay Plan is expected to result in up to 14 million square feet of additional residential development. This additional residential development could result in added traffic volumes and/or changes in traffic patterns in the project area. This could potentially cause long-term impacts on ambient air quality in the project area. Motor vehicles with gasoline-powered engines are significant sources of carbon monoxide. They also emit nitrogen oxides and other contaminates.

Federal air pollution control regulations require that new motor vehicles be equipped with emission control devices that reduce emissions significantly compared to a few years ago. In 1990, the President signed into law the Clean Air Act Amendments. This

legislation required further emission reductions, which have been phased in since 1994. More recently, additional restrictions were signed into law during the Clinton administration, and these began to take effect during the next decade. The added restrictions on emissions from new motor vehicles will lower average emissions each year as more and more older vehicles leave the state's roadways. It is estimated that carbon monoxide emissions, for example, will go down by an average of about 25 percent per vehicle during the next 20 years due to the replacement of older vehicles with newer models.

To evaluate the potential long-term ambient air quality impact of motor vehicle traffic, computerized emission and atmospheric dispersion models can be used to estimate ambient carbon monoxide concentrations along roadways within the project area. Carbon monoxide is selected for modeling because it is both the most stable and the most abundant of the pollutants generated by motor vehicles. Furthermore, carbon monoxide air pollution is generally considered to be a microscale problem that can be addressed locally to some extent, whereas nitrogen oxides air pollution most often is a regional issue that cannot be addressed by a single project.

For this project, three scenarios were selected for the carbon monoxide modeling study: (1) year 2013 with present conditions, (2) year 2035 without the project, and (3) year 2035 with the project. To begin the modeling study of the three scenarios, critical receptor areas in the vicinity of the project were identified for analysis. Generally speaking, roadway intersections are the primary concern because of traffic congestion and because of the increase in vehicular emissions

associated with traffic queuing. For this study, ten of the key intersections identified in the project traffic study [5] were also selected for air quality analysis. These included the following intersections:

- Kapiolani Boulevard at South Street
- Kapiolani Boulevard at Ward Avenue
- Kapiolani Boulevard at Pensacola Street
- Kapiolani Boulevard at Piikoi Street
- Ala Moana Boulevard at South Street
- Ala Moana Boulevard at Cooke Street
- Ala Moana Boulevard at Ward Avenue
- Ala Moana Boulevard at Piikoi Street
- Queen Street at Ward Avenue
- Bishop Street at King Street.

The above intersections are locations with generally higher traffic volumes and/or lower level-of-service conditions that were included in the project traffic study and are likely locations within or nearby the project area where carbon monoxide concentrations are or will be higher. The traffic impact report for the project describes the existing and projected future traffic conditions and laneage configurations of the study intersections in detail. In performing the air quality impact analysis, it was assumed that all recommended traffic mitigation measures would be implemented.

The main objective of the modeling study was to estimate maximum 1-hour average carbon monoxide concentrations for each of the three scenarios studied. To evaluate the significance of the

estimated concentrations, a comparison of the predicted values for each scenario can be made. Comparison of the estimated values to the national and state AAQS was also used to provide another measure of significance.

Maximum carbon monoxide concentrations typically coincide with peak traffic periods. The traffic impact assessment report evaluated morning and afternoon peak traffic periods. These same periods were evaluated in the air quality impact assessment.

Vehicular carbon monoxide emissions for each year studied were calculated using EPA’s Motor Vehicle Emission Simulator (MOVES) computer model [6]. One of the key inputs to MOVES is vehicle mix. Unless very detailed information is available, national average values are typically assumed, which is what was used for the present study. Ambient temperatures of 59 and 68 degrees F were used for morning and afternoon peak-hour emission computations, respectively, although MOVES emission estimates are not highly sensitive to ambient temperature within the relatively small range that occurs in Hawaii.

After computing vehicular carbon monoxide emissions through the use of MOVES, these data were then input to an atmospheric dispersion model. EPA air quality modeling guidelines [7] currently recommend that the computer model CAL3QHC [8] be used to assess carbon monoxide concentrations at roadway intersections, or in areas where its use has previously been established, CALINE4 [9] may be used. Until a few years ago, CALINE4 was used extensively in Hawaii to assess air quality impacts at roadway intersections. In December 1997, the

California Department of Transportation recommended that the intersection mode of CALINE4 no longer be used because it was thought the model had become outdated. Studies have shown that CALINE4 may tend to over-predict maximum concentrations in some situations. Therefore, CAL3QHC was used for the subject analysis.

CAL3QHC was developed for the U.S. EPA to simulate vehicular movement, vehicle queuing and atmospheric dispersion of vehicular emissions near roadway intersections. It is designed to predict 1-hour average pollutant concentrations near roadway intersections based on input traffic and emission data, roadway/receptor geometry and meteorological conditions.

Input peak-hour traffic data were obtained from the traffic study cited previously. This included vehicle approach volumes, saturation capacity estimates, intersection laneage and signal timings. All emission factors that were input to CAL3QHC for free-flow traffic on roadways were obtained from MOVES based on assumed free-flow vehicle speeds corresponding to the posted or design speed limits.

Model roadways were set up to reflect roadway geometry, physical dimensions and operating characteristics. Concentrations predicted by air quality models generally are not considered valid within the roadway-mixing zone. The roadway-mixing zone is usually taken to include 3 meters on either side of the traveled portion of the roadway and the turbulent area within 10 meters of a cross street. Model receptor sites were thus located at the edges of the mixing zones near all intersections that were studied

for all three scenarios. This acknowledges that pedestrian sidewalks already exist in these locations. All receptor heights were placed at 1.8 meters above ground to simulate levels within the normal human breathing zone.

Input meteorological conditions for this study were defined to provide "worst-case" results. One of the key meteorological inputs is atmospheric stability category. For these analyses, atmospheric stability category 5 was assumed for the morning cases, while atmospheric stability category 4 was assumed for the afternoon cases. These are the most conservative stability categories that are generally used for estimating worst-case pollutant dispersion within urban areas for these periods. A surface roughness length of 100 cm and a mixing height of 1000 meters were used in all cases. Worst-case wind conditions were defined as a wind speed of 1 meter per second with a wind direction resulting in the highest predicted concentration. Concentration estimates were calculated at wind directions of every 5 degrees.

Existing background concentrations of carbon monoxide in the project vicinity are believed to be at relatively low levels. Thus, background contributions of carbon monoxide from sources or roadways not directly considered in the analysis were accounted for by adding a background concentration of 1.0 ppm to all predicted concentrations for 2013. Although increased traffic is expected to occur within the project area within the next several years with or without the project, background carbon monoxide concentrations may not change significantly since individual emissions from motor vehicles are forecast to decrease with time.

Hence, a background value of 1.0 ppm was assumed to persist for the future scenarios studied.

Predicted Worst-Case 1-Hour Concentrations

Table 5 summarizes the final results of the modeling study in the form of the estimated worst-case 1-hour morning and afternoon ambient carbon monoxide concentrations. These results can be compared directly to the state and the national AAQS. Estimated worst-case carbon monoxide concentrations are presented in the table for three scenarios: year 2013 with existing traffic, year 2035 without the project and year 2035 with the project. The locations of these estimated worst-case 1-hour concentrations all occurred at or very near the indicated intersections.

As indicated in the table, the highest estimated 1-hour concentration within the project vicinity for the present (2013) case was 2.6 ppm. This was projected to occur during the morning peak traffic hour near the intersection of Ala Moana Boulevard at Ward Avenue. Concentrations at other locations and times studied were 2.5 ppm or lower. Predicted worst-case 1-hour concentrations at all locations studied for the 2013 scenario were well within both the national AAQS of 35 ppm and the state standard of 9 ppm.

In the year 2035 without the proposed project, the highest worst-case 1-hour concentration was predicted to occur during the morning at two locations. These were the intersections of Ala Moana Boulevard at Cooke Street and Kapiolani Boulevard at Ward Avenue. A value of 2.1 ppm was predicted to occur at these locations and time. Peak-hour worst-case values at the other

locations and times studied for the 2035 without project scenario ranged between 1.6 and 2.0 ppm. Compared to the existing case, predicted concentrations for the year 2035 without the project decreased by about 10 to 20 percent at most locations and worst-case concentrations remained well within the state and national standards.

Predicted 1-hour worst-case concentrations for the 2035 with project scenario did not change significantly at the study intersections compared to without the project in 2035. The maximum concentration was predicted to occur during the morning at the intersection of Ala Moana Boulevard at Ward Avenue, increasing slightly compared to the without project scenario to a concentration of 2.2 ppm. Other concentrations ranged between 1.6 and 2.1 ppm. Worst-case concentrations at all locations studied remained well within the state and federal standards.

Predicted Worst-Case 8-Hour Concentrations

Worst-case 8-hour carbon monoxide concentrations were estimated by multiplying the worst-case 1-hour values by a persistence factor of 0.6. This accounts for two factors: (1) traffic volumes averaged over eight hours are lower than peak 1-hour values, and (2) meteorological conditions are more variable (and hence more favorable for dispersion) over an 8-hour period than they are for a single hour. Based on monitoring data, 1-hour to 8-hour persistence factors for most locations generally vary from 0.4 to 0.8 with 0.6 being the most typical. One study based on modeling [10] concluded that 1-hour to 8-hour persistence factors could typically be expected to range from 0.4 to 0.5. EPA guidelines [11] recommend using a value of 0.7 unless a locally derived

persistence factor is available. Recent monitoring data for locations on Oahu reported by the Department of Health [12] suggest that this factor may range between about 0.2 and 0.6 depending on location and traffic variability. Considering the location of the project and the traffic pattern for the area, a 1-hour to 8-hour persistence factor of 0.6 will likely yield reasonable estimates of worst-case 8-hour concentrations.

The resulting estimated worst-case 8-hour concentrations are indicated in Table 6. For the 2013 scenario, the estimated worst-case 8-hour carbon monoxide concentrations for the ten locations studied ranged from 1.1 to 1.6 ppm, with the highest concentration occurring at the intersection of Ala Moana Boulevard and Ward Avenue. The estimated worst-case concentrations for the existing case were well within both the state standard of 4.4 ppm and the national limit of 9 ppm.

For the year 2035 without project scenario, worst-case concentrations ranged between 1.0 and 1.3 ppm, with the highest concentration occurring at the intersections of Ala Moana Boulevard at Cooke Street and Kapiolani Boulevard at Ward Avenue. All predicted concentrations were within the standards.

For the 2035 with project scenario, worst-case concentrations remained nearly unchanged compared to the without project case, indicating minimal project impact. All predicted 8-hour concentrations for this scenario were well within both the national and the state AAQS.

Conservativeness of Estimates

The results of this study reflect several assumptions that were made concerning both traffic movement and worst-case meteorological conditions. One such assumption concerning worst-case meteorological conditions is that a wind speed of 1 meter per second with a steady direction for 1 hour will occur. A steady wind of 1 meter per second blowing from a single direction for an hour is extremely unlikely and may occur only once a year or less. With wind speeds of 2 meters per second, for example, computed carbon monoxide concentrations would be only about half the values given above. The 8-hour estimates are also conservative in that it is unlikely that anyone would occupy the assumed receptor sites (within 3 m of the roadways) for a period of 8 hours.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The major potential short-term air quality impact of implementing the proposed Kaka’ako TOD Overlay Plan could occur from the emission of fugitive dust during the construction of additional residential units. Uncontrolled fugitive dust emissions from construction activities could amount to about 1.2 tons per acre per month, depending on rainfall. To control dust, active work areas and any temporary unpaved work roads should be watered at least twice daily on days without rainfall. Use of wind screens and/or limiting the area that is disturbed at any given time will also help to contain fugitive dust emissions. Wind erosion of inactive areas of the site that have been disturbed could be controlled by mulching or by the use of chemical soil stabilizers. Dirt-hauling trucks should be covered when traveling on roadways to prevent windage. A routine road cleaning and/or tire washing program will also help to reduce fugitive dust emissions that may

occur as a result of trucks tracking dirt onto paved roadways in the project area. Establishment of landscaping early in the construction schedule will also help to control dust.

During construction phases, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks traveling to and from the project. Increased vehicular emissions due to disruption of traffic by construction equipment and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours.

Implementing the proposed Kaka'ako TOD Overlay Plan could result in changes in motor vehicle traffic patterns or volumes within the study area. Analysis of existing and projected future motor vehicle traffic with and without the proposed Plan indicates that any long-term impacts on air quality in the project area due to emissions from project-related motor vehicle traffic should be insignificant. Worst-case concentrations of carbon monoxide should remain within both the state and the national ambient air quality standards through the year 2035 with or without the proposed Plan. Implementing any air quality mitigation measures for long-term traffic-related impacts is unnecessary and unwarranted.

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Figure 1 - Project Location

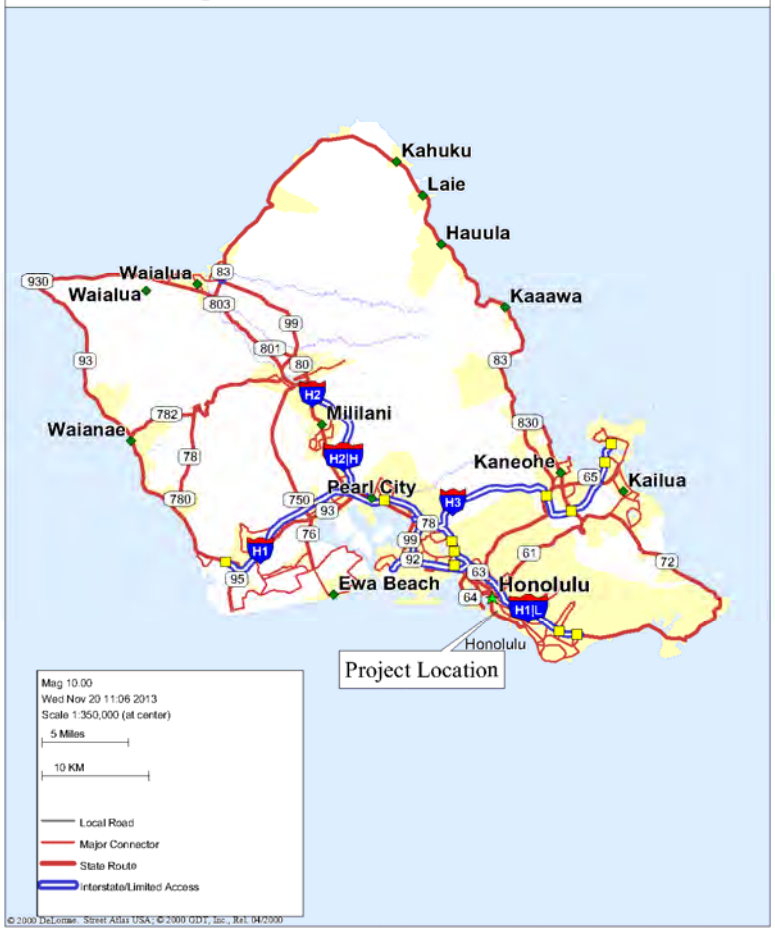

Table 1

SUMMARY OF STATE OF HAWAII AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Particulate Matter (<10 microns)	$\mu g/m^3$	Annual	-	-	50
		24 Hours	150[a]	150[a]	150[b]
Particulate Matter (<2.5 microns)	$\mu g/m^3$	Annual	15[c]	15[c]	-
		24 Hours	35[d]	35[d]	-
Sulfur Dioxide	ppm	Annual	-	-	0.03
		24 Hours	-	-	0.14[b]
		3 Hours	-	0.5[b]	0.5[b]
		1 Hour	0.075[e]	-	-
Nitrogen Dioxide	ppm	Annual	0.053	0.053	0.04
		1 Hour	0.100[f]	-	-
Carbon Monoxide	ppm	8 Hours	9[b]	-	4.4[b]
		1 Hour	35[b]	-	9[b]
Ozone	ppm	8 Hours	0.075[g]	0.075[g]	0.08[g]
Lead	$\mu g/m^3$	3 Months	0.15[h]	0.15[h]	-
		Quarter	1.5[i]	1.5[i]	1.5[i]
Hydrogen Sulfide	ppm	1 Hour	-	-	0.035[b]

[a] Not to be exceeded more than once per year on average over three years.
[b] Not to be exceeded more than once per year.
[c] Three-year average of the weighted annual arithmetic mean.
[d] 98th percentile value of the 24-hour concentrations averaged over three years.
[e] Three-year average of annual fourth-highest daily 1-hour maximum.
[f] 98th percentile value of the daily 1-hour maximum averaged over three years.
[g] Three-year average of annual fourth-highest daily 8-hour maximum.
[h] Rolling 3-month average.
[i] Quarterly average.

Table 2

ANNUAL WIND FREQUENCY FOR HONOLULU INTERNATIONAL AIRPORT (%)

Wind Direction	Wind Speed (knots)									Total
	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	>40	
N	0.5	2.5	1.3	0.5	0.0	0.0	0.0	0.0	0.0	4.8
NNE	0.3	1.2	1.6	1.5	0.2	0.0	0.0	0.0	0.0	4.7
NE	0.3	2.1	6.1	11.0	3.2	0.3	0.0	0.0	0.0	23.0
ENE	0.2	2.5	10.9	16.6	4.1	0.3	0.0	0.0	0.0	34.7
E	0.1	1.0	2.5	2.8	0.5	0.0	0.0	0.0	0.0	7.0
ESE	0.0	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	1.1
SE	0.0	0.3	0.8	1.0	0.1	0.0	0.0	0.0	0.0	2.2
SSE	0.1	0.4	1.2	0.7	0.1	0.0	0.0	0.0	0.0	2.4
S	0.1	0.5	1.4	0.6	0.1	0.0	0.0	0.0	0.0	2.7
SSW	0.0	0.3	0.8	0.3	0.0	0.0	0.0	0.0	0.0	1.5
SW	0.0	0.2	0.8	0.4	0.0	0.0	0.0	0.0	0.0	1.5
WSW	0.0	0.3	0.5	0.4	0.0	0.0	0.0	0.0	0.0	1.2
W	0.1	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1
WNW	0.2	1.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	2.0
NW	0.4	2.3	0.8	0.1	0.0	0.0	0.0	0.0	0.0	3.8
NNW	0.5	2.3	0.8	0.2	0.0	0.0	0.0	0.0	0.0	3.8
Calm	2.5									2.5
Total	5.4	18.3	30.6	36.5	8.5	0.7	0.0	0.0	0.0	100.0

Source: Climatography of the United States No. 90 (1965-1974), Airport Climatological Summary, Honolulu International Airport, Honolulu, Hawaii, U.S. Department of Commerce, National Climatic Center, Asheville, NC, August 1978.

Table 3

AIR POLLUTION EMISSIONS INVENTORY FOR ISLAND OF OAHU, 1993

Air Pollutant	Point Sources (tons/year)	Area Sources (tons/year)	Total (tons/year)
Particulate	25,891	49,374	75,265
Sulfur Oxides	39,230	nil	39,230
Nitrogen Oxides	92,436	31,141	123,577
Carbon Monoxide	28,757	121,802	150,559
Hydrocarbons	4,160	421	4,581

Source: Final Report, "Review, Revise and Update of the Hawaii Emissions Inventory Systems for the State of Hawaii", prepared for Hawaii Department of Health by J.L. Shoemaker & Associates, Inc., 1996

Table 4

ANNUAL SUMMARIES OF AIR QUALITY MEASUREMENTS FOR MONITORING STATIONS NEAREST KAKA'AKO TOD OVERLAY PLAN

Parameter / Location	2007	2008	2009	2010	2011
Sulfur Dioxide / Downtown Honolulu					
3-Hour Averaging Period:					
No. of Samples	2827	2876	2858	2869	2757
Highest Concentration (ppm)	0.021	0.011	0.023	0.010	0.012
2nd Highest Concentration (ppm)	0.018	0.011	0.021	0.010	0.008
No. of State AAQS Exceedances	0	0	0	0	0
24-Hour Averaging Period:					
No. of Samples	359	363	360	365	354
Highest Concentration (ppm)	0.007	0.004	0.005	0.004	0.005
2nd Highest Concentration (ppm)	0.005	0.004	0.004	0.003	0.002
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration (ppm)	0.001	0.001	0.001	0.001	0.001
Particulate (PM-2.5) / Downtown Honolulu					
24-Hour Averaging Period:					
No. of Samples	115	119	305	361	347
Highest Concentration ($\mu g/m^3$)	9	34	21	50	25
98th % Concentration ($\mu g/m^3$)	8	13	13	12	9
No. of State AAQS Exceedances	0	0	0	1	0
Annual Average Concentration ($\mu g/m^3$)	3.9	4.7	4.8	4.7	4.7
Carbon Monoxide / Downtown Honolulu					
1-Hour Averaging Period:					
No. of Samples	8627	8732	8628	8699	8558
Highest Concentration (ppm)	2.0	2.1	1.6	1.8	1.4
2nd Highest Concentration (ppm)	1.6	1.8	1.6	1.5	1.1
No. of State AAQS Exceedances	0	0	0	0	0
8-Hour Averaging Period:					
No. of Samples	8635	8735	8627	8731	8629
Highest Concentration (ppm)	1.1	1.0	0.9	0.8	0.8
2nd Highest Concentration (ppm)	1.0	1.0	0.9	0.8	0.8
No. of State AAQS Exceedances	0	0	0	0	0
Nitrogen Dioxide / Kapolei					
Annual Average Concentration (ppm)	0.005	0.004	0.004	0.003	0.003
Ozone / Sand Island					
8-Hour Averaging Period:					
No. of Samples	357	305	341	8730	8392
Highest Concentration (ppm)	0.036	0.050	0.049	0.052	0.047
2nd Highest Concentration (ppm)	0.035	0.048	0.048	0.048	0.047
4th Highest Concentration (ppm)	0.033	0.043	0.048	0.047	0.046
No. of State AAQS Exceedances	0	0	0	0	0

Source: State of Hawaii Department of Health, "Annual Summaries, Hawaii Air Quality Data, 2007 - 2011"

Table 5

ESTIMATED WORST-CASE 1-HOUR CARBON MONOXIDE CONCENTRATIONS ALONG ROADWAYS WITHIN KAKA'AKO TRANSIT-ORIENTED DEVELOPMENT OVERLAY PLAN (parts per million)

Roadway Intersection	Year/Scenario					
	2013/Present		2035/Without Project		2035/With Project	
	AM	PM	AM	PM	AM	PM
Kapiolani Boulevard at South Street	2.2	2.2	1.7	1.6	2.0	1.6
Kapiolani Boulevard at Ward Avenue	2.2	2.1	2.1	1.8	2.1	1.7
Kapiolani Boulevard at Pensacola Street	2.1	1.9	1.7	2.0	1.8	1.8
Kapiolani Boulevard at Piikoi Street	2.0	2.1	1.8	1.8	1.8	1.7
Ala Moana Boulevard at South Street	2.5	2.3	2.0	1.9	2.1	2.0
Ala Moana Boulevard at Cooke Street	2.5	2.0	2.1	1.8	2.0	1.9
Ala Moana Boulevard at Ward Avenue	2.6	2.2	2.0	1.8	2.2	2.0
Ala Moana Boulevard at Piikoi Street	2.3	2.1	1.8	1.7	1.8	1.8
Queen Street at Ward Avenue	1.8	1.7	1.7	1.6	1.8	1.6
Bishop Street at King Street	2.2	2.1	1.6	1.8	1.6	1.6

Hawaii State AAQS: 9
National AAQS: 35

Table 6

ESTIMATED WORST-CASE 8-HOUR CARBON MONOXIDE CONCENTRATIONS ALONG ROADWAYS WITHIN KAKA'AKO TRANSIT-ORIENTED DEVELOPMENT OVERLAY PLAN (parts per million)

Roadway Intersection	Year/Scenario		
	2013/Present	2035/Without Project	2035/With Project
Kapiolani Boulevard at South Street	1.3	1.0	1.2
Kapiolani Boulevard at Ward Avenue	1.3	1.3	1.3
Kapiolani Boulevard at Pensacola Street	1.3	1.2	1.1
Kapiolani Boulevard at Piikoi Street	1.3	1.1	1.1
Ala Moana Boulevard at South Street	1.5	1.2	1.3
Ala Moana Boulevard at Cooke Street	1.5	1.3	1.2
Ala Moana Boulevard at Ward Avenue	1.6	1.2	1.3
Ala Moana Boulevard at Piikoi Street	1.4	1.1	1.1
Queen Street at Ward Avenue	1.1	1.0	1.1
Bishop Street at King Street	1.3	1.1	1.0

Hawaii State AAQS: 4.4
National AAQS: 9

Appendix G:
Socio-Economic Impact Analysis

JOHN M. KNOX & ASSOCIATES, INC.

ECONOMIC IMPACT ASSESSMENT OF PROPOSED KAKA'AKO RULE CHANGES FOR TRANSIT-ORIENTED DEVELOPMENT

October 15, 2014

Prepared for:
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SUMMARY

This economic impact report was prepared by John M. Knox & Associates, Inc. ("JMK Associates") in conjunction with an overall Environmental Impact Statement (EIS) – and is intended to be appended to and summarized within that EIS – on the consequences of revising the Hawai'i Community Development Authority (HCDA) Plans for future development in the Kaka'ako Community Development District (hereafter referred to simply as "Kaka'ako").

The HCDA is contemplating adoption of a new "TOD Overlay Plan" that would augment existing development Rules governing the various parts of Kaka'ako. The TOD Overlay Plan would, among other things, involve (a) increased heights and densities around planned Honolulu Authority for Rapid Transit (HART) rail stations; and (b) potential development of three hotels.

The primary analysis for the Proposed Alternatives considers:

- Population and economic effects that could flow from complete build-out of Kaka'ako under the current Rules, a situation termed the *"**Future Baseline Condition**."*

- Similar effects that could flow from complete build-out under the TOD Overlay Plan, a scenario termed *"**TOD Alternative A**"*, as well as for a slightly more conservative *"**TOD Alternative B**"* (with lower height limits). For planning purposes, all of the proposed scenarios are assumed to build out by 2035, though in reality it could be longer.

The difference between these future alternatives constitutes the "impact" of these Proposed Actions for any particular topic – e.g., for population or for jobs.

Key Concepts and Caveats: The alternatives referenced above represent HCDA *visions* of how it would like to see Kaka'ako develop in the future. These visions may or may not ever be realized, because the vast majority of Kaka'ako is controlled by landowners who will make independent decisions about if and how they will redevelop their lands. Kaka'ako could develop in various ways under either scenario. For purposes of this analysis, the illustrative Future Baseline Condition is primarily based on a projection developed by HCDA when the current Rules were developed and analyzed. The TOD Alternatives A and B are based on assumptions about changed development patterns created by other consultants during this EIS process.

Analysis is done at two levels: (1) *Kaka'ako-specific* population and employment impacts consider only differences within the Kaka'ako boundaries, though much of this comes from simply shifting population or economic activities from other parts of O'ahu into Kaka'ako. (This is another key concept – for the most part, the Proposed Alternatives would simply allow Kaka'ako to "capture" different amounts of residential or commercial activity that would happen anyway somewhere on O'ahu.) (2) *Islandwide*

impacts are actually smaller, because they are limited to proposed components that presumably would not happen at all under the Future Baseline Condition – by convention, these would primarily be (a) the three hotels, plus (b) some increase in part-time residents (i.e., off-island sources of new spending), as well as (c) any public infrastructure/facility development attributable to net islandwide population or housing impacts of the TOD Alternatives.

Kaka'ako-Specific Impacts of the TOD Alternatives: The following table shows Kaka'ako-wide estimates flowing from the illustrative scenarios used for the analysis. The full report contains additional breakdowns by area and population/job subcategories.

Summary of Key Kaka'ako-Specific Results

	Residential Units	Full-Time Residential Population	Average De Facto Population[1]	Total Operational Jobs at Build-Out[2]	*Office Jobs Only*	Cumulative Construction Jobs from Full Build-Out[3]
Future Baseline Condition	21,146	33,466	33,844	51,207	*37,186*	55,838
TOD Alternative B	26,588	42,477	44,465	43,651	*29,474*	69,220
Impact (Difference)	*5,443*	*9,011*	*10,621*	*-7,555*	*-7,712*	*13,382*
TOD Alternative A	28,968	46,181	48,223	45,157	*30,397*	76,196
Impact (Difference)	*7,822*	*12,715*	*14,379*	*-6,050*	*-6,789*	*20,359*

[1] "De Facto" Pop. = Full-Time Residents Minus Those Temporarily Away, Plus Part-Time Residents and (for TOD Alternatives A and B) Hotel Guests

[2] Total Full- and Part-Time Jobs, All Shifts and Days of Week

[3] In Job-Years (both full- and part-time); includes some "soft-cost" (architect-engineer) jobs; includes construction of additional public infrastructure and government facilities attributable for each scenario

Assuming full build-out, each of the TOD Alternatives generates more population, fewer operational jobs, but more cumulative construction employment in Kaka'ako than does the Future Baseline Condition. Office jobs are broken out above to show they would constitute the majority of operational jobs under either scenario. It is particularly uncertain whether the O'ahu economy would generate demand for so many Office jobs by the assumed 2035 planning horizon.

While all public services and facilities will be impacted by population growth throughout urban Honolulu, responses from affected agencies suggest that impacts of both TOD Alternatives A and B on Kaka'ako-area schools and recreational facilities could be significant. (Park/recreational impacts are considered an "Unresolved Issue" until HCDA completes a study of needs and master plan for the area.) An additional fire station is likely also needed under both Alternative A and Alternative B.

Statewide/Islandwide Impacts of the TOD Alternatives: Most results calculated for this study are technically statewide, but the overwhelming majority would be on O'ahu. For both TOD Alternatives, islandwide impacts flow from an assumed three new hotels, as well as from an estimated increase in average daily population of part-time residents (694 for Alternative A, 356 for Alternative B), as well as construction of additional public infrastructure/facilities required. For simplicity, only "impact" numbers are shown below for each of the Alternatives.

Summary of Key Islandwide Impacts Under TOD Alternative B

Cumulative Construction Effects	Impacts	Average Annual Operational Effects	Impacts
Total Economic Activity ($ Millions)[1]	$496	Total Economic Activity ($ Millions)[1]	$324
Total Household Earnings ($ Millions)	$150	Total Household Earnings ($ Millions)	$94
Total Jobs (Worker-Years) Supported[2]	2,660	Total Jobs (Full-/Part-Time) Supported[2]	2,497
Associated Resident Pop. Supported[2]	4,934	Associated Resident Pop. Supported[2]	4,934
		Avg. Daily Visitor Population Increase[3]	2,106

[1] "Totals" in this table include direct + indirect/induced "ripple effects" statewide (with vast majority on O'ahu)

[2] "Supported" jobs and associated resident population could be either new or existing but maintained by project

[3] Sum of 1,752 hotel guests and 354 increase in part-time residents -- this number is also Kaka'ako-specific

Summary of Key Islandwide Impacts Under TOD Alternative A

Cumulative Construction Effects	Impacts	Average Annual Operational Effects	Impacts
Total Economic Activity ($ Millions)[1]	$474	Total Economic Activity ($ Millions)[1]	$351
Total Household Earnings ($ Millions)	$144	Total Household Earnings ($ Millions)	$101
Total Jobs (Worker-Years) Supported[2]	2,680	Total Jobs (Full-/Part-Time) Supported[2]	2,709
Associated Resident Pop. Supported[2]	5,009	Associated Resident Pop. Supported[2]	5,354
		Avg. Daily Visitor Population Increase[3]	2,364

[1] "Totals" in this table include direct + indirect/induced "ripple effects" statewide (with vast majority on O'ahu)

[2] "Supported" jobs and associated resident population could be either new or existing but maintained by project

[3] Sum of 1,671 hotel guests and 693 increase in part-time residents -- this number is also Kaka'ako-specific

Analysis of government costs and revenues is complicated by various uncertainties (such as whether public funds will be needed for parks, or whether new impact fees or other mechanisms to capture revenue from developers/consumers will be developed). However, the illustrative analysis for this report suggests the State will see a significant annual positive balance from operational elements of each TOD Alternative, A and B. Given some conservative assumptions, the State's balance from construction alone could be negative, but the positive operational balance and build-out would be enough to offset this loss in a single year.

The City and County situation is more neutral – figures mostly hovering a little above zero for both construction and operations, though a little negative for operations under TOD Alternative A only. That apparent negative balance is very small, and would be turned to a small positive balance if the State decides to restore more Transient Accommodations Tax funds to counties in the future.

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1. INTRODUCTION

This introductory chapter is intended to:

1. Explain the purpose of the overall report;
2. Note some unique study aspects and caveats;
3. Describe the study area for the project; and
4. Explain the alternatives and logic of impact assessment in this report.

1.1 Purpose and General Project Description

This economic impact report was prepared in conjunction with an overall Environmental Impact Statement (EIS) – and is intended to be appended to and summarized within that EIS – on the consequences of revising the Hawai'i Community Development Authority (HCDA) Plans for future development in the Kaka'ako Community Development District (hereafter referred to simply as "Kaka'ako"). The current Plans (each with associated administrative Rules)[1] governing Kaka'ako are in several parts:

1. The October 2005 *Makai Area Plan* governs the part of Kaka'ako between Ala Moana Blvd. and the ocean – it has been supplemented by an April 2011 *Kaka'ako Makai Conceptual Master Plan*.
2. The September 2011 *Mauka Area Plan* governs the part above Ala Moana Blvd., the greater portion of Kaka'ako, and the only one with current or planned residential population living in developed structures.

The current EIS addresses consequences of modifying these plans by official adoption of either (1) the Draft Transit Oriented Development Plan and Rules Overlay ("TOD Overlay Plan"),[2] which became the basis for the "TOD Alternative A" discussed in the following Section 1.4, or else (2) a lower-density version of the same Plan, which became the basis for the "TOD Alternative B" described in the same section. Another possible outcome is (3) HCDA rejection of both Alternatives in favor of retaining the current Rules, i.e., the "Future Baseline Condition" discussed in Section 1.4.

The TOD Overlay Plan contains many elements intended to improve the quality of life in Kaka'ako – particularly those related to "Complete Streets" design elements promoting more pedestrian and bicycling use, which in turn would help ensure a more vibrant mixed-used retail and commercial area. However, for purposes of this analysis, the most critical elements would involve ***(a) increased heights and densities around planned Honolulu Authority for Rapid Transit (HART) rail stations; and (b) potential development of three hotels***. These elements apply to both TOD Alternative A and also to Alternative B, albeit with somewhat lower heights and densities in certain

[1] All the indicated Plans and associated Rules are available on the HCDA website at: http://dbedt.hawaii.gov/hcda/plans-rules/
[2] Lee Sichter LLC, Nelson\Nygaard, VIA Architecture. May 20, 2013. "Kaka'ako Community Development District TOD Overlay Plan." (Draft). http://dbedt.hawaii.gov/hcda/transit-oriented-development/

Kaka'ako locations for Alternative B. Both Alternatives could result in more population, employment, and associated impacts than development under current Rules. Therefore, this analysis will sometimes use the phrase "TOD Alternatives" to refer to Alternative A and Alternative B jointly, in contrast to the Future Baseline Condition.

Either of the two TOD Alternatives could theoretically also result in the need for additional public infrastructure and/or facilities and services – and to the extent these can be identified, their economic effects also figure into the analysis.

1.2 Unique Study Aspects and Caveats

The great majority of this report is concerned not with specific proposals that developers want to see happen, but with government agency (HCDA) plans (the TOD Alternatives) that represent slightly different agency *visions* of how it would like to see Kaka'ako develop in the future. Such visions may or may not ever be realized, because the vast majority of Kaka'ako is controlled by landowners who will make independent decisions about if and how they will redevelop their lands, within the parameters of the proposed Rules.

Either version of the proposed new Rules could permit certain new activities, such as limited hotel development, but they do not guarantee that any such development ever will actually take place. That will depend on economic feasibility and market realities.

An important example of this caveat involves ***office space development***. Current Rules permit substantial office development, and the HCDA's vision for what that might mean was captured in a dataset generated by HCDA in 2009, laying out a building-by-building vision for a future Kaka'ako developed under the current Rules (see Chapter 2, Section 2.1.1). This included a large amount of office space. The TOD Alternatives would likely generate *less* office space, but still a potentially large amount.

In reality, little in the way of new office development has occurred in Kaka'ako in recent years, and existing office space in Downtown Honolulu has large vacancy rates. Thus, it is very possible that only a small fraction of the potential new Kaka'ako office space envisioned under either current or potential new Rules will actually be developed by the 2035 build-out timeframe assumed for EIS purposes, though it could occur thereafter. This is worth noting, because the potential number of jobs projected for Kaka'ako is quite large – but most of those jobs are associated with office development. However, again, this study analyzes not specific proposed office space by people actually planning to build it, but rather an HCDA vision in which Kaka'ako is developed in this way.

Another unique aspect of this study flows from the HCDA building-by-building datasets (including an "Existing" dataset). This resulted in an ***unusually complex methodology*** – described at length in Chapter 2 – that necessarily involves detailed description of the ways these datasets were used, not just (as is more typical) assumed values of standard multipliers such as household sizes or job ratios for various economic activities.

1.3 Study Area

Kaka'ako includes about 605 acres and consists of three distinct areas – from smallest to largest:

1. The **Aloha Tower Special District** (about 3.4 acres) is a non-contiguous parcel adjacent to HART's proposed downtown station and to the Aloha Tower Marketplace (which is not a part of the HCDA Aloha Tower Special District). Bounded by Richards St., Bishop St., and Aloha Tower Dr., it is the current site of a Hawaiian Electric Co. (HECO) power facility that may eventually be redeveloped.

2. The **Makai Area** (approximately 151.6 acres) is on the ocean (makai) side of Ala Moana Blvd., and is bounded by Ala Moana Regional Park and the property line between Pier 2 and Pier 4 at the Honolulu Harbor shoreline.

3. The **Mauka Area** (about 450 acres) is the area on the mountain (mauka) side of Ala Moana Blvd., and also bounded by Pi'ikoi St., Punchbowl St., and King St. It consists of seven "Neighborhood Zones" – ***Pauahi*** (where much of the property is owned by the Kamehameha Schools), ***Auahi*** (location of most of the lands owned by Kaka'ako's other large landowner, the Howard Hughes Corporation), ***Kapi'olani***, ***Central Kaka'ako***, ***Civic Center***, ***Sheridan***, and the ***Thomas Square District*** (which is actually makai of, and does not contain, the Thomas Square Park).

Figure 1.1: Kaka'ako Community Development District and Sub-Areas

Source: VIA Architecture, Inc.

1.4 Impact Assessment Logic and Scenarios

Logic: For physical environmental impacts, it usually makes sense to assume that future conditions without adoption of either TOD Alternative A or Alternative B would simply involve a continuation of current conditions. But for economic assessment, the future without the new Plan is not what is there now – rather, it would be development under currently approved Rules.

Therefore, an economic "impact" is not change from present conditions, but rather the ***difference between two estimated futures*** – i.e., the difference in population, jobs, etc. between what is estimated to be possible under either one of the TOD Alternatives, versus what is estimated to occur under existing Plans and Rules ("Future Baseline Condition"). The word "Scenario" will be used as a generic term covering future "Alternatives" and "Conditions," as well as an "Existing Scenario" (below).

Scenarios: The logic thus involves four Scenarios, though only three of them are directly used to calculate two different sets of numerical "impacts" –

1. The **Existing Scenario** represents the best estimate of current conditions. It is not directly used for impact calculations, but is important for context and for some topics is necessary to calculate the numbers used for all future scenarios (for example, new building construction cannot be estimated without knowing what is there now).

2. The **Future Baseline Condition** is the term that will be used to describe what is estimated to happen under current Plans and Rules – i.e., without adoption and implementation of the TOD Alternatives described below.

3. **"TOD Alternative A" and "TOD Alternative B"** are terms that will be used to describe what is estimated to happen under some variant of the TOD Overlay Plan.

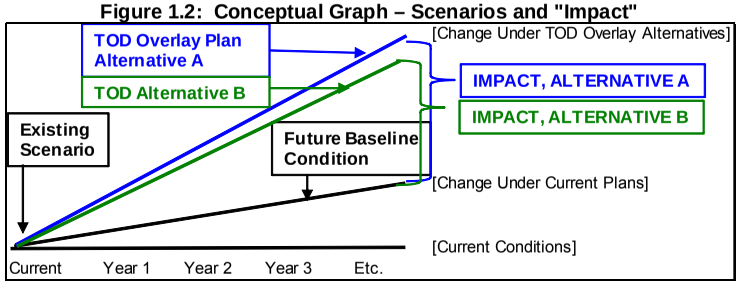
   - **Alternative A** is what is exactly described in the Draft TOD Overlay Plan referenced earlier. It includes the possibility of several 700-foot towers. The economic impact assessment for TOD Alternative A was mostly completed in 2013[3] (except for infrastructure costs needed from other consultant team members, without which the fiscal cost-revenue analysis could not be finished).

   - **Alternative B** is the TOD Overlay Plan variant with lower heights and densities in certain areas. This was developed by other members of the consultant team in response to action by the 2014 Hawaii State Legislature setting forth lower height limits for Kaka'ako in response to concerns about visual impacts. The specifications for Alternative B were developed in August 2014, and those results – along with some small adjustments to Alternative A – were analyzed in August and September of 2014.

[3] Because most of this report was done in 2013, dollar figures are primarily in 2012 dollars, as this was the basis for many figures available at that time. Results for Alternative B were kept in 2012 dollars.

Figure 1.2 shows how these scenarios relate to the concept of economic "impact."

Figure 1.2: Conceptual Graph – Scenarios and "Impact"



Implication of the Term "Scenario" for This Analysis: Many EIS's use the term "scenario," because exact future realities can never be definitively known in advance, and so it is necessary to develop a reasonable set of assumptions about quantitative aspects in order to do calculations. For virtually any EIS, economic "scenarios" mean an imagined but reasonable single version of the many possible outcomes that could describe the points in time being compared. It is therefore a standard rule of economic assessment to create scenarios/alternatives that are "conservative" in the sense of being more likely to err on the side of a larger impact than a smaller impact.

For this analysis, though, the term "scenario" is particularly apt, as it implies a possible but not certain outcome. As previously noted, the Kaka'ako situation differs greatly from situations in many EIS's. Yet another difference is that many EIS's are triggered by proposed actions that have specific characteristics at the time of the proposal but may turn out to be somewhat different. For example, a resort development that seeks overall land use approvals may be initially described as having 500 hotel units and 500 timeshare units, but due to market conditions or other factors is actually later built to have 400 hotel units and 600 timeshares – i.e., the range of realistic outcomes can vary somewhat from the specific EIS scenario.

However, in the case of Kaka'ako, the range of possible future realities is particularly great. The HCDA is a development authority, not a landowner. How landowners will actually respond to opportunities under either the current or proposed Plans/Rules will depend on many factors that simply cannot be known for sure – economic cycles, availability of capital, idiosyncratic personal or geographical factors affecting possible land consolidation, etc.

It would be impossible to conduct a quantitative analysis without making the sorts of assumptions that produce a "scenario." These assumptions are greatly facilitated by HCDA datasets, described further in Chapter 2, that model Kaka'ako structures on a building-by-building, block-by-block basis.

1.5 Other Issues Related to Logic of "Scenarios"

Timeframes Applied to Scenarios:

- The "Existing" scenario will be operationalized as meaning the year 2010. The building-specific, block-specific Kaka'ako datasets described in Chapter 2 were completed in 2009, shortly before the 2010 Census, and little actual new developments were finished in the interim (or, for that matter, the time between 2010 and 2013, though a substantial number of new projects are now underway or are in the planning stages).

- Both the "Future Baseline Condition" and both the "TOD Alternatives" are nominally operationalized as potential situations in the year 2035, though in reality they depict a probable build-out situation (not necessarily maximal *total* development under the respective Plans/Rules, but the maximal *likely* development according to the various HCDA consultants who primarily developed them).

  An important unanswered, and currently unanswerable, question is the actual timing of this build-out. The analysis is conservative, in the sense of assuming maximal likely impacts, by concentrating the full range of potential development into the 2010-2035 time period. The analysis truly considers ***build-out of HCDA visions of Kaka'ako*** whenever they really occur.

Geographical Levels of Analysis within Kaka'ako: Although the methodology for the analysis in this report involves use of building-specific and block-specific assumptions from the previously mentioned datasets, ***results will be presented only on a Kaka'ako-wide basis***, ***and by large areas such as Mauka/Makai and the various Mauka "Neighborhood Zones."***

Both the current Mauka and Makai Plans, as well as the TOD Alternatives, provide landowners with the *opportunity* to redevelop in certain ways, but in no way *obligate* them to do so. Presenting block-specific results could be interpreted as attempting to influence landowner decisions, which would be inappropriate.

It was possible and appropriate to attempt to make reasonable assumptions and forecasts for small areas such as individual city blocks, then add up the individual results to obtain a Kaka'ako-wide outcome. However, many of those small-area results will inevitably be inaccurate. It is a principle of model-building that individual errors tend to cancel out, while still contributing to greater accuracy at the macro-level. An analogy would be life insurance companies predicting their total pay-outs by assessing the risks associated with each customer – the individual predictions may each be off to some degree, but the cumulative actuarial numbers are generally trustworthy.

Another geographical level of analysis is the islandwide one, reserved for certain parts of the study, as per the following discussion.

1.6 Other Issues Related to Logic of "Impacts" – Level of Impact

A final important issue has to do with whether "impacts" are determined as ***Kaka'ako-specific versus statewide/islandwide***.

1.6.1 Kaka'ako-Specific Impacts

A Kaka'ako-specific impact would be one that is confined to Kaka'ako itself (even if that impact is balanced by an accompanying reduction in some other part of the island).

For example, increased residential population growth within Kaka'ako due to higher densities under either of the TOD Alternatives generally means that people already on O'ahu would live in Kaka'ako rather than somewhere else, reducing numbers elsewhere on the island. ***Kaka'ako-specific impacts may in fact just be due to shifts in geographical location*** of economic and population activity that would be happening elsewhere anyway. That is, they may be "impacts" within the Kaka'ako boundaries or any identifiable areas from which they attract population, but from an islandwide perspective their net impacts may be essentially zero.

Kaka'ako-specific impacts are of particular interest to HCDA and Kaka'ako stake-holders, and so will be separately reported, labeled, and given detailed attention. Most of the report will focus on Kaka'ako-specific impacts.

1.6.2 Statewide / Islandwide Impacts

An islandwide impact would involve "net new" economic activity and/or population that either (a) occurs in Kaka'ako but is for some reason not balanced by a reduction elsewhere on the island (hence is a "net" gain); or (b) occurs outside of Kaka'ako as a result (via "ripple effects" from expenditures) of net new economic activity occurring within Kaka'ako.

An example of the latter would be if implementation of a TOD Alternative results in expanding O'ahu's economic base of "export" industries (primarily tourism and visitor expenditures) that bring new money into the state. Due to multiplier or "ripple effects" of outside money coming into the O'ahu economy, there could be additional spending, employment, and population throughout the entire state – however, the vast majority of these statewide effects would occur on O'ahu, so the distinction between "statewide" and "islandwide" effects is very, very small.

Relatively small proportions of planned future development under either the Future Baseline Condition or the TOD Alternatives would generate substantial "new" money, and so ***islandwide impacts will be fairly small*** compared to Kaka'ako-specific ones. Islandwide impacts are nevertheless presented because (a) this is the proper level for assessing impacts on State and County costs and revenues; and (b) it is important to understand that Kaka'ako-specific impacts for the most part are *not*

statewide/islandwide ones – e.g., additional full-time residential population in Kakaʻako does not mean an equal amount of growth in the islandwide population.

1.6.3 Project Components Generating Islandwide Impacts

Most of the Kakaʻako-specific impacts to be described would *not* be islandwide impacts. Just as with full-time residential population, most of the changes in economic activity (e.g., levels of retail, industrial, or office space) from the Future Scenario to either of the TOD Alternatives would simply be a matter of location – they are a function of the larger islandwide economy and market forces, and hence would be located somewhere on the island with or without this project.

However, the following elements *will* be assumed to be net new islandwide impacts –

- **Hotel Construction and Operations:** Both TOD Alternatives (A or B) envision up to three new hotels in Kakaʻako, and the scenarios for analysis assume development of three likely hotel types, as per guidance from HCDA – a business hotel, a condominium-hotel, and a traditional full-service hotel for travelers desiring to stay outside Waikīkī. Operational impacts of hotels flow from new visitor population and visitor spending throughout the state and island, not just in Kakaʻako.

  The actual development, nature, location, and characteristics of any Kakaʻako hotels will in reality be determined by market forces. It could be argued that if there is a market for three more urban Honolulu hotels, they would be developed somewhere on the island with or without this project. However, there is a very longstanding convention in Hawaiʻi EIS's for assuming that, without new entitlements, market forces would be thwarted and the requested new visitor units would not be developed elsewhere on island, at least without separate permits and entitlements subject to study in other EIS's.

- **Additional Levels of, and Spending by, Part-Residents:** Part-time residents are treated as "visitors" in most economic studies because, as with hotel guests, their spending represents new money in the economy and thereby generate new jobs. Census data noted later in this study indicate part-time residents already own units in Kakaʻako, and so their numbers would likely increase under <u>either</u> the Future Baseline Condition <u>or</u> the two TOD Alternatives (A or B). The object of this analysis is to estimate the likely *increment* in their numbers, spending, and associated economic impacts from the Future Baseline Condition to either of the TOD Alternatives.

  For purposes of this analysis, economic benefits associated with *construction* of new units ultimately occupied by this increment in part-time residents will conservatively *not* be counted among the islandwide impacts. No specific new buildings are (or, under existing or proposed Rules, could be) targeted for occupancy by part-time residents alone. If the part-time residential market were for some reason not to materialize after all, the additional residential capacity provided by either of the TOD

Alternatives would still be in place – but actual full build-out would just be somewhat delayed if the market consisted entirely of full-time Honolulu residents. (However, because part-time residents often spend significant sums to prepare new units for occupancy, impacts of such estimated initial one-time expenditures *will* be counted among the construction impacts.)

2. METHODS AND ASSUMPTIONS

The analysis was conducted in stages. Each stage had a distinct analytic approach and a distinct output:

1. **Kaka'ako-Specific Space for Various Building/Land Uses:** This stage involved application of information obtained primarily from or through other project consultants to develop (a) square footage for various specific building/land uses; and (b) the number of units of various types (e.g., full-time residential, part-time residential, and any visitor uses). The square footage output was used by other consultants (most immediately the traffic consultants) and also later for JMK Associates' own employment estimates. Results were computed for the Existing Scenario, the Future Baseline Condition, and both TOD Alternatives (A and B).

2. **Kaka'ako-Specific Population:** This stage also used some inputs from other consultants, along with U.S. Census data, to estimate both (a) full-time residential population, and also (b) "de facto" residential population (actual number of people staying there on an average day, including part-time residents and visitors). Results were generated for Existing, Future Baseline Condition, and both TOD Alternatives. (Note: *Islandwide* population impacts flowing from things like new hotels in Kaka'ako were separately studied as part of the "islandwide associated economic impacts" below.)

3. **Kaka'ako-Specific Operational Employment Impacts:**[4] This stage used land use square footage and/or units for each use, along with appropriate multipliers, to estimate total combined numbers of full- and part-time jobs in Kaka'ako for the Existing Scenario and –following future "build-out" of all proposed elements – for the Future Baseline Condition and for both TOD Alternatives.

4. **Kaka'ako-Specific Construction Employment Impacts:** This stage used assumed construction costs and information from the State of Hawaii Input-Output (I-O) Model to estimate cumulative construction full- and part-time jobs to achieve the visions for the Future Baseline Condition and both TOD Alternatives. Construction logically precedes operational employment, but includes public facility and infrastructure projects predicated in part on projected operational jobcounts. The analysis is discussed prior to "Public Facilities" (below) for the reader's ease, as it is conceptually parallel to the preceding analysis of operational employment impacts.

5. **Public Services and Facilities:** This analysis particularly focused on the Kaka'ako-specific level, though estimates are also made at the islandwide level.

[4] Kaka'ako-specific economic operational and construction impacts focused on employment only – as opposed to other possible economic effects, such as output and earnings – because operational jobs in particular were of primary concern for other consultant team members (traffic and infrastructure analysis).

6. **Statewide/Islandwide Construction-Related Economic Impacts:** This stage looked at construction from the *islandwide* perspective (technically *statewide*, but with the vast majority of impacts occurring on O'ahu – see detailed explanation in Section 2.6.2). It assumed that most construction of new Kaka'ako buildings would happen somewhere in the urban area or elsewhere on the island with or without either TOD Alternative (A or B) – key exceptions being new hotels and any Kaka'ako-specific public infrastructure or facility expenditures. The analysis utilized State I-O multipliers and hotel construction cost estimates.

7. **Estimated On-Site Operational Employment and Statewide/Islandwide Associated Economic Impacts:** By the same logic, this stage was effectively an analysis of the post-construction islandwide operational impacts associated just with the proposed new hotels (as well as spending by increased numbers of part-time residents). It used I-O multipliers and estimated visitor expenditures.

8. **Fiscal Cost-Revenue Impacts:** This stage used output from all the foregoing steps, as well as standard multipliers and some information from other HCDA consultants, to develop estimates of public costs and revenues. State and County governments are concerned with statewide and islandwide impacts, so the analysis is primarily at that level.

2.1 Estimated Space for Various Building/Land Uses

This initial stage (results in Chapter 3) was heavily focused on producing results needed by the project's traffic consultants, Nelson\Nygaard Consulting Associates, Inc. (herein-after "Nelson\ Nygaard"), though it also generated data for further stages of analysis by JMK Associates. As shortly noted, key inputs were spreadsheet datasets generated by HCDA, and so this stage was also completed using spreadsheet methodology.

2.1.1 Data Sources

Overview of Sources: The primary data sources were –

1. HCDA's original Synoptic Survey[5] output (for Mauka blocks, 2010 Existing and 2035 Future Baseline Condition) – further described below;

2. Projections for this study by VIA Architecture, Inc. ("VIA"), the urban design and TOD specialist retained by Lee Sichter LLC, for future land uses for:

   - Specific Kamehameha Schools (KS) and Howard Hughes (HH) blocks expected to be affected by TOD – for both the Future Baseline Condition (based on VIA analysis of KS and HH Master Plans) and both TOD Alternatives (A and B);

[5] In-house HCDA datasets generated in 2009, with final descriptions completed in 2010.

- Other Mauka blocks (non-KS and non-HH) expected to be affected by TOD – for the two TOD Alternatives only (as Future Baseline land uses for these blocks were incorporated in the HCDA numbers);

- Additional VIA modifications to certain HCDA Future Baseline block redevelopment assumptions to reflect (a) Industrial uses not included by HCDA;[6] and (b) needed reductions in other HCDA projected uses (e.g., Retail or Office) to accommodate the Industrial space;

- Makai lands and Aloha Tower Special District Site development – Future Baseline Condition and (for the Aloha Tower Special District Site only) both TOD Alternatives (A and B);

3. HCDA-selected 2013 updates to its original spreadsheet datasets (revised Future Baseline data for a few entitled projects, plus data on *existing* Makai activities);

4. Various further estimates and assumptions generated by JMK Associates.

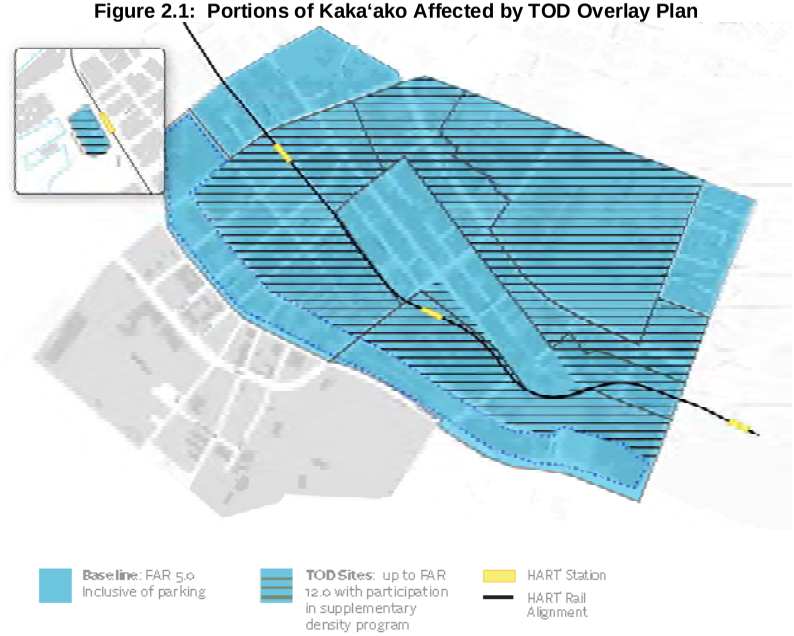
HCDA Spreadsheets: A key foundation of the analysis – for both this stage and following ones – was the in-house set of spreadsheets made available by the HCDA for the "Existing" and "Future Baseline" scenarios. The original 2009 datasets provided a detailed estimate of numbers of units and land use square footages for all buildings (and in fact all *stories* [i.e., floors or levels] of all buildings) in the Mauka portion of Kaka'ako as of 2009, as well as forecasted future build-out under the 2009 Mauka Area rules.

For this analysis, the HCDA Existing and Future Baseline spreadsheet figures were updated for selected portions of Kaka'ako for which more recent information was available – e.g., the KS and HH Master Plans, which VIA used to provide JMK Associates with alternative Future Baseline numbers for certain blocks. Both the current KS and HH Master Plans were developed under the current Mauka Area Rules and therefore are properly considered part of the "Future Baseline." However, the original 2009 HCDA Future Baseline dataset used development assumptions for these blocks that were later modified in the KS and HH Master Plans.

As noted above, JMK Associates also used VIA projections to alter the original HCDA figures for some Future Baseline blocks and for all designated areas whose future development patterns were assumed to be affected by the new TOD-based Rules for either TOD Alternative (see Figure 2.1). For all other areas, the presumed pattern of development under either or both TOD Alternatives was assumed to be identical to the pattern under the Future Baseline Condition.

[6] HCDA's 2009 Synoptic Survey spreadsheets included Industrial uses in its Existing dataset but not in what we here term the Future Baseline one, apparently because the current Mauka Rules no longer break out Industrial as a separate category. However, for purposes of this analysis, it was appropriate to recognize and quantify Industrial uses in the Future Baseline dataset as well.

Figure 2.1: Portions of Kaka'ako Affected by TOD Overlay Plan



Source: Lee Sichter LLC, Nelson\Nygaard, VIA Architecture. May 20, 2013. "Kaka'ako Community Development District TOD Overlay Plan." (Draft). Figure 3-2, p. 3-4.

A critical implication of this approach is that very fine-grained and specific building-by-building assumptions were available for most parts of Kaka'ako, although (a) most of the Future Baseline building assumptions generated by HCDA were hypothetical; and (b) most VIA projections for the Future Baseline Condition and both TOD Alternatives involved more aggregated data – i.e., they were often cumulative block-level figures rather than building-by-building.

This means the numbers truly represent particular illustrative scenarios. These are valuable in terms of generating place-specific estimates – e.g., they can be used to produce arguably better results for the specific Kaka'ako districts or "Neighborhood Zones" used by HCDA for planning purposes. However, in generating quantitative models and estimates of this nature, errors are always likely to be greater at the more site-specific levels, and results are always likely to be more accurate at the larger levels. Therefore, as previously noted in Chapter 1, results are reported only at the levels of (a) Kaka'ako-wide; (b) broad area (Mauka, Makai, Aloha Tower Special District); and (c) Neighborhood Zone.

2.1.2 Land Use Categories

JMK Associates needed to use categories compatible with City definitions for estimating jobs from land uses in the third stage of this analysis. Despite different words used in land use labels by the City, HCDA spreadsheets, and VIA's initial input, the actual working categories were generally found to be consistent, or could be made so:

- Residential
- Hotel (for three properties in the TOD Alternatives only)
- Civic/Public (buildings designed for specific public uses, e.g., fire stations, hospitals)
- Office ("Commercial," usually interpreted as Office)
- Retail
- Industrial
- Surface Parking
- Garage Parking
- Medical/Educational (Nelson\Nygaard requested this category for the John A. Burns School of Medicine, or JABSOM, in the Makai area)
- Community Center (Nelson\Nygaard requested category for Children's Discovery Center).

Except for the last two categories and for "Hotel," HCDA used these categories or close equivalents for the Existing dataset. For the Future Baseline Condition, it used the same categories *except* for "Industrial," which ceased to become a separate land use category under the 2009 Mauka Area Rules. As described shortly (Section 2.1.4), JMK Associates estimated "Industrial" uses for the Future Baseline Condition (and these were carried over to both TOD Alternatives (A and B) where appropriate).

2.1.3 Geographical Areas and Block Numbering System

For purposes of this analysis, individual city blocks may be considered to fall into four main categories, for which land use figures came from predominantly different sources:

1. HCDA Mauka blocks (translated into a consistent numbering system[7] generated by VIA) – these will hereafter be called "VIA blocks" to indicate the blocks were initially identified by HCDA but final numbering came from VIA;

2. Makai block areas, including one for the Aloha Tower Special District Site, that were identified by VIA, corresponding to standard HCDA and City blocks – for purposes of simplification and because of their inclusion in a common numbering system, the general term "VIA blocks" will also be used to refer to these Makai areas, though in fact Makai block information came primarily from HCDA (see Section 2.1.4);

[7] A consistent system was needed because HCDA used one set of numbers for the Existing database and a different set for the same blocks in what is here called the Future Baseline dataset.

3. KS Master Plan blocks, which all equate to VIA blocks, except for one VIA block that had to be *split* because only part of it was located within "Block B" of the KS Master Plan – these are a sub-set of HCDA Mauka blocks for which HCDA Future Baseline numbers were replaced by VIA estimates based on the KS Master Plan;

4. HH Master Plan blocks, which sometimes equate to VIA blocks but sometimes consist of an *aggregation* of those blocks and/or involve *splitting* VIA blocks – these are a sub-set of VIA Mauka blocks for which HCDA Future Baseline numbers were replaced by VIA estimates based on the HH Master Plan.

Because the KS and HH blocks (especially HH "Block 5" from its Master Plan) require these splits, the final geographical output had a few areas that were partial VIA blocks *not* absorbed into HH areas.

Figure 2.2 shows the VIA block numbering system. It also identifies the specific blocks (colored) assumed by VIA to have higher density for both TOD Alternatives – with hatched blocks having lower density under TOD Alternative B than under TOD Alternative A.

TOD-affected blocks include:

- Certain HH and KS blocks; and

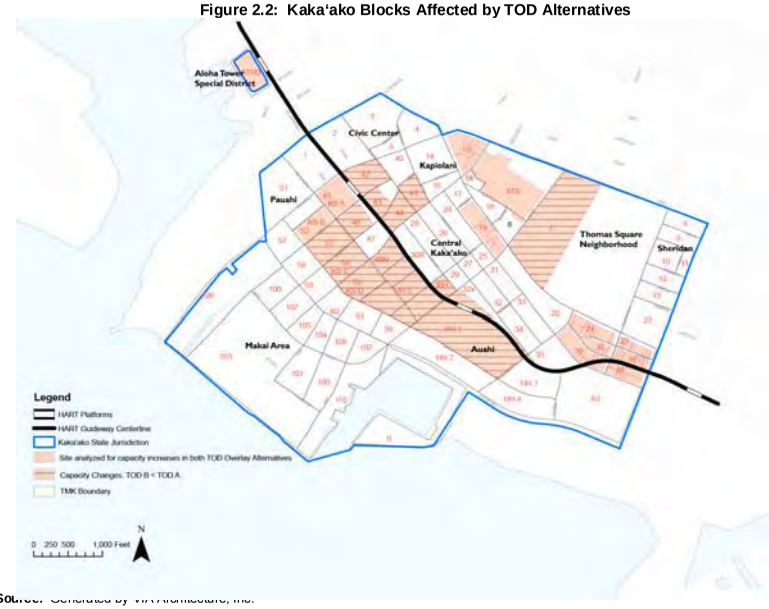
- Blocks with various other owners – which will hereafter be called ***"Other TOD Blocks"*** to indicate non-HH, non-KS blocks assumed by VIA to be differently developed under the TOD Alternatives than under the Future Baseline Condition.

The following Table 2.1 indicates which major landowner blocks are assumed to change from the Future Baseline Condition to either of the TOD Alternatives (A or B). Table 2.2 provides a similar list of the "VIA Blocks" (non-KS and non-HH blocks assumed to change).

Table 2.1: Kamehameha Schools and Howard Hughes Blocks Affected by TOD

VIA Block No.	Source of Square Footage and Unit Assumptions (Future Baseline Condition and Both TOD Alternatives)	KS or HH Master Plan Block No.
45	**Future Baseline Condition:** VIA generated initial square footage assumptions based on landowners' Master Plans, including as appropriate information on projects in Phase 1 planning stages. JMK Associates finalized, and estimated units, based on procedures described in Section 2.1.4. **TOD Alternatives (A and B):** VIA generated estimates of potential additional development within the areas eligible for the TOD Plan, and JMK Associates finalized in same way.	KS Block A
52K (portion of original Block 52 equivalent to KS Block B)		KS Block B
54		KS Block C
55		KS Block D
62		HH Block 1
49, 50, 56 (all parts), part of 30 (called 30H), and part of 48 (48S)		HH Block 5

Figure 2.2: Kaka'ako Blocks Affected by TOD Alternatives



Source: Generated by VIA Architecture, Inc.

Table 2.2: "Other TOD Blocks" Assumed to Be Affected by TOD Development

VIA Block No.	Source of Square Footage and Unit Assumptions (Future Baseline Condition)	Source of Square Footage and Unit Assumptions (TOD Alternatives A and B)
6TS, 15, 19, 21, 36-39, 41, 42, 44, 46, 48N, 53	All of these from the HCDA dataset adapted for "Future Baseline Condition" purposes	Square footage from VIA; units estimated by JMK Associates based on procedures described in Section 2.1.5
7 (B+C)		As above, plus carry-over of McKinley High School information from Future Baseline data
43		As above, plus carry-over of one building from Future Baseline that appeared outside the specified redevelopment area

- The exception was the addition of a project that HCDA apparently missed in the initial "Existing" spreadsheets – Kamakee Vista, which the 2010 Census indicated had 227 units. We assumed each unit was 600 square feet (SF), + 13% for common areas, for an estimated total 153,906 SF.

- In all use of HCDA spreadsheets, we generated building total SF and units by summing individual building story figures from HCDA and then summing buildings to get block totals. Because HCDA had some rounding error in its figures, our building/block totals deviated slightly from their totals (which HCDA separately reported). We carefully compared results to ensure that the deviations were of negligible magnitude. In a very few cases (in the Sheridan area), the unit-count deviations were sufficiently great that we utilized the original HCDA building totals rather than just the sum of the figures for stories.

  (The reason for this procedure was to permit "apples-to-apples" checks of summed figures from one internal spreadsheet page to another.)

Makai Area (including Aloha Tower Special District Site)

- As previously noted, the original HCDA spreadsheets covered only the Mauka parts of Kaka'ako. In 2013, HCDA generated a partial list of major buildings and total SF for each Makai block. JMK Associates supplemented this with visual inspections (on-site and Google Earth) to produce a complete list of buildings, and then conferred with HCDA to generate additional square footage estimates for most or all of the remaining buildings. VIA also contributed to this inventory of existing uses.

- Two sites could <u>not</u> be translated into square footage estimates desired by Nelson\Nygaard for its traffic analysis:

- **Kewalo Basin** had a year 2010 population of 223, according to US Census, but no "residential" SF. (It is unclear where these people were actually living, as living aboard boats is not permitted.) Additionally, SF estimates for scattered government structures were unavailable. However, we informed Nelson\Nygaard of the harbor master's estimates of total jobcount.

- **HECO Power Facility** ("Aloha Tower Special District Site") – We could obtain only footprint SF info, not total SF, due to the odd nature of the building. Again, we informed Nelson\Nygaard of HECO's estimated total jobcount for the site.

2.1.4 Assumptions and Procedures for "Future Baseline Condition"

Mauka Area

- Initial data came from the HCDA dataset assumed to represent the "Future Baseline" – with addition of Kamakee Vista carry-over and block splits/reorganization as necessary for HH properties. As noted above and below, some original HCDA block data were then either (a) replaced by information generated by VIA, including adjustments for continued or redeveloped Industrial uses; or (b) in a few cases, supplemented by HCDA data for specific projects entitled since the original HCDA dataset was compiled. These cases were:

  - Symphony Honolulu (Block 6) – Assumed to be original HCDA Future Baseline 2035 Building #2. However, in 2013 HCDA provided updated square footage information replacing that for one building in the original database.

  - 801 South Street – Phases I and II plus reduction in total space for the existing historic News Building (Block 14). Project data provided by HCDA replaced all that contained in the original HCDA Future Baseline for Block 14.

- For the KS and HH blocks identified previously in Table 2.1, initial square footage inputs were provided by VIA based on landowner Master Plans. VIA also provided square footage inputs for the KS-owned Block 57 – which is not expected to be affected by TOD – to reflect Master Plan approvals obtained since the HCDA dataset was completed in 2010.

- These initial figures lacked some elements required by Nelson\Nygaard and/or JMK Associates, and so we adjusted or supplemented the VIA inputs as follows.

  - **Residential Unit Counts:** These were derived first by separately estimating Luxury, Market, and Reserved Unit[8] percentages and unit sizes, and then

[8] Under the current *Mauka Area Plan*, developers are required to "reserve" a certain amount – generally 20% of the total residential floor area – for "workforce housing," which means buyers able to afford housing priced for households earning up to 140% of the Area Median Income as defined by the U.S. Dept. of Housing and Urban Development. These "Reserved Units" remain at controlled prices for five years (if initially for sale) or 15 years (if initially for rentals), after which they may be sold at prevailing market rates. For further specifics, see Hawaii Administrative Rules, Chapter 15-218, Sept. 14, 2011,

calculating the weighted average unit size (adjusted to gross value by including common areas such as hallways). The total number of Residential SF estimated by VIA was then divided by this adjusted weighted average to yield unit counts. The assumptions used for this procedure are summarized in Table 2.3.

Table 2.3: Assumptions for Estimating Major Landowner Future Baseline Residential Unit Counts

	Luxury	Market	Reserved
% Distribution	35%	45%	20%
SF/Unit	2,000	1,100	850
Weighted Average Unit Size (SF, Net),* Calculated	1,365		
Assumed % of Total Residential SF for Common Areas	18%		
Weighted Average Unit Size (SF, Gross),* Calculated	1,665		

* Net excludes common areas such as hallways, lobbies, etc.; Gross includes them.
Source: Calculations by JMK Associates, based on input assumptions from HCDA, reflecting recent project distributions and square footages by unit type.

  - **Non-Residential Land Use:** The initial VIA figures consisted of a single undifferentiated "Commercial" SF figure. Following the guidance of HCDA, JMK Associates allocated this VIA figure for each block as 70% Retail, 10% Office; and 20% Industrial.

  - **Parking:** Consistent with VIA input, the number of stalls was calculated based on the following assumptions:

Table 2.4: Assumptions for Estimating Major Landowner Parking Stalls

Associated Use	No. of Parking Stalls
Individual Parking Stall Area	340 SF
Market Residential	1.35 / Unit
Reserved Residential	0.90 / Unit
Commercial	1 stall / 444 SF

Source: HCDA, 2005 *Mauka Area Rules*

- For non-KS and non-HH blocks, Residential unit counts were calculated as follows, on a building-by-building basis:

  - For Residential buildings that carried over from the Existing dataset, original HCDA unit counts were retained. And for the two entitled projects, developer-projected unit counts were maintained. The typical range of gross average unit sizes for these buildings was 900 to 1,000 SF.

  - For new Residential buildings, the original HCDA Residential SF estimate was divided by the gross weighted average unit size calculated in Table 2.3 above, as this figure was felt by HCDA to typify most recent projects.

http://dbedt.hawaii.gov/hcda/files/2013/02/Ch.-218-Kakaako-Reserved-Housing-Rules-EFF-2011-11-11.pdf.

- Following all the above steps, Block Total SF for Future Baseline were compared to similar SF totals for the Existing dataset. Some cases were found when the Future Baseline totals were less than for Existing, which should not occur. These discrepancies were resolved as follows:

  - Very small discrepancies (ca. 200 SF or less) were ignored, with the concurrence of HCDA, as being due to rounding procedures in the original data spreadsheets.

  - For two blocks (Kapiʻolani Block 23 and Sheridan Block 9), original HCDA spreadsheets assumed redevelopment but had no parking. As per 2013 HCDA instructions, we allocated Existing Garage Parking SF numbers to new Future Baseline buildings that seemed closest in characteristics to the original buildings that did have parking.

- As a final step, the assumed total Future Baseline SF numbers for all KS blocks (aggregated) were compared to estimated entitled SF numbers for KS, and the same was done for HH blocks. The differences were negligible (under 1%) for KS, and became negligible for HH after the data were examined for accuracy and a few appropriate corrections were made, in consultation with VIA, to the final output.

Makai Area (including Aloha Tower Special District Site)

- VIA generated development assumptions for Makai blocks reflecting current Makai Rules. Except for the few blocks noted immediately below, VIA's initial input to this analysis assumed an undifferentiated "Commercial" square footage for each block that did not include parking numbers.

- JMK Associates followed VIA's assumptions that all Makai blocks would be redeveloped in this scenario – primarily for Office use, but also for a potential Presidential Library to house papers of President Obama – except the following, which would be carried over from the Existing dataset:

  - Block 100 (Gold Bond Bldg.);
  - Block 101 (Children's Discovery Center);
  - Parts of Block 103 (retaining JABSOM and a warehouse);
  - Block 105 (Gateway Park);
  - Parts of Block 106 (containing Re-Use Hawaiʻi and the Maritime Center).

  The above retained structures include some limited existing Industrial uses – no new Industrial is assumed for Makai areas.

- For other Makai sites (including the Aloha Tower Special District Site), JMK Associates followed VIA assumptions for redevelopment, with these additional steps:

  - With HCDA guidance and concurrence, we assumed VIA's "Commercial" square footage number for each block would be distributed as 20% Office and 80% Retail (no Industrial).

  - Because VIA output did not include parking, we estimated Garage Parking by applying a multiplier of (340/444 = 0.766) to VIA's total "Commercial." This was determined by a VIA-specified standard parking stall = 340 SF, and 1 parking stall/ 444 SF of commercial land use.

- As with the Mauka data, Block Total overall SF for Future Baseline were compared to similar totals for Existing. No blocks were found where the Future Baseline numbers were smaller than the Existing ones.

2.1.5 Assumptions and Procedures for TOD Alternatives A and B

The following procedures were used in the original 2013 analysis of TOD Alternative A and were then replicated exactly in 2014 for Alternative B (which was identical to Alternative A except for lower heights/densities in certain blocks designated by VIA).

Mauka Area

- Unless VIA assumed different development patterns for a geographical area under the TOD Alternatives than under the Future Baseline Condition, JMK Associates carried over the Future Baseline Condition figures to both of the TOD Alternative analyses. These were all blocks *except* those previously listed in Table 2.1 and Table 2.2.

- VIA generated TOD Alternative projections for TOD-affected KS and HH blocks – numbers larger than for the Future Baseline Condition – and also for the "Other TOD Blocks." Again, the VIA data lacked a few elements required by JMK Associates and/or Nelson\Nygaard, and these were estimated by JMK Associates through the same procedures and assumptions previously specified to generate additional information in the Future Baseline Condition, sometimes with certain exceptions as noted below:

  For the "Other TOD Blocks" (Non-KS and Non-HH):

  - **Residential Unit Counts:** Assumptions used to convert VIA total "Residential SF" into unit counts were identical to those in the foregoing Table 2.3.

  - **Non-Residential Land Use:** JMK Associates used VIA estimates for specified categories of Retail, Commercial/Office, Parking Garage, and Entertainment/ Other. The latter category consisted of possible Blaisdell redevelopment uses such as movie theaters, and for our purposes these "Entertainment" uses were simply added back into Retail.

  - **Parking:** For these blocks, VIA itself calculated parking square footage, which JMK Associates directly incorporated.

For the TOD-Affected KS and HH Blocks –

- o Residential unit counts through assumptions shown in foregoing Table 2.3, though applied to a larger potential development volume as estimated by VIA;
- o Distribution of VIA's initial generic "Commercial" square footage as 70% Retail, 10% Office; and 20% Industrial (again applied to a larger amount of space as estimated by VIA for the each of the TOD Alternatives);
- o Parking totals calculated for the assumed level of development under the Future Baseline were retained – however, VIA then estimated additional development permitted under the higher-density TOD Alternative Rules, and parking for the additional increments were calculated as per VIA's assumptions shown above in Table 2.4.

- Two potential Mauka-area hotels were assumed (in addition to one in the Makai area, as described below). While the proposed TOD Alternatives do not restrict the nature of potential hotels to the following description, these illustrative parameters were assumed for purposes of analysis (square footage from VIA, ensuing estimated number of units from JMK Associates):
  - o At the current Blaisdell complex site, a full-service hotel – for travelers desiring to stay outside Waikīkī – of 204,000 SF (434 units) for TOD Alternative A and of 167,371 SF (356 units) for Alternative B;
  - o In the Auahi Neighborhood Zone, a condo-hotel of about 104,000 SF (195 units) for TOD Alternative A and of 168,949 SF (317 units) for Alternative B. (Although overall densities were lower for selected blocks in Alternative B than Alternative A, this particular building was an exception in VIA's calculations.)
- Checks were again made to detect cases where the overall Block Total SF was improperly lower for the TOD Alternative than for the Future Baseline Condition. A few issues were identified that required attention from HCDA and VIA. In a few cases, JMK Associates was advised that the discrepancies were acceptable, and the remaining issues were remedied.

Makai Area (including Aloha Tower Special District Site)

- As per VIA assumptions, JMK Associates carried over "Future Baseline Condition" figures for all blocks except the Aloha Tower Special District Site.
- For the Aloha Tower Special District Site, we used VIA figures, which were complete in the sense of including parking and explicit breakdown of Office and ground-floor Retail.

VIA estimated development of total Residential square footage at the Aloha Tower Special District Site under the TOD Alternative A (which remained the same for Alternative B). We calculated residential unit counts using the same assumptions as set forth previously in Table 2.3.

- At the Aloha Tower Special District Site, which abuts Downtown Honolulu, a business hotel (175,000 SF, 372 units) was assumed for both TOD Alternatives.
- As with the Mauka data, Block Total overall SF for the TOD Alternatives were compared to similar totals for the Future Baseline Condition. After due checking and revisions, two blocks remained where the TOD Alternative numbers were smaller than the Future Baseline Condition ones. For one (portion of Block 48 not owned by Howard Hughes), the difference was small and VIA instructed us the apparent discrepancy was within acceptable range of error.

  For the Blaisdell redevelopment site (Block 7B+C), differences were larger, but HCDA instructed us that the differences were still acceptable, reflecting possible future lower density.

2.2 Estimated Kaka'ako-Specific Population – Methods and Assumptions

Methods for estimating population (Chapter 4) are simpler to explain in concept, though the actual analysis was greatly complicated by the differences in building types for the three scenarios, with some buildings surviving, some buildings changing, and some future block data available only at aggregated rather than building-specific levels.

2.2.1 Types of Populations Studied

Two basic categories of population are estimated:

1. Full-time residential; and
2. De facto (number of people actually present *in units* on an average day – excludes an unknown and exceedingly difficult-to-estimate number of customers for retail and restaurant operations, which could vary greatly by time of day).

De facto population has three components:

- Full-time residents actually present (i.e., the full-time residential population *minus* those temporarily absent on vacations, business trips, etc.);
- Part-time residents, who are expected to comprise a somewhat larger percentage of the Kaka'ako population in the future as high-rise development offers more amenities such as ocean views and proximity to both downtown and Waikīkī); and

- Visitors staying in the three hotels with the Kaka`ako District envisioned by HCDA and VIA for this analysis.

2.2.2 General Locations Where Population Can Stay or Reside

Population is associated with Residential land uses – or, in the case of visitors, Hotel uses. These are confined to:

- The Mauka portion of Kaka'ako, not the Makai lands (except for the small Kewalo Basin population not associated with any housing units).
- For both TOD Alternatives (but not the Future Baseline), the Aloha Tower Special District Site is assumed to have residential development.

2.2.3 General Approach to Population Estimates

Initial Step: For any particular location or structure with Residential or Hotel uses, determine: (a) Total number of units; and (b) Whether structure is for Residential use or Hotel use. (No mixed residential-visitor uses are permitted under current or proposed new Rules, so all structures with population would be either one or the other.)

For Residential-use structures, further determine (c) Percentage held for part-time use; and (d) Percentage occupied full-time. Remaining units are (e) considered vacant and available for full-time use. Then (f) occupancy factor for full-time residents would equal available vacant units divided by (full-time occupied + available vacant units).

Population Calculations: Table 2.5 shows how to calculate various population types associated with residential housing or visitor units.

Table 2.5: Logic of Population Calculations

Population Type =	Units/Base		Occupancy %		Household Size
A. Full-Time Residential Population =	No. Residential Units Not Held for Part-Timers	x	Occupancy Factor for Full-Time Residents	x	Average Household Size (AHHS) for Full-Time Residents
B. De Facto Population =	*(Sum of Three Components Below)*				
• Full-Time Residents Actually Present	Population Computed in (A)	x	(100% - Avg. % Off-Island)		
• Part-Time Residents Actually Present	No. Residential Units Held for Part-Timers	x	Avg. % of Year Part-Timers Present	x	AHHS for Part-Time Residents
• Average Visitor Count	Total Hotel Units	x	Avg. Occupancy for That Type of Hotel	x	Average Party Size for That Type of Hotel

For purposes of this analysis, decisions were first made as to whether the required input parameters could vary *by place* (i.e., are "place-specific" and thus more accurate) within Kaka'ako or would be fixed across all locations. Census data permit some assumptions

to be very place-specific within Kaka'ako, but place-specific data are not available for other parameters; data sources for them are more general and therefore fixed across all Kaka'ako locations. For hotels, the question is less whether the variation is by area than by type (e.g., traditional full-service resort hotel vs. condo-hotel). See Table 2.6:

Table 2.6: Whether Population Parameters Are Fixed or Could Be Place-Specific

	Full-Time Residential	De Facto: Full-Time Residential Component	De Facto: Part-Time Residential Component	De Facto: Visitor Component
AHHS	Place-Specific*	N/A	Fixed Over Areas	Both Specific to Hotel Type
Occupancy	Place-Specific*	Fixed Over Areas	Fixed Over Areas	

* More accurately: *Possibly* Place-Specific. Kaka'ako-wide numbers were used as a back-up option in certain cases where place-specific parameters could not be determined from Census data. This proved to be the case in a number of situations – see Section 2.2.5.

At the same time, decisions were made as to whether population parameters for this analysis would vary *by time* (i.e., Existing, presumed to be 2010, versus Future Baseline Condition and/or TOD Alternatives, all of which future scenarios are presumed to reflect 2035 build-outs under different Rules). As explained in the next section, most were fixed over time – see Table 2.7:

Table 2.7: Whether Population Parameters Vary by Time or Remain Fixed

	Full-Time Residential	De Facto: Full-Time Residential Component	De Facto: Part-Time Residential Component	De Facto: Visitor Component
AHHS	Fixed Over Time	N/A	Fixed Over Time	N/A; Only Future Values Are Used
Occupancy	Fixed Over Time	Fixed Over Time	Fixed Over Time	

2.2.4 Population Parameters with Fixed Values in This Analysis

Specific Residential Values: Table 2.8 presents specific assumed values and sources for parameters fixed by both place and time.

Table 2.8: Values for Population Parameters Fixed Over Both Place and Time

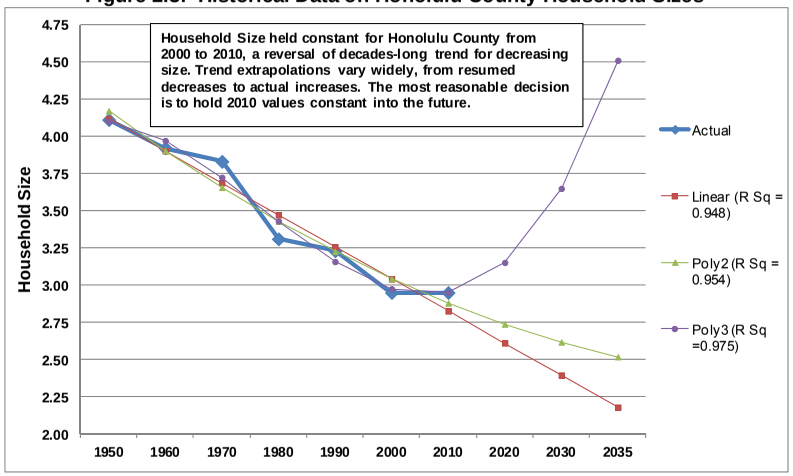
	Existing	Future	Source	Comments
% Full-Time Residents Actually Present*	94.5%	94.5%	"State of Hawaii Data Book Timeseries" http://hawaii.gov/dbedt/info/economic/databook/Data_Book_time_series/ Accessed March 4, 2013	Future figure kept constant for purposes of conservative analysis -- will in reality be affected by travel prices.
Part-Time Resident Average HH Size	2.14	2.14	Weighted average of estimates from Kaka'ako condominiums gathered in survey by JMK Associates, Jan. - Feb. 2013.	Lack of trend data requires assumptions fixed over time.
Part-Time Resident Occupancy	39.0%	39.0%		

* Equivalent to "Occupancy" for "De Facto: Full-Time Residential Component" in Table 2.6.

Residential Values That May Vary by Place but Remain Fixed Over Time: While assumed full-time residential AHHS and occupancy rates may vary by location – i.e., are possibly "Place-Specific" in Table 2.6 – they are assumed in Table 2.7 to remain the same for any particular location in the Existing vs. Future Baseline Condition or TOD Alternatives (A or B). This assumption of lack of change over time is a critical one, particularly for AHHS. A future decrease in household size could mean less population even if the number of occupied residential units remained constant.

In fact, household sizes in the City and County of Honolulu overall had fallen in each decennial Census – *until* the 2010 Census, when they held steady and even very slightly increased, from 2.95 to 2.96. This may reflect the intensifying pressures on the Hawai'i housing market, which is one of the most expensive in the nation. Figure 2.3 shows the trend analysis along with three possible trend lines extrapolated to the future: a linear trend, a 2nd-order polynomial trend, and a 3rd-order polynomial trend line.

Figure 2.3: Historical Data on Honolulu County Household Sizes



Note that what is being established here is not the actual value of the average household size for any place within Kaka'ako, which will be addressed in the following Section 2.2.5, but rather the principle that whatever 2010 value is used for a particular place in Kaka'ako will remain constant in the future. That decision to hold place-specific AHHS constant over time for various locations within Kaka'ako reflects:

1. A compromise among the greatly differing trend extrapolations in Figure 2.3, with the flat line from 2000 to 2010 considered the best available *recent* trend;

2. The principle in EIS work that estimates should err, if at all, on the conservative side – a lower AHHS would mean less population and so the decision not to assume future declines results in a larger and thus more conservative estimate; and

3. The HCDA's emphasis on attracting families to Kaka'ako, which would mean a countervailing force to what might otherwise be an argument for a decreasing household size – i.e., the aging of the overall population, resulting in expectations of lower household sizes, particularly in dense urban areas.

Hotel Population Parameters for the TOD Alternatives: HCDA requested inclusion within this analysis of three different hotel types – (1) a traditional full-service hotel for travelers desiring to stay outside Waikīkī; (2) a condominium-hotel (which usually has significantly fewer guest amenities); and (3) an urban business hotel (which would usually have lower occupancy levels and lower party sizes, as fewer family members accompany business guests). A "business hotel" of course could also be patronized by *kama'āina* from other islands or even out-of-state leisure travelers, but if it is primarily aimed at the business traveler, it would likely have somewhat fewer amenities than a traditional resort hotel.

Although no hotels are in the "Existing" dataset of Kaka'ako structures, determining the future parameters for calculating the visitor population requires estimating a reasonably correct "Existing" value and then making judgmental assumptions about future values. Table 2.9 and Table 2.10 show assumed values and sources/rationales for the two key input parameters of average party size and hotel occupancy level.

Table 2.9: Visitor Population Parameters by Hotel Type – Average Party Size

Hotel Type	Existing*	Future	Source	Comments
Full-Service Hotel for Travelers Wanting to Stay Outside Waikīkī	2.20	2.35	Based on examination of "Hotel-Only" party size from various *Annual Visitor Research Reports***	Party size increasing as hotel rates rise, which is assumed to continue due to limited supply as demand increases.
Condo-Hotel	2.31	2.55	Based on examination of "Condo-Only" party size from *Annual Visitor Research Reports***	Party size also increasing over time, and likely to keep doing so as hotel rates force larger parties into condos.
Business Hotel	1.70	1.80	Based on examination of "Meetings, Conventions, Incentive" (MCI) party size from Annual Visitor Research Reports.	Hawai'i has no real pure business hotel now. MCI party sizes reflect Waikīkī situation; non-Waikīkī locations would attract fewer families.

* Not directly used in this analysis, but indirectly used as basis for assumed future value.
** Now prepared by Hawai'i Tourism Authority, formerly by Hawaii State Dept. of Business, Economic Development and Tourism (DBEDT). See http://www.hawaiitourismauthority.org/research/reports/.

Table 2.10: Visitor Population Parameters by Hotel Type – Occupancy Level

Hotel Types	Existing*	Future	Source	Comments
Full-Service Hotel for Travelers Wanting to Stay Outside Waikīkī	78.0%	82.0%	*Annual Visitor Research Reports.* 78% = O'ahu average during 2002-07 economic cycle (and 10-year average from 2002 to 2011 almost as high).	Assumed to rise in future because of increasing demand relative to supply. Peak Waikīkī occupancies actually higher now due to international demand, but this could reflect transient exchange rate situation.
Condo-Hotel	70.0%	74.0%	No published data formally available; estimates based on opinions of hotel experts contacted by JMK Associates.	
Business Hotel	68.0%	70.0%		

* Not directly used in this analysis, but indirectly used as basis for assumed future value.

2.2.5 Residential Population Parameters Assumed to Be Place-Specific in Kaka'ako

Parameters and Census Equivalents: For this analysis, three final population parameters varied by area (i.e., were "place-specific") within Kaka'ako, with various final assumptions ultimately derived from the 2010 U.S. Census. These were –

1. Percentage of units in residential buildings for part-time residents;

2. Percentage of remaining units in residential buildings vacant – i.e., adjusted vacancy factor used to determine "occupancy factor for full-time residents" (Table 2.5);

3. Average household size (AHHS) for full-time residents.

For each of these, the Census provides *block-level* data for GEOID codes ("GEOIDs").[9] These GEOIDs, mostly though not perfectly, correspond to the VIA blocks used for this analysis. Specifically, the Census provides the following place-specific information used to generate assumptions for the above three parameters –

1. Percentage of housing units "vacant," with vacancies allocated to different categories. One vacancy category is "Held for Seasonal, Recreational, or Occasional Use" (SROU). This would usually mean part-time residential use.

2. Total vacant units *minus* the SROU vacant units would generate the adjusted vacancy level used to determine "occupancy factor for full-time residents."

[9] GEOIDs are the basis of the worldwide numbering system for land areas; they are used to link data series to particular land areas. The U.S. Census creates GEOIDs by stringing together numbers for the State FIPS (Federal Information Processing Standard) code, the county FIPS code, the Census tract code, and the Census block code. For example, VIA Block 46 has a GEOID of 150030038003007. In the Census numbering system, the code for Hawai'i is 15; the code for City and County of Honolulu is 003; the code for the relevant Kaka'ako Census Tract is 003800; and the block identifier is 3007.

3. Total population in households divided by total occupied full-time residential units provides an Average Household Size factor (AHHS).[10]

This place-specific *block-level* 2010 data provided an initial basis for developing assumed values for the three population parameters under discussion here. It did not necessarily provide a final basis because the 2010 values for any particular GEOID block would logically depend on the mix of building types present on that block. This mix might change in the future scenarios. Therefore, it was ultimately necessary to generate *building-level* values for each of the three parameters by general area within Kaka'ako.

A final small place-specific population involved the only population for Makai lands – Kewalo Basin (Census count of 223 in 2010, held constant in all future scenarios).

Census 2010 Versus HCDA Existing Database: Before the procedures for generating the building-level values are explained, it is useful to note there were substantial differences between the 2010 Census housing unit count and the number of units generated by HCDA in 2009 for the "Existing" Database.

For some parts of Kaka'ako, the Census found more units than reported in the HCDA Existing dataset, but overall HCDA had 36% more residential units than the Census reported for the following year. The pattern by Neighborhood Zone suggests the Census found more units in low- to mid-rise areas, while HCDA found more in high-rise areas (Table 2.11).

Table 2.11: Housing Unit Estimates – 2010 Census Versus HCDA "Existing"

	HCDA "Existing"*	2010 Census
Sheridan Neighborhood Zone (N.Z.)	431	461
Thomas Square District N.Z.	554	442
Civic Center N.Z.	185	242
Kapi'olani N.Z.	2,426	1,454
Central Kaka'ako N.Z.	509	1,201
Auahi N.Z.	3,004	1,326
Pauahi N.Z	1,221	1,005
Makai + Aloha Tower Special District Site	0	0
KAKA'AKO TOTAL	**8,330**	**6,131**

* These HCDA unit counts are based on sums of units for each building story in the original database, prior to adjustments described in Section 2.1.4, such as the addition of the Kamakee Vista project, which occurred as a result of this comparison of Census and HCDA numbers. The final unit count for the adjusted HCDA "Existing" database for this analysis was 8,619.

While the Census takes care to train its workers carefully, experience has shown it is not a perfect procedure either. JMK Associates cannot judge which set of numbers is

[10] The Census also provides data for Total Population including those *not* in households. The Kaka'ako-wide Total Population was about 5% greater than the Population in Households as of 2010. The difference was primarily due to (a) temporary group quarters/shelters located in the Civic Center Neighborhood as of 2010, since gone; and (b) live-aboard population at Kewalo Harbor. The first group can safely be ignored for future population projections, while the 223 population for Kewalo was held constant for both the Future Baseline and also the two TOD Overlay Alternatives.

more accurate for the "Existing" situation. In most ways, ***this discrepancy is irrelevant for this impact assessment, which is ultimately based on the difference between the Future Baseline Condition's and the two TOD Alternatives' (A or B) numbers.***

However, because the Future Baseline numbers come substantially from the corresponding HCDA projections for build-out under current Rules, and because the HCDA Existing database goes to the building level (which the Census does not), JMK Associates necessarily chose to:

- Build "Existing" scenario results on HCDA rather than Census unit counts; but
- Apply 2010 Census-based parameters such as Average Household Size to the HCDA units for *all* scenarios – Existing, Future Baseline, and TOD Alternatives A and B.

Procedures for Developing Place-Specific Population Parameters at the Building Level: These procedures assign values for the three place-specific parameters – percentage of units for part-time residents, adjusted residential occupancy, and AHHS – as a function of (a) location, and (b) building type. The procedures were as follows:

1. Assemble a candidate list of residential "Building Types" for which parameters theoretically might differ. This initial list consisted of:
   - Generic low-rise buildings (1 to 3 stories);
   - Generic mid-rise buildings (4 to 11 stories);
   - Generic high-rise towers (12+ stories);
   - Luxury towers;
   - Workforce housing;[11]
   - Elderly housing.
2. For the Existing scenario, determine which blocks are
   - "Uniform" in the sense of consisting entirely of residential buildings that are of only one of the foregoing Building Types. Further specify if this is "Uniform Low-Rise," "Uniform High-Rise," etc.
   - "Mixed," in the sense of consisting of different types of residential buildings.

   The reason for doing this is that Census GEOID values for a Uniform block can reasonably be applied to all buildings on that block. For example, if the AHHS value is, say, 2.13 for a Uniform block, it is reasonable to use the 2.13 value for each

[11] As defined in the 2011 Mauka Area Rules, §15-218-16, a workforce housing project "means new residential project(s) where at least seventy-five percent of the residential units are set aside for purchase by families earning between one hundred to one hundred forty percent of the [Area Median Income], which does not require assistance from … governmental bodies, and which meets the size requirements set forth" elsewhere in the chapter.

building on the block – similar buildings in the same location may be assumed to have the same household sizes. But if the block is Mixed, this combined 2.13 value is much more likely to be an average of very different values for different buildings.

3. Determine Census GEOIDs that (a) corresponded well with original HCDA blocks (prior to any splitting of those blocks that may later have been required); and (b) are Uniform in a particular way from the preceding Step #2. When one or more such cases occurred, also compute for each building type a weighted average for the Neighborhood Zone (i.e., Sheridan, Auahi, etc.) and for Kaka'ako as a whole.

   There are two reasons for doing this:

   - The first is to aid in decisions about which of the initial candidate "Building Types" have distinctive values for the various population parameters and which have sufficiently similar values to other buildings that they can be dropped from the list.
   - The second is to assist in developing "Principles" that will dictate what population parameter values are to be applied to different building types in Mixed blocks and/or to future scenarios where density increases greatly.

   The remaining steps below also contribute to both of these two purposes.

4. For "Building Types," use information from the above steps to determine if the more specialized types of buildings under consideration – luxury towers, workforce housing, elderly housing – had sufficiently unique characteristics (when compared to other buildings of similar heights) to justify retaining them on the list. If some types are dropped, then repeat steps #2 and #3 with the revised list, as there may now be fewer blocks that would be considered Mixed and more that would be Uniform.
5. For "Principles," determine if variation across places within Kaka'ako was sufficient to justify use of place-specific population parameters or if the differences were so minimal that Kaka'ako-wide averages might as well be applied. For these Principles, "place-specific" would mean *Neighborhood Zone* weighted averages, rather than the values for given blocks. That is because the Principles are, for the Existing scenario, primarily for the purpose of applying to buildings within Mixed blocks only, where block values cannot be applied to each building.

   If some Neighborhood Zones have no Uniform blocks from which values can be derived, finalize the Principles for Mixed blocks by using values from contiguous Neighborhood Zones.

6. Finally, for the Future Baseline Condition and both TOD Alternatives (A and B), determine for each block:
   - If it is Uniform in a particular way for the Existing situation, is it Uniform in the same way in future (e.g., is a Uniform Low-Rise block ca. 2009/2010 still

projected to be a Uniform Low-Rise block in 2035, whether or not the residential buildings appear to be identical)?

- If it is Mixed for the Existing situation, do the exact same residential buildings carry over into a future scenario, with no additional residential construction?

The reason for doing this is that these are conditions under which the 2010 Census values for AHHS, etc. can appropriately be used again in the future. The "Principles" are for the purpose of assigning population parameters in future situations where these conditions do *not* apply.

Place-Specific Parameters Developed from These Procedures: The procedures described above resulted in these outcomes –

1. ***Final List of Building Types Used in Analysis:*** From the initial candidate list, these categories survived:

   - Generic low-rise buildings (1 to 3 stories);
   - Generic mid-rise buildings (4 to 11 stories);
   - Generic high-rise towers (12+ stories);
   - Elderly housing.

   Blocks consisting of workforce housing projects did not have distinctive AHHS or residential population parameters compared to other nearby buildings of similar heights. This simply suggests that Kaka'ako households of lower incomes have similar household sizes as higher-income households, despite likely smaller unit sizes. In a suburban area, this might not be true, as people who can afford larger homes might be at a stage of their lives where they have larger families. However, it proved true in Kaka'ako. Workforce projects *did* have expectably lower (and almost negligible) percentages of units for part-time residents (what the Census termed "vacant" but held for "Seasonal, Recreational, or Occasional Use," SROU). But as no known pure workforce towers are planned for the future, this issue could be resolved by having a second set of Principles only for the SROU parameters; existing workforce projects would not use these, but would use actual Census data.

   Known luxury towers differed from other high-rises mostly in terms of the percentage of units apparently held for part-time use (SROUs). These variations in SROU proved a function of location – towers in certain areas are more likely to be developed with amenities and available views that appeal to part-time residents. So by developing a separate set of Neighborhood-specific Principles just for this parameter, it was no longer necessary to specify "luxury tower" as a separate Building Type – that will be effectively accomplished by noting the location.

2. ***Final Principles for Estimating the Population Parameters when 2010 Census Block Information Cannot Be Used:*** The "Principles" apply to Mixed blocks, existing and future, and to much greater future densities. As noted, two separate

sets of Principles were developed, one for % of SROU/part-time units, and another for AHHS and adjusted full-time residential vacancy after subtraction of SROU units.

For the most part, examination of Census data suggested that Kaka'ako-wide values could be used. The exception was SROU/part-time units for high-rises (following Table 2.12). Note there are a few areas in which Principles do not apply due to non-development.

However, for adjusted vacancy rates and AHHS, the values are applied to all Neighborhood Zones under the Principles. Again, these values are for cases when the 2010 Census values cannot logically be used – primarily Mixed blocks.

Table 2.12: Principles for Assigning Percentage of Units to Part-Time Use

Neighborhood Zone	High-Rise	Mid-Rise	Low-Rise	Elderly[a]
Sheridan	N/A	3.0% for all areas	0.5% for all areas	0.0% for all areas
Thomas Square District	3.6%			
Civic Center	4.0%[c]			
Kapi'olani	6.9%			
Central Kaka'ako	11.7%[d]			
Auahi	29.8%			
Pauahi, *below* Pohukaina St.[b]	10.8%			
Pauahi, *above* Pohukaina St.[b]	1.1%			
Makai	N/A	N/A	N/A	N/A
Aloha Tower Special District Site (Both in TOD Alternative A and in TOD Alternative B)	29.8%	N/A	N/A	N/A

[a] Applies to just two buildings in Existing dataset, only one of which survives in future scenarios.
[b] As SROU percentage likely reflects views, it was necessary to split Pauahi, which has a substantial portion located nearer the ocean and another portion farther from the ocean.
[c] Based on average of nearby Neighborhood Zones.
[d] This figure excludes SROU percentages from workforce projects, which would not apply in future.

Table 2.13: Principles for Assigning Values of Adjusted Vacancy Rates and Average Household Size

	High-Rise	Mid-Rise	Low-Rise	Elderly[a]
Vacancy Rates, All Areas	4.73%	4.32%	4.41%	0.0%
Avg. Household Size, All Areas	1.98	1.40	2.22	1.18

[a] Elderly value applied to surviving Pohulani building in future, after additional development creates a Mixed block that still includes that project.

2.2.6 Final Population Calculation Procedures

Full-Time Residential Population and Residential Components of De Facto – Existing Scenario

1. For the Existing scenario, start with the number of units in each building and each block to complete the following steps.

2. For each building in each block, use the basic logic in Table 2.5, with appropriate specific values as follows for various Building Types.

3. For each Building Type in each block, use the specific population parameter values as follows (following Table 2.14), according to whether it is a Uniform or a Mixed block.

4. For each population type – full-time residential and the residential components of de facto population – sum the building populations to get total block populations. Sum the block populations to get Neighborhood Zone populations. Sum the Neighborhood Zone populations to get Kaka'ako-wide populations for the Existing scenario.

Table 2.14: Final Procedures for Residential Population Calculation (Existing)

	Uniform Blocks	Mixed Blocks
% Units for Part-Time (SROU) Use	Block-specific 2010 Census values	Appropriate value from Table 2.12
Adjusted Occupancy Factor for Full-Time Residents		100% minus appropriate value from Table 2.13
Avg. HH Size for Full-Time Residents		Appropriate value from Table 2.13
Avg. HH Size for Part-Time Residents	Appropriate values from Table 2.8	Appropriate values from Table 2.8
Occupancy Factor for Part-Time Residents		
% Full-Time Residents Actually Present		

Full-Time Residential Population and Residential Components of De Facto – Future Baseline Condition and the TOD Alternatives (A and B)

1. For each of the three future scenarios, repeat Steps #1 to #3 listed immediately above for the Existing scenario. *However*, also apply the specific population parameters developed in the "Principles" exercise not only to Mixed blocks but also to "Uniform" blocks that have changed profiles compared to their "Existing" condition.

   That is, if an "Existing" block with a Uniform profile of one density type (such as all Low-Rise) for a future scenario has a Uniform profile of a different type (such as all High-Rise), then it is no longer appropriate to use block-specific 2010 Census values. It is only appropriate to use the 2010 Census values for things like average household size if the block was Uniform in 2010 and is still Uniform in the same way for the future scenario. Thus, the logic of Table 2.14 is slightly modified when applied to the future scenarios (Table 2.15):

Table 2.15: Final Procedures for Residential Population Calculation (Future Baseline Condition or TOD Alternatives A and B)

	Blocks That Are Uniform in Same Way They Were Uniform in Existing Scenario	Blocks That Are Mixed or Uniform in Different Way Than They Were Uniform in Existing Scenario
% Units for Part-Time (SROU) Use	Block-specific 2010 Census values	Appropriate value from Table 2.12
Adjusted Occupancy Factor for Full-Time Residents		100% minus appropriate value from Table 2.13
Avg. HH Size for Full-Time Residents		Appropriate value from Table 2.13
Avg. HH Size for Part-Time Residents	Appropriate values from Table 2.8	Appropriate values from Table 2.8
Occupancy Factor for Part-Time Residents		
% Full-Time Residents Actually Present		

Note: Blocks for which VIA provided new square footage estimates on an aggregate basis, without specifying individual buildings, have all been categorized as "Uniform High-Rise." It is possible that some actual future structures on these blocks may be low- or mid-rise elements wrapped around towers, but the assumption is that such cases will usually involve master-planned city blocks that effectively function as a single integrated structure, and the high-rise tower components would dominate the basic character of the blocks.

2. For each population type – full-time residential and the residential components of de facto population – again sum the building populations to get total block populations. Sum the block populations to get Neighborhood Zone populations. Sum the Neighborhood Zone populations to get Kaka'ako-wide populations for the Future Baseline Condition and both TOD Alternatives.

3. For full-time residential population, subtract Future Baseline populations from populations for each TOD Alternative to get "impact" of each TOD Alternative.

Visitor Population Component of De Facto Population (TOD Alternatives Only) and Total De Facto Population (All Scenarios)

1. For each TOD Alternative, start with the number of units in each Hotel type and complete the remaining steps.

2. For each Hotel Type, use the basic logic at bottom of Table 2.5, with appropriate specific values for various Hotel types from Table 2.9 and Table 2.10 to get visitor populations for hotel structures.

3. In all scenarios – Existing, Future Baseline, and both TOD Alternatives – sum the various components of de facto population (full-time residents actually present, part-time residents present, visitors present) to get total de facto for each block.

   Sum the block de facto populations to get Neighborhood Zone de facto populations. Sum the Neighborhood Zone de facto populations to get Kaka'ako-wide de facto population.

4. For total de facto population, subtract Future Baseline Condition figures from similar figures for each TOD Alternative figures to get "impact" for de facto population for each TOD Alternative (A or B).

2.3 Estimated Kaka'ako-Specific Operational Employment – Methods and Assumptions

"Operational employment" (results in Chapter 5) means jobs associated with operating businesses, as opposed to "Construction employment," methods for which are described in the following Section 2.4.

2.3.1 Types of Operational Jobs Studied

Consistent with typical economic impact procedures, combined direct jobcounts (full- and part-time) are estimated. These are a sum of jobs associated with each of the following specific uses previously calculated through the methods described in Section 2.1:

- Residential (e.g., building managers, maintenance, security)
- Hotel
- Civic/Public (includes Children's Discovery Center)
- Office
- Retail
- Industrial
- Surface Parking
- Garage Parking
- JABSOM, in the Makai area

Following discussions of methods and assumptions for statewide/islandwide impacts (Section 2.6 and Section 2.7) will distinguish between "direct" jobs and "total" jobs with economic multiplier effects. For purposes of analyzing Kaka'ako-specific operational jobs – as well as the subsequent discussion of Kaka'ako-specific construction employment – ***only direct jobs are considered.*** That is because it is appropriate to include multiplier effects only for those project components that would not otherwise occur somewhere on the island without the proposed project. The subsequent islandwide analysis includes such multiplier effects, but the Kaka'ako-specific analysis does not.

2.3.2 General Approach to Kaka'ako-Specific Operational Employment Analysis

Calculation Procedures: There were two general approaches –

1. For the great majority of instances, jobs were calculated as a product of the square footage for a particular use (e.g., Office or Retail) times an assumed employment multiplier (jobs per 1,000 SF) specific to that use. For Residential and Hotel uses, the multipliers were in terms of jobs per unit. As explained shortly, use-specific multipliers differed for each future build-out scenario (Future Baseline Condition and the TOD Alternatives A and B) from those used for the Existing Scenario calculations.

2. For a few instances relating to existing activities, known job numbers could be identified, based on information from the respective agencies: (a) The existing HECO power plant at the "Aloha Tower Special District" had a current jobcount of about 40 in 2013. The facility has since been placed on standby basis, but is projected for redevelopment under all future scenarios. (b) JABSOM currently has a jobcount of 240, and the School does not expect changes in the future. (c) Kewalo Harbor officials estimate the current jobcount (including concessionaires) as about 200, and believe it could grow to 250 in the future.

Labor Productivity and Implications for Future-Scenario Multipliers: Due to technology and other labor-saving innovations, fewer workers are generally needed over time to achieve the same level of economic output. This is recognized in the State Input-Output (I-O) Model, which uses year-specific multipliers that forecast fewer jobs over time for the same level of sales.

Unlike the I-O methodology (described in following sections and used for other parts of this study), which is based on dollar output, the appropriate approach for this operational-job component involves multipliers based on jobs per SF or jobs per unit – i.e., physical size of the economic activity. Productivity over time can have differing effects on different spatial job multipliers that apply to different economic activities:

- For many or most uses, the required space for a given level of economic activity is *fixed*, and the implication is that future jobs per 1,000 SF will be less than at present. For example, a grocery store or a restaurant requires a certain amount of space, and so labor-saving technology implies future job multipliers will be *lower*.

- Office space, however, is different.[12] As the number of employees required for the same level of economic activity shrinks, *and* the space needed for each worker

[12] For this study, we regard *only* Office uses as different in the sense of appropriately requiring a higher rather than lower multiplier in the future. In theory, some types of Civic/Public uses might similarly be affected, but major Kaka'ako examples such as McKinley High School or government office buildings are more similar to restaurants and grocery stores, in that they do not have the option to move into smaller spaces when increased labor productivity results in demand for fewer employees.

declines due to technology (e.g., less physical file storage needed), businesses simply lease less space. This means that future job multipliers will be *higher*.

In practice, it also means that demand for Office space is slowing, and that the sort of Office space projections contained in both TOD Alternatives (or, to an even greater extent, the Future Baseline Condition) may in practice be very unlikely to materialize by 2035. This part of HCDA's vision may well require more time to materialize.

Fixed vs. Place- or Building-Specific Employment Multipliers: As with population parameters, a decision was required whether to keep job multipliers fixed for all parts of Kaka'ako or assume different multipliers for different places or different building types. As described shortly, most were fixed, making for a simpler analytic procedure.

2.3.3 Operational Employment Multipliers with Fixed Values in This Analysis

Except for jobs associated with Residential and Hotel buildings (see following Section 2.3.4), all multipliers were fixed across Kaka'ako. Table 2.16 shows the multiplier values applied to square footage for the six land/building use categories using that method, and briefly notes the basis of the *Existing* Scenario values. The immediately following discussion explains the basis for estimating the three *Future* scenario values.

Table 2.16: Employment Multipliers Per 1,000 Square Feet for Various Uses

	Existing	Future	Source / Comments
Civic/Public	2.500	2.059	City multipliers for these categories were developed based on 1990 data but have not since been updated. JMK Associates updated to 2010 ("Existing") based on a review of about a dozen studies and planning guides.* Updated values maintained roughly the same internal ratios among the four multipliers from the City's original study of the early 1990s.
Office	4.000	4.545	
Retail	2.000	1.642	
Industrial	1.667	1.397	
Surface Parking	0.042	0.034	"Existing" based on calls to Hawai'i parking garages and a national planning guide.
Garage Parking	0.017	0.014	

* Most of the available literature was not Hawai'i-specific, but a few – including Hawai'i Retail numbers from the International Council of Shopping Centers – were specific to Hawai'i.

The Future values in the table above (for the Future Baseline Condition and both TOD Alternatives A and B) were developed as follows:

- For the Civic, Retail, and Industrial categories, the City's 1990 values were taken as a baseline, and the average annual growth rate between each 1990 value and the assumed 2010 value was calculated. This average growth rate was used to project a 2035 ("Future") value. These average growth rates were between -0.7% and -0.8%.

- The Garage Parking 2010 value was then projected to the future using a -0.75% average annual growth rate, based on the above. Surface Parking, a very minor category in the future when little is assumed to be left, was assigned an average annual growth rate of -0.85%, resulting in just one future job.

- As per above discussion, the Office category was the only one for which the multiplier was to be assigned a positive growth rate. The future value was assumed on a more judgmental basis, with a slower growth rate of +.60%, to restore it to the approximate level of the City's multiplier for 1990.

2.3.4 Operational Employment Multipliers Assumed to Be Building-Specific in Kaka'ako

Residential: The number of jobs associated with managing or maintaining Residential complexes is relatively small, but the large total amount of new Residential structures envisioned under the Future Baseline Condition and (especially) the two TOD Alternatives A and B justified outreach to various building and property management firms for current structures in Kaka'ako and elsewhere in urban Honolulu. Based on these interviews, it was apparent that *job ratios vary with the level of amenities* for the building – e.g., more jobs per unit for luxury condominium projects.

Thus, the first step was to generate assumed multipliers for multi-unit Residential structures with varying amenity levels:

Table 2.17: Employment Multipliers Per Unit for Residential Structures

Amenity Level	Existing	Future	Source / Comments
High	0.025	0.021	Based on information from Kaka'ako and Urban Honolulu property managers. Future values were estimated at 82% of current values, reflecting typical declines in other multipliers listed above in Table 2.16.
Mid	0.060	0.049	
Low	0.100	0.082	

The next step was to decide which buildings in the various datasets should be considered to have high, mid, or low amenity levels. It is extremely difficult to forecast future amenity level for each structure in the build-out of all projects in all parts of Kaka'ako. The HCDA encourages as much affordable housing as possible, while many landowners/developers see more market opportunities at a higher end during certain portions of the economic cycle.

Therefore, the strategy taken was to effectively generate a variety of amenity levels by linking the assumed amenity level to the projected level of part-time residents (per discussion in foregoing Section 2.2.5, Table 2.12), as higher-amenity projects tend to attract higher proportions of off-shore buyers. The linkages assumed were:

Table 2.18: Linkage Between Residential Job Multipliers and Part-Time Residents

Amenity Level	Percentages of Part-Time Residents
High	20% or higher
Mid	10.1% to 19.9%
Low	10% or lower

Because this approach is building-specific, the allocation of assumed amenity levels did not end up neatly corresponding to particular Neighborhood Zones within Kaka'ako, but high-amenity structures tended to be concentrated in the Auahi and Aloha Tower Special District areas, while areas such as the Sheridan Neighborhood Zone were generally assumed to have low-amenity buildings both now and in the future. Mid-amenity buildings were most often assumed for parts of Pauahi, Central Kaka'ako, and Kapi'olani Neighborhood Zones.

Hotel: As with Residential apartments and condominiums, Hotel job multipliers are a function of amenity level, as well as things like average occupancy. As with assumed Hotel party sizes and occupancies, it was necessary first to assume an "Existing" multiplier – though there are no existing hotels in Kaka'ako – and use that as a basis for projecting future values. The assumed values were as follows (Table 2.19):

Table 2.19: Employment Multipliers Per Unit for Hotel Structures

Amenity Level	Existing*	Future	Source / Comments
Full-Service Visitor Hotel	0.80	0.66	Existing job multipliers based on interviews with hotel industry experts. Future values were again estimated at 82% of current values, reflecting typical declines in other multipliers listed above in Table 2.16.
Condo- Hotel	0.50	0.41	
Business Hotel	0.70	0.59	

* Not directly used in this analysis, but indirectly used as basis for assumed future value.
Note: Estimated multipliers based on consultation with industry. Actual labor rates may vary as a result of hotel developer decisions. Timeshares (with much lower multipliers) are not permitted in either of the TOD Alternatives.

2.3.5 Final Kaka'ako-Specific Operational Employment Calculation Procedures

The procedures were the same for all scenarios and all parts of Kaka'ako, and were carried out first at the building level:

1. Allocate specific jobcount figures for HECO, JABSOM, and Kewalo Bay to appropriate blocks.

2. For building uses with multipliers based on square feet, multiply the number of square feet by the appropriate multipliers from Table 2.16.

3. For Residential and Hotel structures, multiply the number of units by the appropriate multipliers from Table 2.17 and Table 2.19.

4. In all scenarios – Existing, Future Baseline, and both TOD Alternatives (A and B) – sum the various results by type of use to get total jobcounts for each block. Sum the block jobcounts to get Neighborhood Zone totals. Sum the Neighborhood Zone totals to get Kaka'ako-wide totals. Subtract Future Baseline from each TOD Alternative's numbers to get respective "impacts" by area or Kaka'ako-wide.

2.4 Estimated Kaka'ako-Specific Construction Employment – Methods and Assumptions

For Construction employment (results in Chapter 6), only the Future Baseline Condition and the two TOD Alternatives were analyzed. Existing structures or infrastructure are already in place and will generate no new construction.

"Construction jobs" for this analysis primarily relate to development of new structures (e.g., residential apartments or stores), but secondarily also to any needed new infrastructure (e.g., wastewater) or new public facilities in the area if and as needed (e.g., a new police sub-station).

As will be seen, the methodology for estimating construction jobs flows from estimated costs. Cost inputs for public facilities and infrastructure derive from sources and procedures described in more detail in the following Section 2.5 (and, for infrastructure, in Chapter 7). The procedure for estimating costs and then jobs for structures was more complex. Therefore, the present discussion focuses primarily on construction of new structures, albeit with presentation of multipliers for infrastructure and public facilities as well.

2.4.1 Types of Construction Jobs Studied

For new structures, the categories of analysis are similar to those used before, with some differentiation for Residential and Hotel:

- Residential (by type – low-rise, mid-rise, and high-rise)
- Hotel (by type – full-service leisure, business, condo-hotel)
- Civic/Public
- Office
- Retail
- Industrial
- Garage Parking

While only combined job figures from all these uses will be reported, these include two basic components:

1. Jobs related to "hard costs" – i.e., spending for actual on-site construction; and

2. Jobs related to "soft costs" – i.e., spending for architectural and design services, permitting, local finance activity, etc. These could be in or outside of Kaka'ako.

As with operational jobs, the numbers here represent direct jobs only.

2.4.2 General Approach to Kaka'ako-Specific Construction Employment Analysis

Meaning of Job Numbers: The standard approach to measuring construction employment is in terms of "job-years," not individual workers. The methods described

below generate jobcounts inclusive of both full- and part-time jobs for individual years, so that summing counts over years might or might not include the same construction jobs (and workers filling them) from one year to the next.

Calculation Procedures: The Hawai‘i State Input-Output (I-O) 2007 Inter-County Model was used to estimate construction-related employment, based on:

- Construction dollars spent in the Hawai‘i economy, broken down by …
- Particular broad economic sectors.

As detailed shortly, overall construction dollars for each new structure were estimated based on assumed dollars per SF for that type of structure, times square footage for each new structure as determined through methods and sources previously described in Section 2.1. This yielded a total construction cost for each new building.

The I-O model assumes that $1 million spent in one sector (e.g., food processing) produces a different level of economic activity, including different job-year counts, than $1 million spent in another sector (e.g., telecommunications). The relevant I-O economic sectors for this analysis were:

1. “Construction of Other Buildings” (i.e., “other” than single-family homes) – applicable for hard costs for all structures.
2. “Heavy and Civil Engineering Construction” – applicable for hard costs for needed new infrastructure.
3. “Architectural and Engineering (A&E) Services” – which represent the bulk of assumed soft costs.

The I-O Inter-County Model works differently for expenditures made in each county in Hawai‘i. The O‘ahu sector values were selected for this analysis, as Kaka‘ako is part of the City and County of Honolulu.

As will be noted later in Section 2.6, I-O results from the Inter-County Model technically yield *statewide* results for “total” impacts, including multiplier or “ripple effects.” But the parts of the Model used for this Kaka‘ako-specific analysis focus on “direct” jobs only. These would likely be located entirely on O‘ahu – most of them at Kaka‘ako jobsites but some at construction headquarters or A&E offices elsewhere on the island.

Timeframe and Labor Productivity Issues: It is not possible to predict exactly what structures will be developed in exactly which year or even which decade. Therefore, the analysis focuses simply on *cumulative job-years for the build-out of each future scenario* (Future Baseline Condition and both TOD Alternatives).

This is based on the somewhat artificial conceit that there will be a point in time – for purposes of this EIS designated as the year 2035 – at which all new structures and any needed infrastructure will be complete and frozen in place for a period of time. In reality, of course, some structures may never be built, and others may be erected and then demolished and redeveloped before others are even begun.

Again, the nature of this analysis reflects a particular HCDA vision and assumes it will be realized in a certain way … and the associated numbers are properly interpreted as order-of-magnitude estimates rather than precise predictions.

The lack of a timetable raises an issue for use of I-O direct employment multipliers. The I-O model assumes that increasing labor productivity over time means the same expenditure in any sector will generate progressively fewer jobs as each year goes by – i.e., the multipliers are year-specific and grow lower with time.

Furthermore, the current I-O model provides the basis for calculating sector-specific employment multipliers only from the year 2007 through the year 2017. The current model discounts the multiplier by 5% each year (i.e., assumes 5% fewer jobs per $1 million in real expenditures as each year goes by) – a linear pattern that would eventually result in near-zero jobs.

The timeframe/productivity issues were addressed as follows:

1. An average construction date mid-way between 2010 and 2035 – i.e., sometime around mid-2022 – was assumed.
2. The current I-O model is based on Economic Census and other source data for 2007. Type II multipliers for previous I-O models (based on data for 1997,[13] 2002, and 2005) were plotted for each of the three sectors (“Type II” multipliers actually include indirect and induced jobs, not just the direct jobs being estimated here, but they are used to help determine appropriate direct job ratios, as discussed in the immediately following Section 2.4.3.)

   Though this approach provided only a small number of points for each sector, the patterns were *not* linear (see Figure 2.4 for the example of “Construction of Other Buildings,” the most critical sector). Several different types of trend-lines were mapped and extrapolated for all three sectors. Logarithmic trend-lines and extrapolations provided the best common approach for all three sections. For the example in Figure 2.4, this yielded a mid-2022 value of 11.0.
3. Similar procedures were followed for Type II multipliers for the other two sectors used in the construction employment analysis, generating initial Type II multiplier

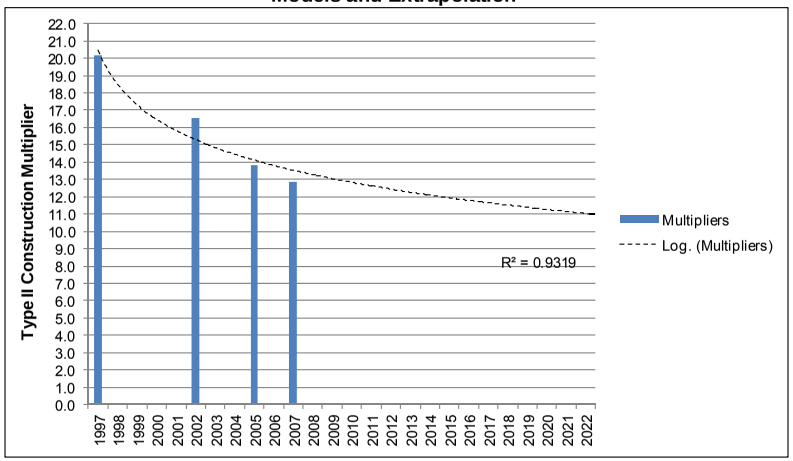
[13] The 1997 I-O Model was differently organized, and the 1997 Type II Multiplier shown in Figure 2.4 reflects an average of *State* Model multipliers for construction of multi-family buildings, commercial buildings, and hotels.

values of 12.0 for "Heavy and Civil Engineering Construction" and 11.0 for "Architectural and Engineering Services."

Fixed vs. Place-Specific Employment Multipliers: Two key types of multipliers are involved –

- I-O multipliers yielding jobs from construction dollar values were *fixed* for each sector across all parts of Kaka'ako – i.e., they do not vary by location.

Figure 2.4: Construction Job Multipliers ("Other Buildings") from Recent I-O Models and Extrapolation



- However, average construction cost per SF was assumed to be greater for new structures in Neighborhood Zones located closer to Ala Moana Blvd. and the ocean – i.e., Pauahi and Auahi, as well as the Makai and Aloha Tower Special District zones.

2.4.3 Construction Employment Multipliers with Fixed Values in This Analysis

The State's 2007 I-O Model specifies Type II job multipliers by year, but *direct* job ratios (yielding immediate employment without "ripple effects" through the economy) must be calculated for the year 2007 and then discounted for future years by the same proportions that Type II multipliers are discounted. The final direct job ratios for the mid-2022 average construction year timeframe are shown for each of the three relevant sectors in the final column of Table 2.20:

Table 2.20: Calculation of Direct Job Multipliers, Construction Employment

	Type II Job Multipliers		Discount	Direct Job Ratios	
	2007	Mid-2022	(2022/2007)	2007	Mid-2022*
Construction of Other Buildings	12.9	11.0	85.5%	4.20	**3.59**
Heavy and Civil Engineering Construction	18.3	12.0	65.5%	9.40	**6.16**
Architectural and Engineering Services	14.5	11.0	76.1%	6.38	**4.85**

* The Mid-2022 Direct Job Multiplier equals 2007 multiplier times discount factor from Type II multipliers.
Source: Hawaii State 2007 Inter-County I-O Model, http://dbedt.hawaii.gov/economic/reports_studies/

Another value held constant in analysis was the percentage of total construction spending assumed to be for "soft costs" (represented by the Architectural and Engineering sector). Based on input from Kaka'ako landowners and reviews of other materials, this was set as 6%.

2.4.4 Construction Multipliers Assumed to Be Place-Specific in Kaka'ako

The total ("all-in") assumed average construction cost-per-SF values used in this analysis are shown in the following Table 2.21. Note that these are based on *current* costs. Construction costs vary over time, and are likely to escalate in the near future due to factors such as materials such as probable rising labor costs and increased demand for steel or other materials from expanding economies in Asia. However, it is difficult to predict what market adjustments will occur because of these factors, and so current figures are maintained for purposes of this analysis.

Figures in Table 2.21 apply to costs associated with new structures. These represent the great majority of potential new construction activity. For infrastructure and public facility costs, estimates were based on direct total numbers as described in following sections.

Table 2.21: Assumed Construction Costs Per SF, by Neighborhood Zone

	Pauahi, Auahi, ATSD, Makai	Rest of Kaka'ako	Source / Comments
High-Rise Residential	$480	$300	Based on input from various Kaka'ako landowners, general Honolulu contractors, and standard construction cost estimation handbook (RS Means Building Constuction Cost Data Book 2013, Honolulu Averages)
Mid-Rise Residential	$400	$250	
Low-Rise Residential	$340	$210	
Civic Buildings	$300	$250	
Office Space	$450	$250	
Retail Space	$300	$175	
Industrial Space	$125	$125	
Garage Parking Space	$250	$125	
Condo-Hotel	$400	N/A	
Business Hotel	$350	N/A	
Full-Service Visitor Hotel	N/A	$400	

2.4.5 Final Kaka'ako-Specific Construction Employment Calculation Procedures

The procedures were primarily carried out at the building level, as follows –

1. Determine which structures in the Future Baseline Condition or TOD Alternatives (A or B) were carried over from the Existing dataset, and exclude these from analysis. There were relatively few such buildings – about 9.3% of all "Existing" dataset buildings[14] were projected by HCDA's original spreadsheets, VIA, or HCDA 2013 updates to survive in Future Baseline dataset, and about 8.3% also survived in each of the TOD Alternatives (A or B) prepared for this analysis.

2. For each of the three future scenarios, calculate total all-in construction costs for each new building or development complex by multiplying total SF times construction costs shown in Table 2.21.

3. For each future scenario, assign 6% of the total construction value to "soft costs" and the remainder to "hard costs."

4. For each future scenario, multiply the "hard cost" total dollar amount by the direct job multiplier for "Other Buildings" – and the "soft cost" total dollar amount by the direct job multiplier for "Architects and Engineers" – shown in Table 2.20. Add the resulting two worker-year figures to get Total Job-Years. These figures are related to private structures assumed to be developed within Kaka'ako Neighborhood Zones.

5. For each future scenario, repeat steps #3 and #4 with the estimated total dollar value for any assumed required new public facilities or infrastructure (but for infrastructure, using the "Heavy and Civil Engineering" direct job multiplier from Table 2.20). These figures generally cannot be assigned to any one known Neighborhood Zone, and are thus separately shown as "Unallocated" in tables of results.

6. In all future scenarios – Future Baseline, and both TOD Alternatives (A and B) – sum the various building results to get total jobcounts (job-years) for each block. Sum the block jobcounts to get Neighborhood Zone totals. Sum the jobcounts for public facilities and infrastructure to get total "Unallocated" numbers. Sum the Neighborhood Zone and Unallocated totals to get Kaka'ako-wide totals. Subtract Future Baseline Condition numbers from numbers for each TOD Alternative to get respective "impact" by area or Kaka'ako-wide.

2.5 Estimated Effects on Kaka'ako Public Services and Facilities

Analysis of public services and facilities (Chapter 7) was conducted at two levels:

[14] The total number of Kaka'ako buildings in the final "Existing" dataset used for this analysis – the original HCDA dataset with Makai additions and other small modifications described in Section 2.1.1 – was 481, primarily located in the Mauka portion of Kaka'ako.

- Kaka'ako-specific; and
- Islandwide.

2.5.1 Overview of Methodological Approach

In general, information was gathered through one or both of two overall methods:

1. Direct inquiries to relevant State or County agencies;

2. Analysis of recent published documents to determine per capita operational costs and/or service availability.

The first method was given priority – if an agency was able to supply cost estimates, those estimates were accepted and used in the analysis. JMK Associates developed its own estimates and reports these in Chapter 7 only if the appropriate agency was unable to provide estimates.

The "public service" topics and relevant agencies are as follows (Table 2.22):

Table 2.22: Public Service Categories and Relevant Agencies

Topic	Relevant Agencies
Public Safety	City Fire Department City Police Department
Public Health	City Emergency Services Department Hospital availability (primarily private)
Education	State Dept. of Education
Parks and Recreation	City Dept. of Parks and Recreation HCDA

Public service and facility impacts involve both (a) assessment of adequacy of service for the public; and also (b) cost impacts for the agency. The two are of course inter-related, but the communication process yielded somewhat more frequent and specific information about cost impacts, as not all agencies have fixed standards about "adequacy" of service or facility levels. Information about service adequacy at the Kaka'ako-specific level is often incorporated in sub-sections labeled "Other Impacts" in the various parts of Section 7.2.

Particularly for public agencies, two separate types of cost "impacts" are of concern:

- **Operational Requirements and Costs** – primarily required additional personnel (but may also include supplies, equipment, etc.) required to maintain standards of service;

- **Capital Costs** – this refers to construction costs of required new *facilities* (e.g., schools), but also of public *infrastructure* (e.g., roads, water) needed for each

scenario. These costs were derived from past HCDA studies, supplemented by information from other project team consultants, as described further in Chapter 7.

Finally, an important overall principle for this analysis is that ***costs for islandwide impacts are independent of, and generally smaller than, Kaka'ako-specific impacts.*** This reflects the explanation previously given in Chapter 1, Section 1.6 about Kaka'ako-specific impacts being mostly due to shifts in population or economic activity expected to occur anyway, but islandwide impacts being due only to elements of the TOD Alternatives that would generate economic activity presumed not to occur otherwise (primarily construction of the three new hotels).

The islandwide public service/facility/infrastructure cost impacts are thus attributable only to this limited new economic activity and associated population. While Kaka'ako-specific costs may be estimated by agencies, the presumption for this analysis is that identical or highly similar costs would still be required on an islandwide basis for the population or economic activity "shifted" into Kaka'ako by the TOD Alternatives A or B.

For example, Honolulu Police Department personnel needs are estimated in Chapter 7 using the formula of 8.9 officers per 10,000 de facto population. As used in the Kaka'ako-specific analysis, this formula results in an estimate of additional police personnel costs that would be needed *in Kaka'ako* under TOD Alternative A or B – but might mostly still be required somewhere else on the island under the Future Baseline Condition. However, as used in the islandwide analysis, the formula yields the net islandwide additional police personnel needs associated only with the limited new economic activity generated by the TOD Alternatives.

Two important notes are associated with this principle of different and smaller islandwide costs than Kaka'ako-specific costs:

1. This is in no way an attempt to say that HCDA or Kaka'ako landowners/developers are immune from various agency growth impact fees just because "growth would happen anyway." Government operational and capital costs are required to pay for growth wherever it occurs, and HCDA has committed to working with agencies such as the State Dept. of Education (DOE) that have established such fees.

2. It should be acknowledged that some agency cost impacts could be slightly different if the additional Kaka'ako population growth permitted under TOD Alternatives A or B happened "somewhere else on the island." For example, DOE's impact fees differ depending on whether new housing units are multi-family units located in urban Honolulu or single-family units located in the Leeward suburbs. The problem is that it is impossible to say where the additional Kaka'ako population permitted under TOD Alternatives A or B would choose to live under the Future Baseline Condition, and so location-specific multipliers cannot always be applied. Given that TOD Alternatives A or B would result in more people living in Honolulu multi-family units, it seems reasonable to assume many would otherwise still be living in other Honolulu multi-family units with identical DOE multipliers.

2.5.2 Further Methodological Details

Methods were ultimately *agency-specific*, and these methods are described in various parts of Chapter 7. That is, each public agency had its own way of estimating impacts and cost implications. For example, the State DOE used certain fixed assumptions about school enrollment impacts for projected new developments, while other agencies responded to the inquiries on a much more judgmental basis – i.e., they did not indicate whether their assumptions about costs or other impacts were based on fixed multipliers or simply on their in-house experience and expertise.

Thus, while JMK Associates sent the same basic project descriptions and projected population effects to each agency, we did not prescribe nor request a standardized basis for agency use of this information to determine impacts. We simply reported agency responses.

In some cases, because of the complexity of the analytic framework (e.g., difference between "Kaka'ako-specific" and "islandwide" impacts), there was initial agency confusion about what was intended, and a series of communications was needed to clarify what was needed for this assessment. If and as needed, JMK Associates generated its own tentative assessments based on things such as recent budgets divided by population, and sent these to agencies for approval or revision. But unless otherwise stated in Chapter 7, no results are presented here that did not have at least tentative agency approval following these oral and written communications.

Because of the agency-specific nature of the analyses, there is a potential for conceptual inconsistency among the various analyses. For example, some analyses stress uncertainties in Kaka'ako-specific impacts related to the fact that service areas may extend past Kaka'ako itself into other portions of urban Honolulu, and it is unknown how much population might grow in the overall area under the Future Baseline – while other analyses do not touch on this issue. These differences reflect the nature of different agency-specific communications.

Finally, it should be noted that ***all agency communications took place in 2013 and actually focused only on the Future Baseline and what is now labeled "TOD Alternative A,"***[15] as TOD Alternative B was not developed until 2014. However, as will be shown in the various following chapters focusing on analysis results, it was readily apparent that Alternative A was the more intensive or "worst-case scenario" in comparison to TOD Alternative B. Furthermore, the TOD Alternative B results for things like residential units, population, and operational jobs were still fairly close to the Alternative A – with estimated levels more than 90% of those for Alternative B.

[15] The numbers shared with public agencies in late 2013 were revised slightly *downwards* in subsequent analyses. That means agency estimates of needs can be considered conservative, relative to the final numbers in this study.

Therefore:

1. If an agency said in 2013 that impacts from TOD Alternative A would require some new facility (without providing any computations or formulas), it was reasonably but conservatively assumed that the same facility at the same cost would still be required for the lower-density TOD Alternative B.

2. If the agency provided formulas or concurred with computations proposed by JMK Associates in 2013, those formulas/computations were simply run again in 2014 with new inputs (generally population or residential units) for TOD Alternative B.

As noted above, the complexity of this project required lengthy communications and generated some initial agency confusion in 2013, and so the 2014 approach – which built on the 2013 results – seemed an appropriate and conservative method.

2.6 Estimated Statewide/Islandwide Construction-Related Impacts – Methods and Assumptions

Results are in first part of Chapter 8. As earlier discussed (Sections 1.6.2 and 1.6.3, and again above in Section 2.5.1), islandwide impacts are actually smaller than Kaka'ako-specific ones because they are limited only to those elements that are assumed not to occur *anywhere on the island* unless a TOD Alternative (A or B) is implemented.

For construction-related impacts, these are essentially limited to (a) development of three hotels; and (b) any increment in construction of public facilities or infrastructure resulting from islandwide (not Kaka'ako-specific) population growth. A small additional source of economic impacts associated with the construction phase – initial purchases by part-time residents – is described below in Section 2.6.2. The same section provides further detail on how "islandwide" impacts are usually virtually identical with "statewide" impacts."

While smaller in magnitude than Kaka'ako-specific impacts, islandwide economic impacts have more elements (i.e., there are other types of impacts besides employment) and yet the methodology is simpler in that the inputs are primarily limited to hotel and potential additional public facility/infrastructure construction costs.

2.6.1 Types of Islandwide Construction-Related Economic Impacts Studied

The analytic procedure generates four types of economic impacts:

1. Output, or level of economic activity, measured in dollars;

2. Household earnings associated with this activity;

3. Employment (along with population supported by these jobs); and

4. Total State tax revenues and General Excise Tax (GET) returned to City and County of Honolulu for rapid transit purposes (although these are actually used for the later government fiscal cost-revenue analysis).

Each of these is presented at two different levels:

a. *Direct impacts* flowing from the initial round of expenditures (for employment, direct impacts would be identical to the Kaka'ako-specific results generated through methods and assumptions discussed previously in Section 2.4); and

b. *Total impacts*, including economic multiplier effects as dollars "ripple" through the economy. These total impacts sum the effects of two different types of expenditure "ripples:"

   - Indirect effects, when businesses buy from other businesses; and
   - Induced effects, when employees spend their wages and salaries.

   The calculated total impacts are statewide, although they would be overwhelmingly located on O'ahu, as explained below.

2.6.2 General Approach to Islandwide Construction Impact Assessment

Kaka'ako-specific impacts were determined by summing various results for the Future Baseline Condition and both TOD Alternatives (A and B), and subtracting to determine "impact." But islandwide impact calculations can *begin* with changes in key inputs (expenditures) and apply multipliers to determine impacts such as employment – a more succinct approach that generates the same end results.

Primary Analysis: The approach used here is a standard application of the Hawai'i Input-Output (I-O) Model developed by the Hawai'i State Dept. of Business, Economic Development, and Tourism (DBEDT) to measure the relationships among different sectors of the Hawai'i economy.

Specifically, the 2007 Hawai'i Inter-County I-O Model was used, as this allows calculation of effects from expenditures made on the island of O'ahu in particular.[16] The 2007 I-O Model is the most recent available version.

The I-O model provides "Type II" multipliers for estimating the total effects, and also includes ratios (e.g., earnings to output, or jobs to output) which are in effect the direct multipliers. These multipliers are all applied to the initial round of Kaka'ako-specific construction spending (conceptually the same as "direct output") calculated for:

[16] http://dbedt.hawaii.gov/economic/reports_studies/2007-inter-county-io/.

- Hotels, by procedures previously described in Section 2.4;
- Public facilities and infrastructure (due to islandwide economic/population growth only), by procedures described in Section 2.5.

For employment impacts, the construction timing and labor productivity issues previously addressed in Section 2.4.2 on Kaka'ako-specific impacts were addressed exactly as described in that section, by using the estimated mid-2022 direct and total job multipliers calculated there. Also see discussions in Section 2.4.1 on hard and soft costs, and Section 2.4.2 on "job-year" concept.

The Inter-County I-O Model Type II multipliers actually generate *statewide* rather than O'ahu-specific *islandwide* results. Since the preliminary analysis was drafted in 2013, DBEDT has made available County I-O Models, including one for the City and County of Honolulu. JMK Associates has elected still to keep presenting statewide results only – and to consider them as practically synonymous with "islandwide" results – for several reasons:

1. The statewide results are more complete, and provide proper and appropriate inputs to the fiscal cost-revenue analysis for State government expenses.
2. The Honolulu County I-O Model Type II multipliers are so close to the statewide multipliers that it is always accurate to say the vast or overwhelming majority of total impacts would occur on O'ahu. Below (Table 2.23) are examples for the I-O Model sectors used for the primary Construction phase impact analysis, as explained further in immediately following text:

Table 2.23: Inter-County Versus County Multipliers for Construction Analysis

	Sector: "Construction of Other Buildings"			Sector: "Heavy and Civil Engineering Construction"			Sector: "Architectural and Engineering Services"		
	Honolulu County	Inter-County (Statewide)	County as % of State	Honolulu County	Inter-County (Statewide)	County as % of State	Honolulu County	Inter-County (Statewide)	County as % of State
Output	2.00	2.13	**93.7%**	2.04	2.15	**95.2%**	1.95	2.03	**95.9%**
Employment*	12.08	12.87	**93.9%**	17.53	18.32	**95.6%**	13.72	14.46	**94.9%**
Earnings	0.58	0.63	**92.5%**	0.62	0.64	**95.9%**	0.86	0.88	**97.3%**
State Taxes	0.13	0.14	**96.8%**	0.08	0.08	**94.7%**	0.13	0.14	**97.0%**

* 2007 value -- these multipliers vary by year, but 2007 is the base value

Thus, the combined total O'ahu results from these three sectors would be about 95% of the statewide value; employment and earnings also about 95%; and State taxes about 96%.

Secondary Analysis: A little-studied additional economic impact comes from part-time residents' initial expenditures on interior decoration and finishing, and in some cases large purchases such as on-island automobiles. This is properly considered as part of the "Construction" phase because, unlike ongoing operational impacts such as normal daily expenditures by part-time residents when on island, they are mostly a one-time

large expenditure that occurs before or about the same time as initial occupancy. Construction hard cost estimates typically exclude such expenditures.

In truth, there are no solid economic studies on this phenomenon, although assumptions here are partly based on discussions with a limited number of O'ahu Realtors. Results from this analysis should be considered very tentative, but are included because (a) they provide some recognition of this economic phenomenon; and (b) due to conservative assumptions (including no consideration of later spending for the same purposes when the units are resold to new purchasers), we are confident that these are underestimates of actual economic benefits.

2.6.3 Specific Multipliers and Related Assumptions

Four sets of multipliers – from four I-O economic sectors – were employed, as follows:

Table 2.24: Multipliers for Hard Costs (Hotels or Public Facilities)

Sector: "Construction of Other Buildings"	Direct	Total
Output	1.000	2.132
Employment*	3.588	11.000
Earnings	0.297	0.628
State Taxes**	0.069	0.136

* Adjusted for mid-2022
** Used in later fiscal cost-revenue analysis

Table 2.25: Multipliers for Soft Costs (All Construction)

Sector: "Architectural and Engineering Services"	Direct	Total
Output	1.000	2.033
Employment*	4.854	11.000
Earnings	0.595	0.884
State Taxes**	0.082	0.139

* Adjusted for mid-2022
** Used in later fiscal cost-revenue analysis

Table 2.26: Multipliers for Hard Costs (Infrastructure)

Sector: "Heavy and Civil Engineering Construction"	Direct	Total
Output	1.000	2.146
Employment*	6.157	12.000
Earnings	0.297	0.643
State Taxes**	0.016	0.083

* Adjusted for mid-2022
** Used in later fiscal cost-revenue analysis

Table 2.27: Multipliers for Initial Purchases of Part-Time Residents

Sector: "Retail"	Direct	Total
Output	1.000	1.827
Employment*	11.975	17.300
Earnings	0.363	0.584
State Taxes**	0.079	0.125

* Adjusted for mid-2022
** Used in later fiscal cost-revenue analysis

These multipliers[17] were applied to appropriate estimated direct output (i.e., estimated initial expenditures), except for Retail multipliers for initial purchases of part-time residents (Table 2.27). Retail multipliers were applied to the estimated total expenditure figures for this economic activity, which were calculated as follows (Table 2.28), based on previously calculated estimates of differences between the Future Baseline

[17] Technically, the "Direct" figures are *ratios*, and the Total figures are *multipliers*.

Condition and the two TOD Alternatives (A and B) for various levels of Residential condominium properties:

Table 2.28: Key Assumptions for Calculating Part-Time Resident Initial Expenditures

Type of Assumption	High Amenity	Mid Amenity	Low Amenity
Interior Finishing (Furnishings, Art, Home Entertainment, etc.)*			
Assumed Expenditure per SF	$25.00	$15.00	$5.00
Assumed Percent Spent on O'ahu	70%	80%	90%
Automobile Purchases**			
Assumed Average Value of Car Purchase	$30,000	$17,500	$5,000
Assumed Percent Purchasing Cars on O'ahu	50%	65%	80%

* Applied to change (from Future Baseline to each TOD Overlay Scenario) in square footage held by part-time residents, minus existing SF occupied by part-time residents

** Applied to change in units held by part-time residents, minus existing units occupied by part-time residents

Source: JMK Associates, based on discussions with O'ahu Realtors active in Kaka'ako

Amenity levels reflect the same building-specific projected proportions of part-time residents as set forth in preceding Section 2.3.4 and Section 2.2.5 before it. It should be noted that Realtors generally reported that more affluent purchasers spent more overall but also imported proportionately more from off-island.

Finally, population supported by total employment requires (1) assumed percentages of construction workers temporarily imported from off-island, and (2) an assumed number of dependents per Hawai'i worker. The proportion of non-Hawai'i construction workers can vary greatly over time depending on the level of construction activity, and no definitive estimate of an overall average is available. However, a conservative *average* 20% is assumed, reflecting Act 168, Hawai'i Session Laws of 2010, which requires contractors for certain State construction projects to employ at least 80% Hawai'i residents. The ratio of dependents per on-island worker is determined by using Census data to divide total O'ahu population (excluding estimated population in households by the total number of workers, a process yielding a population-to-worker ratio of 1.976.[18]

2.6.4 Final Islandwide Construction Impact Calculation Procedures

The procedures for this analysis were carried out at the level of *change* from the Future Baseline Condition to TOD Alternatives for each element (e.g., change in part-time residential economic activity, or each hotel building), as follows –

1. For each building or other element, begin with the previously determined incremental construction value, allocated to hard costs and soft costs. This provides the initial direct output value.

[18] Data source was U.S. Census American Community Survey 2011 three-year figures centering on 2010. There were 63,055 households with zero workers, and a conservatively small estimated household size of 1.0 for such household meant subtraction of 75,666 from the total population (954,140) before dividing by 44,552 workers to determine the 1.976 value.

For the initial part-time residential expenditures, direct output is estimated by multiplying the assumptions in Table 2.28 by the appropriate increment in *new* square footage or units held by part-time residents.[19]

2. Apply the various I-O multipliers shown in Table 2.24 through Table 2.27 to determine results for direct and total output, direct and total earnings, and direct and total employment. (Results for total State taxes are also calculated, but held for use in the subsequent government cost-revenue analysis.)

3. Resulting job numbers are multiplied by 20% to estimate numbers of out-of-state workers, and the remaining Hawai'i worker numbers are multiplied by 1.976 to determine local population supported by employment.

2.6.5 Interpretation of Results

It is important to note that results yield islandwide employment and economic activity created *or maintained* by project construction activity. Construction employment is episodic. During sustained construction downturns, the indirect and induced islandwide effects of construction may wither, affecting storekeepers or others not in the actual construction workforce. However, during more normal times, as construction workers move from one project to another, these indirect and induced effects are maintained as one project is completed and another begins.

It is also important to remember that the results reflect cumulative impacts of all construction over time between 2010 and the presumed build-out date of 2035. They would not occur at any one moment in time.

2.7 Estimated Islandwide Operations-Related Impacts – Methods and Assumptions

Islandwide operational impacts (second part of Chapter 8) reflect only (a) islandwide spending by hotel guests; and (b) incremental spending by additional part-time residents (increase from Future Baseline Condition to each TOD Alternative).

2.7.1 Types of Islandwide Operations-Related Economic Impacts Studied

These are exactly the same as for islandwide construction-related economic impacts: direct and total output, earnings, employment, and (for use in the subsequent government fiscal analysis) State taxes and GET returned to the City and County of Honolulu. (See foregoing Section 2.6.1.)

[19] As this step required identification and deduction of existing part-time residential SF or units, it was the only step in the islandwide analysis that required a further search of the modified HCDA datasets, in order to determine *new* part-time residential activity only.

The key difference between islandwide operational impacts and construction impacts is that operational impacts are presented in terms of *average annual effects* after a theoretical full build-out, while construction impacts are cumulative over time.

2.7.2 General Approach to Islandwide Operational Impact Assessment

As with islandwide construction impacts, islandwide operational impacts were calculated by applying I-O multipliers to an initial direct output (i.e., expenditure) figure. Such direct spending by hotel guests and by additional part-time residents is estimated in the following Table 2.29 by use of historical visitor expenditure data gathered by DBEDT or, in recent years, by the Hawai'i Tourism Authority (HTA). O'ahu-only expenditure data for visitors staying in hotels only or in condominiums only were weighted (by visitor-days per year) to produce average values in 2012 dollars for the three-year period from 2010 to 2012, and then increased by a standard 20% factor to reflect the likelihood that visitors in these properties would be somewhat higher-than-average spenders (as land values for urban Honolulu sites would almost certainly result in higher-than-average room rates).

The average daily figures in Table 2.29, particularly the total figures (with a slight adjustment for inter-island airfare), were then multiplied by 365.25 to generate annual expenditure figures, which provide the necessary annual direct output figures to be used with I-O multipliers.

2.7.3 Specific Multipliers and Related Assumptions

The I-O Model provides a set of "Visitor Expenditure" (VE) Type II multipliers appropriate for cumulative hotel guest spending, and a set of "Personal Consumption Expenditure" (PCE) Type II multipliers appropriate for residential spending, and the latter was used for part-time residents as well. The Type II multipliers are used for total effects. The sort of sector-specific information used to calculate direct construction multipliers in Section 2.6.2 and Section 2.6.3 are not provided directly in the model but may be calculated by a matrix-algebraic procedure that JMK Associates carried out after discussions with and direction from DBEDT economists.

Along with total State taxes, GET returned to the County is also calculated here for input to the later government fiscal cost-revenue analysis. The County portion is 0.5% of output *except* for the portion of direct output consisting of expenditures for lodging. That rate is 0.459%, for reasons explained subsequently in Section 2.8.4, Table 2.32 in conjunction with explanation of the effective room tax rate on O'ahu.

The same assumed population-to-worker ratio of 1.976 calculated previously (Section 2.6.3) on construction assumptions and methods) is again used to calculate annual population supported by total operational employment.

Table 2.29: Calculation of Estimated Daily Average Expenditure by Property Type

	Original Average Weighted 2010 - 2012 Expenditures		Adjusted Data Used for Analysis			
(in 2012 Dollars)	Hotel Only	Condo Only	Full-Service Hotel[1]	Business Hotel[1]	Condo-Hotel[2]	Part-Time Residents[2]
Total Lodging	**$95.84**	**$72.61**	**$115.00**	**$115.00**	**$87.13**	**$43.30** [3]
Total Food & Beverage	**$47.96**	**$34.08**	**$57.56**	**$57.56**	**$40.90**	**$40.90**
Food at Restaurants	$28.69	$17.79	$34.42	$34.42	$21.35	$21.35
Dinner Shows	$3.83	$2.52	$4.60	$4.60	$3.02	$3.02
Groceries	$4.27	$7.15	$5.13	$5.13	$8.57	$8.57
Unallocated exp in F&B	$11.18	$6.63	$13.41	$13.41	$7.95	$7.95
Total Entertainment	**$18.47**	**$11.57**	**$22.16**	**$22.16**	**$13.89**	**$13.89**
Attractions/entertainment	$4.41	$2.98	$5.29	$5.29	$3.57	$3.57
Recreation	$3.20	$2.67	$3.84	$3.84	$3.20	$3.20
Other entertainment & tours	$5.52	$3.27	$6.62	$6.62	$3.93	$3.93
Unallocated exp in entertainment	$5.34	$2.65	$6.40	$6.40	$3.18	$3.18
Total Transportation	**$16.24**	**$14.16**	**$19.49**	**$19.49**	**$16.99**	**$16.99**
Inter-island airfare	$3.45	$2.47	$4.14	$4.14	$2.96	$2.96
Ground transportation	$2.07	$1.13	$2.48	$2.48	$1.35	$1.35
Rental vehicles	$7.19	$7.72	$8.63	$8.63	$9.27	$9.27
Other transportation	$1.14	$1.18	$1.37	$1.37	$1.41	$1.41
Unallocated exp in Trans	$2.40	$1.66	$2.87	$2.87	$1.99	$1.99
Total Shopping	**$53.52**	**$28.46**	**$64.23**	**$64.23**	**$34.15**	**$34.15**
Fashion and clothing	$14.64	$9.52	$17.57	$17.57	$11.42	$11.42
Jewelry / watch	$5.54	$2.55	$6.65	$6.65	$3.06	$3.06
Cosmetics/perfumes	$1.93	$0.73	$2.32	$2.32	$0.88	$0.88
Leather goods	$7.29	$2.30	$8.74	$8.74	$2.76	$2.76
Hawaii food products	$2.31	$1.72	$2.77	$2.77	$2.06	$2.06
Souvenirs	$7.24	$4.44	$8.68	$8.68	$5.33	$5.33
Unallocated exp in Shopping	$14.58	$7.20	$17.49	$17.49	$8.65	$8.65
All Other	**$2.30**	**$1.87**	**$2.76**	**$2.76**	**$2.24**	**$2.24**
Cruise per person per day	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Unallocated exp in total	$0.38	$0.12	$0.46	$0.46	$0.15	$0.15
Total spending per person per day	**$234.72**	**$162.87**	**$281.66**	**$281.66**	**$195.44**	**$151.59**

[1] Assumed 20% increase in "Hotel Only" figure. [2] Assumed 20% increase in "Condo Only" figure.
[3] "Lodging" for Part-Time Residents based on assumed average annual condominium maintenance fee of $13,200, allocated to individual daily figure based on 365.25 days per year, and – from Table 2.8 – average party size of 2.14 and occupancy 39% of year.
Source: Special computer tabulations provided by HTA, July-August 2013, and subsequent assumptions and research by JMK Associates.

Table 2.30: Multipliers for Hotel Guest Expenditures

Visitor Expenditures (VE)	Direct	Total
Output	1.000	1.836
Employment*	6.916	14.100
Earnings	0.273	0.531
State Taxes**	0.073	0.122

* Adjusted for mid-2022
** Used in later fiscal cost-revenue analysis

Table 2.31: Multipliers for Part-Time Resident Expenditures

Personal Consumption (PCE)	Direct	Total
Output	1.000	1.558
Employment*	5.849	12.250
Earnings	0.233	0.440
State Taxes**	0.043	0.084

* Adjusted for mid-2022
** Used in later fiscal cost-revenue analysis

2.7.4 Final Islandwide Operational Impact Calculation Procedures

The procedures for this analysis were carried out at the level of *change* from the Future Baseline Condition to the TOD Alternatives for each element (e.g., change in part-time residential economic activity, or each hotel building), as follows –

1. For each type of hotel visitor or part-time resident, use the appropriate average daily visitor expenditure figure (minus 50% of inter-island airfare, as 50% assumed spent on O‘ahu) multiplied by 365.25 to calculate direct output.

2. Apply the various I-O multipliers shown in Table 2.30 and Table 2.31 to determine results for direct and total output, direct and total earnings, and direct and total employment. (Results for total State taxes and County share of GET are also calculated, but held for use in the subsequent government cost-revenue analysis.)

3. Resulting job numbers are multiplied by 1.976 to determine local population supported by employment.

2.7.5 Interpretation of Results

Again, it is important to note that results yield islandwide employment and other economic activity created *or maintained* by project operational activity. If nothing else changes in the economy, the results would be additional jobs, population, etc. However, if some other part of the economy weakens, these impacts could replace the fading components and thus maintain existing jobs, earnings, etc.

Additionally, it is always important to remember that results reflect build-out *scenarios* rather than specific plans. Small differences in results due to small differences in scenario inputs should not be taken as particularly meaningful.

For example, the TOD Alternative A scenario has three hotels totaling 1,000 units. Alternative B as developed in 2014 also has three hotels, with a slightly higher total unit count of 1,044. (This is one of the few specific ways in which the TOD Alternative B scenario had slightly more rather than less density compared to Alternative A.) In terms of statewide/islandwide economic impacts, the small effects of these additional hotel units are largely but not entirely offset by TOD Alternative B having fewer units for, and numbers of, part-time residents than Alternative A. This means some of the statewide/islandwide operational economic impacts are very marginally higher for TOD Alternative B than for Alternative A – but for all practical purposes both the inputs and also the operational impacts are identical.

2.8 Estimated Government Fiscal Impacts

2.8.1 General Approach to Fiscal Cost-Revenue Analysis

Government costs and revenues (those borne by taxpayers) are analyzed in Chapter 9 at two levels: (1) for the State; and (2) for the City and County of Honolulu. Both are appropriately analyzed on an islandwide basis. At each level, separate results are provided for:

- Construction phase (cumulative results for all construction);
- Operational phase (point-in-time annual figures).

This analysis is subject to a number of uncertainties and differences from typical fiscal cost-revenue analyses (which are usually applied to much more concrete and specific proposed projects) – see discussion in Section 9.2.

Although the results presented in Chapter 9 also include qualitative discussion about the general principles of cost-effectiveness of concentrated versus dispersed development, it cannot be clearly determined whether costs and revenues would differ significantly for the relatively small (on an islandwide scale) shifts of population or workers into or out of Kaka‘ako for the Future Baseline Condition versus either TOD Alternative (A or B). Therefore, the fiscal cost-revenue analysis is based only on those same project elements mentioned in the two preceding sections dedicated to islandwide impacts – i.e., development of three hotels and associated visitor spending; incremental changes in part-time resident spending; and changes in islandwide governmental public facility/infrastructure costs.

As with islandwide construction and operational impacts just discussed, the analytic technique *begins* with foregoing “impacts” that feed into the final analysis – e.g., the difference in expenditures subject to taxation between the Future Baseline Condition and each TOD Alternative. Some of the final costs or revenues were already determined as by-products of preceding analyses, and some are calculated in this step by applying additional multipliers here to other impact numbers.

2.8.2 Types of Costs and Revenues Included in This Analysis

Construction Phase – Government Costs: For both State and County governments, costs are estimated as the sum of –

- Previously determined infrastructure and/or facility construction costs; and
- Service costs for construction workers imported from out-of-state.

Construction Phase – State Revenues: Total State tax revenues were already determined as a by-product of the “Islandwide Construction Impact” assessment. These

came from summing up the various construction component revenues from the I-O Model State Tax multipliers specified in foregoing Table 2.24 to Table 2.28.

Construction Phase – County Revenues: County revenues come from the portion of General Excise Tax (GET) on construction costs returned to the City and County of Honolulu for transit development and operations.

Operational Phase – Government Costs: For both State and County governments, operational costs are service costs for transient populations (i.e., hotel visitors and the increment in part-time residents from the Future Baseline Condition to each TOD Alternative), as well as possible additional operating costs to serve additional residential population supported.

Operational Phase – State Revenues: Total State tax revenues were already determined as a by-product of the "Islandwide Operational Impact" assessment. These came from summing up the various construction component revenues from the I-O Model State Tax multipliers specified in foregoing Table 2.30 and Table 2.31.

Operational Phase – County Revenues: County revenues are calculated as two alternative bottom lines. The first is the sum of –

- County share of GET from incremental expenditures of transient populations; and
- Property tax (building component only) for three hotels.

An additional possible source of County revenues is the City and County of Honolulu's share of the Transient Accommodations Tax (TAT) for the three hotels.[20] Until recently, 44.8% of all TAT revenues were divided among the four counties, with the City and County of Honolulu receiving 44.1% of that 44.8%. However, the Legislature has capped the total county share (at $93 million as of the 2013 Legislature's action signed into law as Act 161). This means that any additional TAT generated in the near term would yield no additional tax revenues for the City and County.

However, the hotels envisioned for Kaka'ako would not be developed in the short term, but sometime between now and, presumably, 2035. It is possible the cap will be maintained, perhaps at a higher level, indefinitely. However, this course of action may also change if and as expanding tourism places more demands on counties for services and new infrastructures. Therefore, purely for illustrative purposes, a second County Revenue bottom line is calculated that includes the TAT revenue that would be generated if the previous formula is reinstated.

2.8.3 Types of Costs and Revenues Excluded from This Analysis

Note should be made of two exclusions:

[20] Note that State TAT receipts would be included among all other State taxes bundled into the I-O Model's State Tax multipliers.

1. *Property tax revenues from assessed land value component* – As a conservative step, it is assumed that urban properties for hotel use are already zoned for some high-intensity use, such that this property tax component would be unchanged from the Future Baseline Condition to either TOD Alternative. (Property tax rates on land are currently an identical $12.40 per $1,000 assessed value for "Commercial," "Industrial," and "Hotel/Resort" categories.)

2. *Total State or County service costs <u>or</u> revenues associated with islandwide full-time resident population created or maintained by changes in employment* – Although it is an open question whether governments can always achieve the same total overall level of service as population grows, both State and County governments usually are able to achieve fairly balanced budgets. That is, revenues collected from the overall population tend all to be expended on that population.

   Thus, revenues and service costs roughly cancel out and may be excluded from the analysis. (These are different from service costs for transient populations, where there is not such an inherent equilibrium. Additionally, the resident population impacts are not necessarily new bodies on-island – they may be "maintained" rather than "created" – but visitors and part-time residents are assumed always to be new transient population.)

   However, as a conservative step in the analysis, we do include such increases in islandwide operating and facility construction costs as reported only by the key agencies specified in the foregoing Section 2.5 on Public Facilities and Services. This is done to guard against the possibility that it is too facile to assume an automatic equilibrium of full-time resident costs and revenues, and/or to serve as a marker for possible decreases in overall level of services as population increases.

2.8.4 Explanation of Specific Inputs and Multipliers Added for This Analysis

The following additional variables and values are added at this stage of analysis:

1. *Hotel Site Building Values* – Though property tax assessments ultimately reflect market values as determined by sales, initial assessed values are usually based on the value of construction, and so those values are used here.

2. *Property Tax Rates for Hotel Buildings* – As per current Honolulu rates for both land and buildings, a rate of $12.40 per $1,000 value is employed.

3. *O'ahu Share of GET* – 0.5%, applied to direct and total output (portions occurring on O'ahu – a calculation requiring use of DBEDT's County I-O Model), except for the portion applied to expenditures for lodging (see below).

4. *Effective O'ahu TAT and GET Rates for Accommodations Expenditures* – For the alternative illustrious analysis of County revenues from the TAT under the old system, the previously-mentioned percentages of 44.1% and 44.8% must be

multiplied by the TAT tax rate. While the current TAT is specified in law as 9.25%, that 9.25% applies to the pre-tax or "net" billing. The TAT portion of the final "gross" billing (i.e., including both GET and TAT) work out in practice to ***8.1167%.*** The product of these three percentages is 1.6036% of the total gross expenditures for accommodations (an expenditure figure previously generated during analysis of "Islandwide Operational Impacts").

Total GET is nominally 4.5%, of which 4.0% goes to the State and 0.5% (or 1/9 of 4.5%) to the City and County. However, because GET by State law is applied to the gross billing, hoteliers and other retailers typically attach a 4.716% figure to the pre-tax net billing. This leads to an effective GET rate returned to the City and County of ***0.4594%.*** Calculation of the foregoing 8.1167% and 0.4594% figures is explained in Table 2.32.

Table 2.32: Calculating Effective TAT and GET Rates for Lodging Bills

	Tax Rate Applied to Pre-Tax Net Billing	Dollar Amounts	Effective Tax Rate on Final Gross Bill
Example Pre-Tax Billing		$100.00	
TAT Added to Bill	9.2500%	$9.25	8.1167%
Total GET Added to Bill	4.7120%	$4.71	4.1347%
Final Gross Bill		$113.96	
O'ahu Share of GET (1/9)	*0.5236%*		*0.4594%*

Source: Computations by JMK Associates, following consultations with Hawai'i Hotel & Lodging Association

5. *State Per-Capita Service Costs for Transient Populations* – an estimated figure of $1,518.44 annually was generated by the following procedure:

   - Utilize operating costs for broad categories of the State budget available in the *Hawai'i State Data Book 2011* (Table 9.22) for the ten fiscal years from 2003 to 2012, in order to avoid depending on budget figures from any one year (as these may be affected by particular economic circumstances).
   - Determine budget categories for services required largely or entirely by residents only (e.g., Welfare payments), versus those required for both residents and transients.[21]
   - Convert to standard 2012 dollars using the Honolulu Consumer Price Index.
   - For each year, divide the sum of outlays for all services required by both visitors and residents by the sum of resident and average daily visitor population. Take the average for the ten-year period.

[21] State services assumed to be for transients as well as residents were: Public Safety, Highways, Conservation of Natural Resources, Health, Culture and Recreation, and Debt Service. On average, these have accounted for about 27% of State operating expenses each for FY 2003 to 2012.

6. *County Per-Capita Service Costs for Transient Populations* – an estimated figure of $945.19 annually was generated by the following and very similar procedure:

   - Utilize operating costs for broad categories of the City/County *Proposed Operating Program and Budget*[22] for the ten fiscal years from 2003 to 2012.
   - Determine budget categories for services required largely or entirely by residents only (e.g., Human Services), versus those required for both residents and transients.[23]
   - Convert to standard 2012 dollars using the Honolulu Consumer Price Index.
   - For each year, divide the sum of outlays for all services required by both visitors and residents by the sum of resident and average daily visitor population. Take the average for the ten-year period.

2.8.5 Final Calculation Procedures

Construction (Cumulative):

1. State Revenues taken from previous analysis of islandwide construction impacts.
2. Multiply State service cost of $1,406 times off-island construction job-years.
3. Add previously calculated islandwide State facility/infrastructure cost for final cost figure.
4. County revenues calculated as 0.5% GET times total output from previous analysis.
5. Multiply County service cost of $968.50 times off-island construction job-years.
6. Add previously calculated County facility/infrastructure cost for final cost figure.
7. Compare costs and revenues for each level of government.

Operations (Annual):

1. State Revenues taken from previous analysis of islandwide operational impacts.
2. Multiply State service cost of $1,406 times increments in visitors, part-time residents.
3. County revenues begin with 0.5% GET times total output from previous analysis.
4. Add hotel building costs times $12.40 rate for initial County revenue estimate.
5. For second County revenue total, also add TAT rate of 1.6036% times total accommodations expenditures from previous analysis.
6. Multiply County service cost of $968.50 times increments in visitors, part-time residents.
7. Compare costs and revenues for each level of government.

[22] Various documents available at http://www1.honolulu.gov/budget/execbgt/index1.htm.

[23] County services assumed to be for transients as well as residents were: Public Safety, Highways and Streets, Sanitation, Culture-Recreation, and Debt Service. On average, these have accounted for about 59% of State operating expenses each for FY 2003 to 2012. The relatively greater burden imposed by transient populations on the City and County was a factor in the decision to show County revenues from the TAT under the old system, as tourism pressures on counties will presumably motivate continued political efforts to remove or alter the current cap on TAT revenues shared with counties.

3. RESULTS: KAKA'AKO-SPECIFIC LAND USE AREAS AND UNITS

The results reported in this chapter – residential units, visitor units (TOD Alternatives only), and square footage for various land uses – are initial figures used by other consultants and by JMK Associates for our own subsequent population and employment impact assessments.

3.1 Methods and Caveats

The typical presentation style for EIS economic analysis is to provide tables that show at least some of the calculations, with various assumptions and multipliers referenced in footnotes. Because of the complexity of the datasets used for Kaka'ako-specific results in this Chapter 3 through Chapter 6, that is not possible.

This is why methods used to determine the following results were described in detail in the foregoing Chapter 2 – and for these particular results, Section 2.1 of that chapter. In that Section 2.1, Figure 2.2 provides the block numbering system referenced in output tables here.

Results depend on the assumption that the underlying inputs from the HCDA Synoptic Survey output, along with inputs from VIA and HCDA, comprise a fairly accurate inventory of Existing structures and uses in Kaka'ako – and also that the Future Baseline Condition and the two TOD Alternative (A and B) datasets from the same sources provide reasonable illustrative scenarios for the future under the current and proposed new Rules.

3.2 Results – Existing Scenario

These "Existing" results ultimately do not generally affect the impact assessment – which is based on a comparison of Future Baseline Condition each respective TOD Alternative (A and B) results – but they do provide a baseline for understanding levels of development anticipated under each future scenario.

Table 3.1 provides Kaka'ako-wide results, as well as breakdowns by general area (Mauka, Makai, Aloha Tower Special District Site) and specific Neighborhood Zones for the Mauka area. As per discussion in Section 2.2.5, the number of residential units in the Existing dataset (8,618 units, derived primarily from the HCDA Synoptic Survey output) is considerably higher than that reported by the U.S. Census.

Table 3.1: Residential Unit and Land Use Square Footage – Existing Scenario

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM*	Community Center*	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**8,618**	**-**	**8,528,716**	**-**	**1,937,305**	**4,889,491**	**1,801,665**	**1,464,294**	**544,838**	**43,198**	**1,370,820**	**6,440,575**
By General Area												
Mauka	8,618	-	8,528,716	-	1,934,070	4,493,436	1,663,324	1,247,390	-	-	1,370,820	5,793,690
Makai	-	-	-	-	3,235	396,055	138,341	139,304	544,838	43,198	-	646,885
Aloha Tower Special District (ATSD)	-	-	-	-	-	-	-	77,600	-	-	-	-
By Neighborhood Zone												
Pauahi N.Z.	1,241	-	1,222,140	-	63,090	1,621,760	506,420	416,080	-	-	559,070	633,000
Auahi N.Z.	3,002	-	3,003,930	-	-	406,440	711,560	3,540	-	-	367,070	1,624,980
Central Kaka'ako N.Z.	744	-	690,576	-	242,020	835,406	117,574	674,310	-	-	110,750	587,790
Civic Center N.Z.	185	-	184,410	-	449,980	287,110	14,320	6,650	-	-	42,540	693,670
Kapi'olani N.Z.	2,468	-	2,446,570	-	54,480	1,241,730	234,960	30,700	-	-	287,400	1,346,980
Sheridan N.Z.	433	-	427,270	-	73,870	35,110	6,480	-	-	-	3,990	43,990
Thomas Sq. District N.Z.	545	-	553,820	-	1,050,530	65,880	72,010	116,110	-	-	-	863,280
Makai N.Z.	-	-	-	-	3,235	396,055	138,341	139,304	544,838	43,198	-	646,885
ATSD N.Z.	-	-	-	-	-	-	-	77,600	-	-	-	-

* JABSOM is the John A. Burns School of Medicine (University of Hawai'i), and the Community Center (Children's Discovery Center) – kept as distinct uses for purposes of traffic analysis based on this output. In some later analyses, they are collapsed into the "Civic" category.

Columns for Hotel Units and SF are inserted to maintain comparability with the later Table 3.3 and Table 3.4, which include this information for TOD Alternatives B and A, respectively.

3.3 Results – Future Baseline Condition

Table 3.2 provides overall results for the Future Baseline Condition. Comparison to the "Existing" figures in the foregoing Table 3.1 indicates the level of development for likely build-out of Kaka'ako under current Rules – substantial increases in Residential (square footage at 235%, more than tripling, though larger unit sizes resulting in 145% increase in unit count) and Retail (more than doubling at 115%), and significant increase as well in Office (about 67%) and Industrial (about 23%), though with a modest decline in Civic space (about -15%).

Parking is anticipated to involve a consolidation into Garage Parking, leaving very little Surface Parking.

Under the Future Baseline Condition, about half the total square footage listed in Table 3.2 would, if built out, be located in the Pauahi (28%) and Auahi (21%) Neighborhood Zones – where the dominant landowners of Howard Hughes and Kamehameha Schools have master-planned their holdings. More than half the potential total Residential units would be in the same two areas (29% Pauahi and 27% Auahi).

3.4 Results – TOD Alternatives

Table 3.3 provides overall results for TOD Alternative B, and Table 3.4 provides the same for the higher-density Alternative A. Both involve even more Residential development than the Future Baseline Condition, but less for most other uses, as detailed further in the following discussion of "Impacts."

The geographical *proportionate* distribution (i.e., percentage of totals) would change only slightly from build-out under the Future Baseline Condition, mostly by increasing the Pauahi Neighborhood Zone percentages a bit. For TOD Alternative B, the numbers in Table 3.3 indicate that, 30% of total square footage would be in Pauahi and 19% in Auahi – for Residential units, 32% and 22%, respectively. For TOD Alternative B, the numbers in Table 3.4 work out to 31% of total square footage in Pauahi and 21% in Auahi – for Residential units, 32% and 24%, respectively.

Table 3.2: Residential Unit and Land Use Square Footage – Future Baseline Condition

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM	Community Center	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**21,146**	**-**	**28,577,594**	**-**	**1,637,865**	**8,180,851**	**3,872,329**	**1,796,050**	**544,838**	**43,198**	**15,390**	**18,496,225**
By General Area												
Mauka	21,146	-	28,577,594	-	1,211,170	7,038,660	3,449,213	1,692,550	-	-	15,390	16,531,560
Makai	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
Aloha Tower Special District (ATSD)	-	-	-	-	-	30,000	120,000	-	-	-	-	204,000
By Neighborhood Zone												
Pauahi N.Z.	6,086	-	9,000,867	-	947	2,298,229	980,802	486,277	-	-	-	4,889,420
Auahi N.Z.	5,709	-	7,509,664	-	-	854,984	963,961	294,766	-	-	-	3,587,005
Central Kaka'ako N.Z.	1,937	-	2,687,136	-	234,741	972,069	173,887	833,138	-	-	-	1,727,148
Civic Center N.Z.	688	-	1,038,377	-	405,526	118,792	134,797	6,650	-	-	15,390	782,354
Kapi'olani N.Z.	4,176	-	4,415,873	-	54,500	1,166,257	530,983	71,720	-	-	-	2,774,331
Sheridan N.Z.	436	-	724,495	-	73,871	39,561	10,078	-	-	-	-	175,257
Thomas Sq. District N.Z.	2,114	-	3,201,183	-	441,585	1,588,768	654,705	-	-	-	-	2,596,045
Makai N.Z.	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
ATSD N.Z.	-	-	-	-	-	30,000	120,000	-	-	-	-	204,000

Table 3.3: Residential Unit and Land Use Square Footage – TOD Alternative B

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM	Community Center	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**26,588**	**1,044**	**37,639,258**	**547,949**	**1,766,348**	**6,484,283**	**3,369,026**	**1,709,565**	**544,838**	**43,198**	**15,390**	**20,064,395**
By General Area												
Mauka	26,386	672	37,302,490	372,949	1,339,653	5,091,292	3,004,270	1,606,065	-	-	15,390	17,743,460
Makai	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
Aloha Tower Special District (ATSD)	202	372	336,768	175,000	-	280,800	61,640	-	-	-	-	560,270
By Neighborhood Zone												
Pauahi N.Z.	8,470	-	12,828,493	-	947	1,902,790	997,811	552,245	-	-	-	5,685,348
Auahi N.Z.	5,871	317	7,778,799	168,949	-	854,984	963,961	294,766	-	-	-	3,636,478
Central Kaka'ako N.Z.	2,685	-	3,932,045	-	234,741	638,184	185,092	680,684	-	-	-	2,222,927
Civic Center N.Z.	688	-	1,038,377	-	405,526	118,792	134,797	6,650	-	-	15,390	782,354
Kapi'olani N.Z.	5,067	-	5,899,538	-	41,898	1,209,260	352,932	71,720	-	-	-	3,043,004
Sheridan N.Z.	436	-	724,495	-	73,871	39,561	10,078	-	-	-	-	175,257
Thomas Sq. District N.Z.	3,170	356	5,100,744	204,000	582,670	327,721	359,598	-	-	-	-	2,198,092
Makai N.Z.	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
ATSD N.Z.	202	372	336,768	175,000	-	280,800	61,640	-	-	-	-	560,270

Table 3.4: Residential Unit and Land Use Square Footage – TOD Alternative A

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM	Community Center	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**28,968**	**1,000**	**41,093,384**	**482,735**	**1,766,348**	**6,687,334**	**3,635,706**	**1,730,780**	**544,838**	**43,198**	**15,390**	**20,916,071**
By General Area												
Mauka	28,765	628	40,756,616	307,735	1,339,653	5,294,343	3,270,950	1,627,280	-	-	15,390	18,595,136
Makai	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
Aloha Tower Special District (ATSD)	202	372	336,768	175,000	-	280,800	61,640	-	-	-	-	560,270
By Neighborhood Zone												
Pauahi N.Z.	9,218	-	13,702,995	-	947	2,112,188	1,145,280	573,460	-	-	-	6,050,432
Auahi N.Z.	7,094	195	9,815,417	103,735	-	854,984	963,961	294,766	-	-	-	4,010,858
Central Kaka'ako N.Z.	2,685	-	3,932,045	-	234,741	638,184	185,092	680,684	-	-	-	2,222,927
Civic Center N.Z.	688	-	1,038,377	-	405,526	118,792	134,797	6,650	-	-	15,390	782,354
Kapi'olani N.Z.	5,067	-	5,899,538	-	41,898	1,209,260	352,932	71,720	-	-	-	3,043,004
Sheridan N.Z.	436	-	724,495	-	73,871	39,561	10,078	-	-	-	-	175,257
Thomas Sq. District N.Z.	3,578	434	5,643,749	204,000	582,670	321,374	478,810	-	-	-	-	2,310,304
Makai N.Z.	-	-	-	-	426,695	1,112,191	303,116	103,500	544,838	43,198	-	1,760,665
ATSD N.Z.	202	372	336,768	175,000	-	280,800	61,640	-	-	-	-	560,270

3.5 Results – Impacts

Impacts are defined as the difference between the respective TOD Alternative figures and the Future Baseline figures (i.e., TOD Alternative B minus Future Baseline and TOD Alternative A minus Future Baseline). Table 3.5 and Table 3.6 provide these results.

On a Kaka'ako-wide basis, the TOD Alternatives would generate these impacts:

- At build-out, ***substantial increases in Residential square footage and units*** (for Alternative B, 26% more units and 32% more square footage than under the Future Baseline – and for Alternative A, 37% and 44% more). There would also be increases over the Future Baseline for Garage Parking space (9% for Alternative B, 13% for Alternative A), and for Civic (about 8% for each). And of course there would be limited new Hotel development under each of the TOD Alternatives.

- However, the TOD Alternatives both result in ***reduction in Office, Retail, and Industrial space*** compared to build-out for the Future Baseline Condition. The Office and Industrial reductions are roughly -20% and -4% for each TOD Alternative. The build-out scenario generated for Alternative B resulted in a somewhat greater drop in eventual Retail square footage for Alternative B (-13%) than for Alternative A (-6%).

  Note that these negative percentages involve comparison to the Future Baseline figures, not to the Existing figures. Development of all these land uses is still foreseen as significant additions to the current inventory of Office, Retail, and Industrial activities, just not to the same extent as under the Future Baseline Condition.

- Particularly in regard to Residential increases for the higher-density TOD Alternative A, the Neighborhood Zones with the greatest changes in absolute numbers of additional total units would be, starting with the most heavily affected: Pauahi, Thomas Square District, Auahi, Kapi'olani, and Central Kaka'ako.

  The order is similar for the lower-density TOD Alternative B scenario, except that the Auahi Neighborhood Zone in this scenario would have much less (but still some) additional Residential-unit development.

- Unaffected by either TOD Alternative would be the limited Residential development projected under the Future Baseline Condition for the Civic Center Neighborhood Zone, the Sheridan Neighborhood Zone, and still zero Residential development for all of Makai (exclusive of the Aloha Tower Site, which is seen as shifting to a Residential and additional Retail emphasis).

Table 3.5: Residential Unit and Land Use Square Footage – TOD Alternative B Impacts
(Alternative B Results Minus Future Baseline Results)

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	ABSOM	Community Center	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**5,443**	**1,044**	**9,061,664**	**547,949**	**128,483**	**(1,696,568)**	**(503,304)**	**(86,485)**	-	-	-	**1,568,171**
% Increase, TOD Alternative B over Future Baseline	25.7%	N/A	31.7%	N/A	7.8%	(20.7%)	(13.0%)	(4.8%)	0.0%	0.0%	0.0%	8.5%
By General Area												
Mauka	5,240	672	8,724,896	372,949	128,483	(1,947,368)	(444,944)	(86,485)	-	-	-	1,211,901
Makai	-	-	-	-	-	-	-	-	-	-	-	-
Aloha Tower Special District (ATSD)	202	372	336,768	175,000	-	250,800	(58,360)	-	-	-	-	356,270
By Neighborhood Zone												
Pauahi N.Z.	2,384	-	3,827,627	-	-	(395,439)	17,009	65,969	-	-	-	795,928
Auahi N.Z.	162	317	269,135	168,949	-	-	-	-	-	-	-	49,473
Central Kaka'ako N.Z.	748	-	1,244,909	-	-	(333,885)	11,205	(152,454)	-	-	-	495,779
Civic Center N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
Kapi'olani N.Z.	891	-	1,483,665	-	(12,602)	43,003	(178,051)	-	-	-	-	268,673
Sheridan N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
Thomas Sq. District N.Z.	1,055	356	1,899,561	204,000	141,085	(1,261,047)	(295,107)	-	-	-	-	(397,953)
Makai N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
ATSD N.Z.	202	372	336,768	175,000	-	250,800	(58,360)	-	-	-	-	356,270

Note: Figures in parentheses are negatives.

Table 3.6: Residential Unit and Land Use Square Footage – TOD Alternative A Impacts
(Alternative A Results Minus Future Baseline Results)

	Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	JABSOM	Community Center	Surface Parking SF	Garage Parking SF
KAKA'AKO TOTAL	**7,822**	**1,000**	**12,515,790**	**482,735**	**128,483**	**(1,493,517)**	**(236,623)**	**(65,270)**	**-**	**-**	**-**	**2,419,846**
% Increase, TOD Alternative A over Future Baseline	37.0%	N/A	43.8%	N/A	7.8%	(18.3%)	(6.1%)	(3.6%)	0.0%	0.0%	0.0%	13.1%
By General Area												
Mauka	7,620	628	12,179,022	307,735	128,483	(1,744,317)	(178,263)	(65,270)	-	-	-	2,063,576
Makai	-	-	-	-	-	-	-	-	-	-	-	-
Aloha Tower Special District (ATSD)	202	372	336,768	175,000	-	250,800	(58,360)	-	-	-	-	356,270
By Neighborhood Zone												
Pauahi N.Z.	3,132	-	4,702,129	-	-	(186,041)	164,478	87,184	-	-	-	1,161,012
Auahi N.Z.	1,385	195	2,305,753	103,735	-	-	-	-	-	-	-	423,853
Central Kaka'ako N.Z.	748	-	1,244,909	-	-	(333,885)	11,205	(152,454)	-	-	-	495,779
Civic Center N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
Kapi'olani N.Z.	891	-	1,483,665	-	(12,602)	43,003	(178,051)	-	-	-	-	268,673
Sheridan N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
Thomas Sq. District N.Z.	1,464	434	2,442,566	204,000	141,085	(1,267,394)	(175,895)	-	-	-	-	(285,741)
Makai N.Z.	-	-	-	-	-	-	-	-	-	-	-	-
ATSD N.Z.	202	372	336,768	175,000	-	250,800	(58,360)	-	-	-	-	356,270

Note: Figures in parentheses are negatives.

4. RESULTS: KAKA'AKO-SPECIFIC POPULATION

This chapter reports on results for several types of Kaka'ako-specific[24] populations –

- Full-time residential population; and
- "De facto" population – the number of residents or visitors actually present on an average day[25] – which has three components:
  - Full-time residents actually present (excluding people temporarily away);
  - Average part-time resident population;
  - Average visitor population in three presumed hotels.

4.1 Methods and Caveats

Methods used to determine the following results are described in detail in the foregoing Section 2.2. It should be understood that the Future Baseline and TOD Alternative (A or B) population figures are order-of-magnitude estimates for a full build-out under each scenario, whether that actually occurs in the year 2035 or sometime thereafter. Actual population will vary according to specific developer plans, and these numbers should be viewed as approximate maximal numbers.

4.2 Results – Existing Scenario

As with estimated land use and unit counts (Chapter 3), these "Existing" results ultimately do not affect the impact assessment – which is based on a comparison of Future Baseline and TOD Alternative results – but provide a baseline for understanding levels of development anticipated under each of the three future scenarios.

Table 4.1 provides Kaka'ako-wide results, as well as breakdowns by general area (Mauka, Makai, Aloha Tower Special District Site) and specific Neighborhoods for the Mauka area. As was discussed in Section 2.2.5, the HCDA Synoptic Survey output) is considerably higher than that reported by the U.S. Census. Therefore, Table 4.1's estimated "existing" full-time resident population of 13,549 – based primarily on the HCDA unit counts – is also higher than the 2010 Census figure (10,673).

[24] As noted in Chapter 1, Section 1.6, islandwide population impacts are conceptually different, and are addressed in the following Chapter 8.
[25] A different interpretation of "de facto population" might include workers and retail/restaurant customers present at any particular point in time. Estimating customer counts exceeds the scope of this study. The following Chapter 5 looks at total jobcounts, but not necessarily the number present at particular points in time. Caution should be taken in simply adding population and jobcount numbers, due to factors such as employee absences and the possibility that some Kaka'ako workers are also Kaka'ako residents.

Table 4.1: Estimated Population – Existing Scenario

	Total Full-Time Residential Population	Total De Facto Population	*De Facto Resident Population*	*De Facto Part-Time Resident Population*	*De Facto Visitor Population*
KAKA'AKO TOTAL	**13,549**	**13,824**	***12,804***	***1,020***	**-**
By General Area					
Mauka	13,326	13,613	*12,593*	*1,020*	-
Makai	223	211	*211*	-	-
ATSD (Aloha Tower Special District)	-	-	-	-	-
By Neighborhood Zone					
Pauahi N.Z.	1,912	1,865	*1,807*	*58*	-
Auahi N.Z.	3,796	4,364	*3,587*	*777*	-
Central Kaka'ako N.Z.	1,522	1,464	*1,438*	*25*	-
Civic Center N.Z.	209	197	*197*	*0*	-
Kapi'olani N.Z.	4,206	4,112	*3,975*	*137*	-
Sheridan N.Z.	863	819	*816*	*3*	-
Thomas Sq. Dist. N.Z.	818	793	*773*	*20*	-
Makai N.Z.	223	211	*211*	-	-
ATSD N.Z.	-	-	-	-	-

Notes: The Makai population, taken from the 2010 Census, consists solely of the non-residential Kewalo Basin population, who may have been transients or passenger/crew of cruising vessels temporarily in port. However, this number is assumed to hold constant in all scenarios. This was the only population number taken directly from the U.S. Census, though the Census data were used to estimate things such as average household size for various building types and places within Kaka'ako, which were then applied to unit numbers in Table 3.1 in order to estimate the population figures above.

The Aloha Tower Special District site currently consists of a HECO power generation facility (now on standby basis) with no residential population of any type.

A column for "De Facto Visitor Population" (hotel guests) is inserted to maintain comparability with the later Table 4.3 and Table 4.4, which include this information for TOD Alternatives B and A, respectively.

4.3 Results – Future Baseline Condition

Table 4.2 shows population results for the Future Baseline Condition. Comparison to the comparable "Existing" figures in the foregoing Table 4.1 indicates both full-time and de facto populations would more than double (to about 33,500 for full-time, a bit more for de facto), consistent with the increased number of units estimated in Section 3.3. This projected population increase flows directly from increase in units under current Rules.

Consistent with the geographical distribution of Residential units (Section 3.3), the numbers in Table 4.2 indicate that theoretical full-time population for build-out of the Future Baseline Condition would be primarily concentrated in the Pauahi Neighborhood Zone (31%), as well as the Auahi (22%) and Kapi'olani (21%) zones.

4.4 Results – TOD Alternatives

Consistent with the increased Residential space discussed previously in Section 3.4, ***both TOD Alternatives result in more population at build-out than under the Future Baseline Condition.***

Overall results are in Table 4.3 (TOD Alternative B) and Table 4.4 (Alternative A). For Alternative B, full-time residential and overall de facto populations are estimated at about 42,500 and 44,500 respectively. The higher-density Alternative A, the build-out numbers increase to about 46,200 and 48,200 respectively.

An average daily visitor population of roughly 1,700 people in each scenario would be spread among three assumed hotels (and thus represents just a small part of the estimated overall de facto populations).

Compared to the percentages for the Future Baseline Condition noted above, the *proportionate* geographical distribution of full-time residential population would again change only slightly, with a few more percentage points in the Pauahi Neighborhood Zone (about 34% for each TOD Alternative) and a few less in the Auahi (18% for TOD Alternative B and 20% for Alternative B) and Kapi'olani (20% for Alternative B and 19% for Alternative A) zones.

Table 4.2: Estimated Population – Future Baseline Condition

	Total Full-Time Residential Population	Total De Facto Population	*De Facto Resident Population*	*De Facto Part-Time Resident Population*	*De Facto Visitor Population*
KAKA'AKO TOTAL	**33,466**	**33,844**	***31,626***	***2,218***	**-**
By General Area					
Mauka	33,243	33,633	*31,415*	*2,218*	-
Makai	223	211	*211*	-	-
ATSD (Aloha Tower Special District)	-	-	-	-	-
By Neighborhood Zone					
Pauahi N.Z.	10,341	10,131	*9,772*	*358*	-
Auahi N.Z.	7,386	8,429	*6,980*	*1,450*	-
Central Kaka'ako N.Z.	3,354	3,258	*3,169*	*88*	-
Civic Center N.Z.	826	788	*780*	*8*	-
Kapi'olani N.Z.	7,097	6,944	*6,707*	*237*	-
Sheridan N.Z.	824	783	*778*	*4*	-
Thomas Sq. Dist. N.Z.	3,416	3,301	*3,228*	*73*	-
Makai N.Z.	223	211	*211*	-	-
ATSD N.Z.	-	-	-	-	-

Notes: All indicated population is associated with residential housing structures, except for the assumed continuation of Kewalo Basin non-residential population in the Makai area.

No "De Facto Visitor Population" is shown because no short-term transient accommodations (e.g., hotels) are permitted in Kaka'ako under the present Rules.

The Aloha Tower Special District site is assumed under this scenario to be developed as a retail and office complex, with no residential component.

Table 4.3: Estimated Population – TOD Alternative B

	Total Full-Time Residential Population	Total De Facto Population	*De Facto Resident Population*	*De Facto Part-Time Resident Population*	*De Facto Visitor Population*
KAKA'AKO TOTAL	**42,477**	**44,465**	***40,141***	***2,573***	***1,752***
By General Area					
Mauka	41,986	43,482	*39,676*	*2,522*	*1,283*
Makai	223	211	*211*	-	-
ATSD (Aloha Tower Special District)	268	772	*254*	*50*	*469*
By Neighborhood Zone					
Pauahi N.Z.	14,493	14,175	*13,696*	*480*	-
Auahi N.Z.	7,600	9,270	*7,182*	*1,490*	*598*
Central Kaka'ako N.Z.	4,562	4,452	*4,311*	*141*	-
Civic Center N.Z.	826	788	*780*	*8*	-
Kapi'olani N.Z.	8,664	8,476	*8,188*	*288*	-
Sheridan N.Z.	824	783	*778*	*4*	-
Thomas Sq. Dist. N.Z.	5,017	5,537	*4,741*	*111*	*685*
Makai N.Z.	223	211	*211*	-	-
ATSD N.Z.	268	772	*254*	*50*	*469*

Notes: All indicated population is associated with residential housing or transient accommodation structures, except for the assumed continuation of Kewalo Basin non-residential population in the Makai area.

The Aloha Tower Special District site is assumed under this scenario (and under TOD Alternative A) to be even more intensively developed as a retail and office complex, but this time with a substantial residential component.

Table 4.4: Estimated Population – TOD Alternative A

	Total Full-Time Residential Population	Total De Facto Population	*De Facto Resident Population*	*De Facto Part-Time Resident Population*	*De Facto Visitor Population*
KAKA'AKO TOTAL	**46,181**	**48,223**	***43,641***	***2,911***	***1,671***
By General Area					
Mauka	45,690	47,240	*43,177*	*2,861*	*1,202*
Makai	223	211	*211*	-	-
ATSD (Aloha Tower Special District)	268	772	*254*	*50*	*469*
By Neighborhood Zone					
Pauahi N.Z.	15,857	15,486	*14,985*	*501*	-
Auahi N.Z.	9,223	10,877	*8,715*	*1,794*	*367*
Central Kaka'ako N.Z.	4,562	4,452	*4,311*	*141*	-
Civic Center N.Z.	826	788	*780*	*8*	-
Kapi'olani N.Z.	8,664	8,476	*8,188*	*288*	-
Sheridan N.Z.	824	783	*778*	*4*	-
Thomas Sq. Dist. N.Z.	5,734	6,378	*5,419*	*124*	*835*
Makai N.Z.	223	211	*211*	-	-
ATSD N.Z.	268	772	*254*	*50*	*469*

Notes: All indicated population is associated with residential housing or transient accommodation structures, except for the assumed continuation of Kewalo Basin non-residential population in the Makai area.

The Aloha Tower Special District site is assumed under this scenario (and under TOD Alternative B) to be even more intensively developed as a retail and office complex, but this time with a substantial residential component.

4.5 Results – Impacts

Impacts are again defined as the difference between the respective TOD Alternative figures and the Future Baseline figures (i.e., TOD Alternative B minus Future Baseline and TOD Alternative A minus Future Baseline). Table 4.5 and Table 4.6 provide these results.

- At build-out under the TOD Alternative B scenario, the full-time residential and total de facto populations would be respectively 27% and 31% greater than under the Future Baseline Condition (based on current Rules). Under the higher-density Alternative A, they would be 38% and 43%, respectively, greater than under the Future Baseline.

  Again, the population increase primarily reflects the estimated increase in total units shown in Table 3.5 and Table 3.6 of Chapter 3. The estimated population increase percentages are slightly greater than the unit increase percentages (26% for Alternative B and 37% for Alternative A) because of growth in places or building types with slightly higher average household sizes or other parameters (such as vacancy rates). However, these differences in percentage points are quite small.

- Percentage increases in full-time residential population impacts are estimated to outstrip percentage increases in part-time population impact. This is because additional development capacity assumed for both TOD Alternatives (A and B) would occur in many parts of Kaka'ako, whereas substantial numbers of part-time residents are attracted only to certain parts of the area, such as those with ocean views.

- However, the addition of visitor population (hotel guests) under both TOD Alternatives means the combined de facto population impact – including hotel guests, part-time residents, and full-time residents actually present on any given day – is slightly larger than the full-time resident population impact for each of the TOD Alternatives (both A and B).

Table 4.5: Population – TOD Alternative B Impacts
(Alternative B Results Minus Future Baseline Results)

	Total Full-Time Residential Population	Total De Facto Population	De Facto Resident Population	De Facto Part-Time Resident Population	De Facto Visitor Population
KAKA'AKO TOTAL	**9,011**	**10,621**	***8,515***	***354***	***1,752***
% Increase, TOD Alternative B over Future Baseline	26.9%	31.4%	*26.9%*	*16.0%*	*New*
By General Area					
Mauka	8,742	9,849	*8,262*	*304*	*1,283*
Makai	-	-	-	-	-
ATSD (Aloha Tower Special District)	268	772	*254*	*50*	*469*
By Neighborhood Zone					
Pauahi N.Z.	4,152	4,045	*3,923*	*122*	-
Auahi N.Z.	214	841	*203*	*40*	*598*
Central Kaka'ako N.Z.	1,208	1,194	*1,141*	*52*	-
Civic Center N.Z.	-	-	-	-	-
Kapi'olani N.Z.	1,568	1,533	*1,481*	*51*	-
Sheridan N.Z.	-	-	-	-	-
Thomas Sq. Dist. N.Z.	1,601	2,237	*1,513*	*38*	*685*
Makai N.Z.	-	-	-	-	-
ATSD N.Z.	268	772	*254*	*50*	*469*

Table 4.6: Population – TOD Alternative A Impacts
(Alternative A Results Minus Future Baseline Results)

	Total Full-Time Residential Population	Total De Facto Population	De Facto Resident Population	De Facto Part-Time Resident Population	De Facto Visitor Population
KAKA'AKO TOTAL	**12,715**	**14,379**	***12,015***	***693***	***1,671***
% Increase, TOD Alternative A over Future Baseline	38.0%	42.5%	*38.0%*	*31.2%*	*New*
By General Area					
Mauka	12,446	13,606	*11,762*	*642*	*1,202*
Makai	-	-	-	-	-
ATSD (Aloha Tower Special District)	268	772	*254*	*50*	*469*
By Neighborhood Zone					
Pauahi N.Z.	5,516	5,355	*5,213*	*143*	-
Auahi N.Z.	1,837	2,447	*1,736*	*344*	*367*
Central Kaka'ako N.Z.	1,208	1,194	*1,141*	*52*	-
Civic Center N.Z.	-	-	-	-	-
Kapi'olani N.Z.	1,568	1,533	*1,481*	*51*	-
Sheridan N.Z.	-	-	-	-	-
Thomas Sq. Dist. N.Z.	2,318	3,077	*2,191*	*51*	*835*
Makai N.Z.	-	-	-	-	-
ATSD N.Z.	268	772	*254*	*50*	*469*

5. RESULTS: KAKA'AKO-SPECIFIC OPERATIONAL EMPLOYMENT IMPACTS

This chapter is concerned with "operational employment" – i.e., full- and part-time jobcounts associated with the *operation* of public and private economic activities, as opposed to the *construction* of new buildings or infrastructure. (Construction employment is addressed in the following chapter, and includes public facility and infrastructure projects based in part on these operational jobcount estimates, as per later discussion in Chapter 7.)

The tables in this chapter contain results for estimated total jobcounts in Kaka'ako under all scenarios – Existing, Future Baseline, and both TOD Alternatives – derived by first estimating jobcounts for each specific types of land/building use, and then summing.

5.1 Methods and Caveats

Methods used to determine the following results are described in detail in the foregoing Section 2.3. All the cautions described in the past few chapters apply here as well –

- Reliance on inputs from the initial HCDA datasets, as well as VIA and HCDA update assumptions previously described.
- Reminder that the following figures are not precise projections, but rather order-of-magnitude estimates for a full build-out under each scenario, whether that actually occurs in the year 2035 or sometime thereafter.

The first caveat is particularly important here due to the large number of Office jobs that flow from the assumed large amount of Office space in Kaka'ako. As discussed in Chapter 1, Section 1.2, there are serious questions about whether that much Office development will truly materialize in Kaka'ako by the assumed 2035 build-out time – but the analysis is actually one of build-out of the HCDA vision whenever it really occurs.

Finally, "total jobcount" should not be interpreted as a point-in-time estimate of workers actually present in Kaka'ako. Employees work different shifts (day/night, weekday/ weekend), and factors such as vacations and illnesses affect the actual number of workers present at any one time.

5.2 Results – Existing Scenario

"Existing" results provide context for the subsequent impact assessment that involves comparing the two different future scenarios. The following Table 5.1 indicates a Year 2010 total Kaka'ako jobcount of approximately 31,600 – the vast majority located in the Mauka area, and more than 60% due to Office activity.

Table 5.1: Estimated Kaka'ako-Specific Operational Jobcount – Existing Scenario

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	JABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKA'AKO TOTAL	**31,546**	**509**	**-**	**4,920**	**19,558**	**3,603**	**2,351**	**440**	**57**	**107**
By General Area										
Mauka	**28,846**	509	-	4,8304	17,974	3,327	2,079		57	97
Makai	**2,660**	-	-	116	1,584	277	232	440	-	11
Aloha Tower Special District (ATSD)	**40**	-	-	-	-	-	40		-	-
By Neighborhood Zone										
Pauahi N.Z.	**8,406**	52	-	127	6,487	1,013	693	-	23	11
Auahi N.Z.	**3,397**	300	-	-	1,626	1,423	6	-	15	27
Central Kaka'ako N.Z.	**5,348**	28	-	605	3,342	235	1,124	-	5	10
Civic Center N.Z.	**2,331**	5	-	1,125	1,148	29	11	-	2	12
Kapi'olani N.Z.	**5,758**	100	-	136	4,967	470	51	-	12	22
Sheridan N.Z.	**350**	11	-	185	140	13	-	-	0	1
Thomas Sq. District N.Z.	**3,255**	14	-	2,626	264	144	194	-	-	14
Makai N.Z.	**2,660**	-	-	116	1,584	277	232	440	-	11
ATSD N.Z.	**40**	-	-	-	-	-	40	-	-	-

Notes: For purposes of this analysis, the "Community Center" (Children's Discovery Center) has been combined with "Civic" in this and subsequent tables.

A column for "Hotel Jobs" is inserted to maintain comparability with the later Table 5.3 and Table 5.4, which include this information for the two TOD Alternatives (A and B).

5.3 Results – Future Baseline Condition

Under the Future Baseline Condition (i.e., under current Rules), Table 5.2 contains estimates that sum to a Kaka'ako-wide total jobcount of about 51,200 full- and part-time jobs – about a 62% increase over the estimated Existing total in Table 5.1.

Note, however, that the vast majority of this employment growth is in the Office category (reflecting assumed growth in Office space), which would comprise about 73% of the operational jobs under this scenario.

Under this Future Baseline Condition, most jobs still remain in the Mauka area, but Makai jobs increase as a proportion of the total, though again primarily due to assumed development of substantial Office space.

At the level of Neighborhood Zones, the distribution of jobs at build-out in Table 5.2 is relatively more even across areas than was the distribution of population for the Future Baseline Condition (discussed previously in Section 4.3). However, the Pauahi Neighborhood Zone still would have the single largest share (25%), followed by the Thomas Square District zone (18%). Numbers in the table equate to 12% to 14% for each of these Neighborhood Zones: Auahi, Central Kaka'ako, Kapi'olani, and Makai (exclusive of the Aloha Tower Special District, or ATSD). Jobs in all these Neighborhood Zones, however, are dominated by the "Office" category, which has in reality been a very slow-growing category.

Table 5.2: Estimated Kaka'ako-Specific Operational Jobcount – Future Baseline Condition

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	UABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKA'AKO TOTAL	**51,207**	**946**	**-**	**3,461**	**37,186**	**6,358**	**2,509**	**490**	**1**	**256**
By General Area										
Mauka	**43,691**	946	-	2,494	31,994	5,663	2,365		1	229
Makai	**7,180**	-	-	967	5,055	498	145	490	-	24
Aloha Tower Special District (ATSD)	**336**	-	-	-	136	197	-		-	3
By Neighborhood Zone										
Pauahi N.Z.	**13,039**	233	-	2	10,446	1,610	679	-	-	68
Auahi N.Z.	**6,399**	468	-	-	3,886	1,583	412	-	-	50
Central Kaka'ako N.Z.	**6,438**	62	-	483	4,418	286	1,164	-	-	24
Civic Center N.Z.	**1,631**	14	-	835	540	221	9	-	1	11
Kapi'olani N.Z.	**6,540**	117	-	112	5,301	872	100	-	-	38
Sheridan N.Z.	**360**	9	-	152	180	17	-	-	-	2
Thomas Sq. District N.Z.	**9,285**	43	-	909	7,222	1,075	-	-	-	36
Makai N.Z.	**7,180**	-	-	967	5,055	498	145	490	-	24
ATSD N.Z.	**336**	-	-	-	136	197	-	-	-	3

5.4 Results – TOD Alternatives

Consistent with the decreased Office, Retail, and Industrial space discussed previously in Section 3.4, ***both TOD Alternatives result in fewer jobs at build-out than under the Future Baseline Condition.*** That is, the fundamental nature of either one of the TOD Alternatives, A or B is a relative switch in emphasis from commercial activity to residential development.

The theoretical ultimate total jobcount remains a little higher for TOD Alternative A (about 45,160 in Table 5.4) than for Alternative B (about 43,650 in Table 5.3). Office jobs also drop from the Future Baseline Condition level for TOD Alternative A, and even more for Alternative B, but still comprise more than two-thirds of the total jobcount under each scenario.

The projected reduction (compared to the Future Baseline) in jobs is all in the Mauka area, as the Makai jobcounts – exclusive of the ATSD – in both Table 5.3 and Table 5.4 are identical to the Future Baseline jobcount number in Table 5.2 (7,180). However, the number of jobs associated with the ATSD site is larger for each TOD Alternative (about 1,650) than under the Future Baseline Condition, reflecting assumed additional development capacity there.[26]

The *proportionate* geographic distribution of jobs, compared to the Future Baseline Condition percentages discussed above, shows more change than did population distribution (Section 5.4) – mostly a sharp reduction in potential future jobs in the Thomas Square District Neighborhood Zone (down to 8% in both TOD Alternatives) due to Office jobs declining more than anywhere else. However, as with population, the Pauahi zone gains some percentage points (up to 26% for Alternative B and 28% for Alternative A), as does the Auahi zone (up to 15% for each TOD Alternative). The Makai and ATSD zones also increase a few points proportionately. The reality of these shifts once more depends not only on landowner action to implement these changes, but also on a substantial increase in market demand for Office space.

[26] The ATSD parcel is the site of the current HECO power plant facility. It should be noted that HECO has taken the power plant offline but currently plans to retain it for back-up purposes – *not* to redevelop it as assumed for the Future Baseline and TOD Overlay scenarios. Again, this study looks at what HCDA envisions and/or would permit under current or proposed Rules; it does not obligate landowners to implement the scenarios described here.

Table 5.3: Estimated Kaka'ako-Specific Operational Jobcount – TOD Alternative B

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	UABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKA'AKO TOTAL	**43,651**	**1,130**	**634**	**3,726**	**29,474**	**5,532**	**2,388**	**490**	**1**	**277**
By General Area										
Mauka	**34,825**	1,113	388	2,758	23,142	4,933	2,244		1	245
Makai	**7,180**	-	-	967	5,055	498	145	490	-	24
Aloha Tower Special District (ATSD)	**1,647**	17	245	-	1,276	101	-		-	8
By Neighborhood Zone										
Pauahi N.Z.	**11,457**	317	-	2	8,649	1,638	772	-	-	79
Auahi N.Z.	**6,595**	481	183	-	3,886	1,583	412	-	-	50
Central Kaka'ako N.Z.	**4,761**	92	-	483	2,901	304	951	-	-	31
Civic Center N.Z.	**1,631**	14	-	835	540	221	9	-	1	11
Kapi'olani N.Z.	**6,440**	135	-	86	5,497	579	100	-	-	42
Sheridan N.Z.	**360**	9	-	152	180	17	-	-	-	2
Thomas Sq. District N.Z.	**3,581**	65	205	1,200	1,490	590	-	-	-	30
Makai N.Z.	**7,180**	-	-	967	5,055	498	145	490	-	24
ATSD N.Z.	**1,647**	17	245	-	1,276	101	-	-	-	8

Table 5.4: Estimated Kaka'ako-Specific Operational Jobcount – TOD Alternative A

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	JABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKA'AKO TOTAL	**45,157**	**1,259**	**608**	**3,726**	**30,397**	**5,970**	**2,418**	**490**	**1**	**289**
By General Area										
Mauka	**36,330**	1,242	363	2,758	24,065	5,371	2,273		1	257
Makai	**7,180**	-	-	967	5,055	498	145	490	-	24
Aloha Tower Special District (ATSD)	**1,647**	17	245	-	1,276	101	-		-	8
By Neighborhood Zone										
Pauahi N.Z.	**12,706**	338	-	2	9,601	1,880	801	-	-	84
Auahi N.Z.	**6,630**	582	112	-	3,886	1,583	412	-	-	55
Central Kaka'ako N.Z.	**4,761**	92	-	483	2,901	304	951	-	-	31
Civic Center N.Z.	**1,631**	14	-	835	540	221	9	-	1	11
Kapi'olani N.Z.	**6,440**	135	-	86	5,497	579	100	-	-	42
Sheridan N.Z.	**360**	9	-	152	180	17	-	-	-	2
Thomas Sq. District N.Z.	**3,802**	73	250	1,200	1,461	786	-	-	-	32
Makai N.Z.	**7,180**	-	-	967	5,055	498	145	490	-	24
ATSD N.Z.	**1,647**	17	245	-	1,276	101	-	-	-	8

5.5 Results – Impacts

Table 5.5 and Table 5.6 again show "impacts" as the difference between results for each of the TOD Alternatives and results for the Future Baseline Condition results. These reflect the basic overall nature of the difference between either of the TOD Alternatives versus the Future Baseline Condition – i.e., substantially more residential development, somewhat less commercial activity – flowing from the land/building use changes documented in Chapter 3:

- About 12% fewer total Kaka'ako-wide jobs (about 6,050 in absolute number) under TOD Alternative A than under the Future Baseline Condition – and 15% fewer (about 7,560) under Alternative B – with total job reductions greatest in the Thomas Square District and Central Kaka'ako Neighborhood Zones. The density reductions in Alternative B would also result in the loss of more potential jobs in the Pauahi zone.

- A particularly large proportionate reduction (more or less 20% for each TOD Alternative) in Office jobs, accompanied by a proportionately large (33% for TOD Alternative A and 19% for Alternative B) increase in Residential management/ maintenance jobs – though the *absolute* number of projected additional Residential jobs is still relatively low (about 300 for Alternative A and under 200 for Alternative B).

Table 5.5: Kaka'ako-Specific Operational Jobcount – TOD Alternative B Impacts
(Alternative B Results Minus Future Baseline Results)

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	JABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKA'AKO TOTAL	**(7,555)**	**184**	**634**	**265**	**(7,712)**	**(826)**	**(121)**	**-**	**-**	**22**
% Increase, TOD Alternative B over Future Baseline	**(14.8%)**	19.4%	N/A	7.6%	(20.7%)	(13.0%)	(4.8%)	0.0%	0.0%	8.5%
By General Area										
Mauka										
Makai	**(8,866)**	167	388	265	(8,852)	(731)	(121)	-	-	17
Aloha Tower Special District (ATSD)	**-**	-	-	-	-	-	-	-	-	-
	1,311	17	245	-	1,140	(96)	-	-	-	5
By Neighborhood Zone										
Pauahi N.Z.										
Auahi N.Z.	**(1,582)**	85	-	-	(1,797)	28	92	-	-	11
Central Kaka'ako N.Z.	**197**	13	183	-	-	-	-	-	-	1
Civic Center N.Z.	**(1,676)**	29	-	-	(1,518)	18	(213)	-	-	7
Kapi'olani N.Z.	**-**	-	-	-	-	-	-	-	-	-
Sheridan N.Z.	**(101)**	18	-	(26)	195	(292)	-	-	-	4
Thomas Sq. District N.Z.	**-**	-	-	-	-	-	-	-	-	-
Makai N.Z.	**(5,705)**	22	205	290	(5,732)	(485)	-	-	-	(6)
ATSD N.Z.	**-**	-	-	-	-	-	-	-	-	-

Note: Figures in parentheses are negatives.

Table 5.6: Kaka'ako-Specific Operational Jobcount – TOD Alternative A Impacts
(Alternative A Results Minus Future Baseline Results)

	TOTAL	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	JABSOM Jobs	Surface Parking Jobs	Garage Parking Jobs
KAKA'AKO TOTAL	**(6,050)**	**313**	**608**	**265**	**(6,789)**	**(389)**	**(91)**	**-**	**-**	**33**
% Increase, TOD Alternative A over Future Baseline	**(11.8%)**	33.0%	N/A	7.6%	(18.3%)	(6.1%)	(3.6%)	0.0%	0.0%	13.1%
By General Area										
Mauka	**(7,361)**	296	363	265	(7,929)	(293)	(91)	-	-	29
Makai	**-**	-	-	-	-	-	-	-	-	-
Aloha Tower Special District (ATSD)	**1,311**	17	245	-	1,140	(96)	-	-	-	5
By Neighborhood Zone										
Pauahi N.Z.	**(333)**	105	-	-	(846)	270	122	-	-	16
Auahi N.Z.	**232**	114	112	-	-	-	-	-	-	6
Central Kaka'ako N.Z.	**(1,676)**	29	-	-	(1,518)	18	(213)	-	-	7
Civic Center N.Z.	**-**	-	-	-	-	-	-	-	-	-
Kapi'olani N.Z.	**(101)**	18	-	(26)	195	(292)	-	-	-	4
Sheridan N.Z.	**-**	-	-	-	-	-	-	-	-	-
Thomas Sq. District N.Z.	**(5,483)**	30	250	290	(5,761)	(289)	-	-	-	(4)
Makai N.Z.	**-**	-	-	-	-	-	-	-	-	-
ATSD N.Z.	**1,311**	17	245	-	1,140	(96)	-	-	-	5

Note: Figures in parentheses are negatives.

6. RESULTS: KAKA'AKO-SPECIFIC CONSTRUCTION EMPLOYMENT IMPACTS

This chapter provides estimates of the *cumulative* Kaka'ako-specific construction-related employment impacts, in terms of "job-years." Results are provided for Future Baseline Condition and the two TOD Alternatives only, as construction has already occurred for "Existing" Kaka'ako structures.

The construction impacts come primarily from development of new buildings – determined by comparing the HCDA Future Baseline dataset (as well as the TOD Alternative datasets that represent adjusted versions of the Future Baseline dataset) to the Existing dataset in order to identify new structures. However, some of the construction activity also comes from development of (a) additional public facilities identified in the following Chapter 7, and (b) additional public infrastructure as identified by project consultants Belt Collins Hawai'i and Nelson\Nygaard (also Chapter 7).

6.1 Methods and Caveats

Construction Related to New Structures: Methods used to determine following results in this chapter are described in detail in the foregoing Section 2.4. All the cautions described in the past few chapters apply here as well. For these construction results, it should be remembered that (a) numbers represent the sum of construction effects assumed to take place over time, but no specific timetable is assumed; and (b) the results describe the cumulative effect of theoretical *full build-outs* for each scenario. The datasets used for the analysis imply the great majority of Kaka'ako structures would be new under these full build-out scenarios (Table 6.1). Whether such full build-outs could occur by 2035 is beyond the scope of this analysis.

Table 6.1: Percentage New Development (in SF) for Both Future Scenarios

	Residen-tial SF	Hotel SF	Civic SF	Office SF	Retail SF	Indus-trial SF	Parking Garage SF
Future Baseline	74.1%	N/A	26.1%	80.1%	87.0%	90.2%	79.2%
TOD Alternative B	80.9%	100.0%	27.5%	75.5%	85.5%	89.8%	81.1%
TOD Alternative A	82.5%	100.0%	27.5%	76.3%	86.6%	89.9%	81.9%

Source: JMK Associates analysis of datasets described in Section 2.1.1.

As one conservative counter-weight to the inherently non-conservative assumption of full build-out, only construction impacts are estimated – implicit demolition is ignored. Also omitted (and difficult to estimate) is infrastructure provided by private landowners.

Construction Related to New Public Facilities and Infrastructure: Except for provision of multipliers, these methods were entirely set forth in the earlier Section 2.4 and/or Section 2.5 (explaining methods for following Chapter 7, which provides facility and infrastructure cost estimates needed to generate construction job figures).

6.2 Results – Future Baseline Condition

Exclusive of whatever jobs may be generated by Makai public infrastructure, Table 6.2 indicates a total of about 55,840 job-years of construction for full build-out of the Future Baseline Condition, more than half associated with residential buildings.

Under the Future Baseline Condition, about 38% of the total construction job-years over time would be located in the Pauahi Neighborhood Zone, 23% in Auahi, and 11% in the Thomas Square District Neighborhood Zone.

6.3 Results – Results – TOD Alternatives

Table 6.3 and Table 6.4 show indicates significantly more estimated job-years of construction for the TOD Alternatives (about 69,200 for Alternative B and 76,200 for the higher-density Alternative A) than under the Future Baseline Condition.

As with the Future Baseline Condition, but to an even greater extent, construction activity and employment is concentrated:

- In development of Residential structures and Parking; and
- Primarily although not completely within the Pauahi (about 40% for both TOD Alternatives) and Auahi (19% for Alternative B and 23% for Alternative A) Neighborhood Zones – i.e., proportionately a little more in Pauahi and, for Alternative B, a little less in Auahi than the Future Baseline Condition figures above. The percentage for the Thomas Square District zone remains the same at 11% for each TOD Alternative.

Table 6.2: Estimated Kaka'ako-Specific Construction Jobcount – Future Baseline Condition

	TOTAL (Job-years)	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	Garage Parking Jobs	Infrastructure and Public Facilities
KAKA'AKO TOTAL	**55,838**	**30,741**	**0**	**1,313**	**8,382**	**3,088**	**739**	**10,481**	**1,093**
By General Area									
Mauka	**50,686**	30,741	0	309	6,954	2,663	739	9,279	0
Makai	**3,693**	0	0	1,004	1,379	293	0	1,016	0
Aloha Tower Special District (ATSD)	**367**	0	0	0	49	131	0	186	0
Unallocated*	**1,093**	**0**	**0**	**0**	0	0	0	0	1,093
By Neighborhood Zone									
Pauahi N.Z.	**21,432**	13,701	0	0	2,736	794	222	3,980	0
Auahi N.Z.	**12,731**	7,892	0	0	1,253	1,031	134	2,422	0
Central Kaka'ako N.Z.	**3,868**	2,057	0	50	706	99	380	576	0
Civic Center N.Z.	**1,195**	804	0	113	8	86	3	181	0
Kapi'olani N.Z.	**4,322**	2,448	0	0	766	229	0	879	0
Sheridan N.Z.	**855**	587	0	146	36	6	0	80	0
Thomas Sq. District N.Z.	**6,281**	3,252	0	0	1,449	418	0	1,162	0
Makai N.Z.	**3,693**	0	0	1,004	1,379	293	0	1,016	0
ATSD N.Z.	**367**	0	0	0	49	131	0	186	0
Unallocated*	**1,093**	0	0	0	0	0	0	0	1,093

* "Unallocated" refers to infrastructure and public facilities, as either exact future locations are unknown or else they may extend through various geographical areas.

Note: Small percentages of these figures consist of jobs generated through "soft costs" (primarily architectural and engineering, see Section 2.4) that would in all likelihood be located outside these specific geographical areas and quite possibly outside Kaka'ako itself. Some of the "Unallocated" infrastructure and public facility direct construction jobs could also be located outside Kaka'ako – e.g., construction of schools or other public facilities serving Kaka'ako but not located in Kaka'ako. Consistent with text discussion, however, public infrastructure jobs related to Makai development (outside the ATSD) are not counted, and so "Unallocated" jobs are most likely to be in the Mauka or ATSD areas.

Table 6.3: Estimated Kaka'ako-Specific Construction Jobcount – TOD Alternative B

	TOTAL (Job-years)	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	Garage Parking Jobs	Infrastructure and Public Facilities
KAKA'AKO TOTAL	**69,220**	**43,702**	**768**	**1,446**	**6,769**	**2,758**	**700**	**11,770**	**1,307**
By General Area									
Mauka	**62,368**	43,112	544	442	4,929	2,398	700	10,243	0
Makai	**3,693**	0	0	1,004	1,379	293	0	1,016	0
Aloha Tower Special District (ATSD)	**1,853**	590	223	0	461	67	0	511	0
Unallocated*	**1,307**	0	0	0	0	0	0	0	1,307
By Neighborhood Zone									
Pauahi N.Z.	**28,261**	20,404	0	0	2,087	812	252	4,706	0
Auahi N.Z.	**13,495**	8,363	247	0	1,253	1,031	134	2,467	0
Central Kaka'ako N.Z.	**4,993**	3,323	0	50	401	106	310	802	0
Civic Center N.Z.	**1,195**	804	0	113	8	86	3	181	0
Kapi'olani N.Z.	**6,055**	4,072	0	0	846	126	0	1,011	0
Sheridan N.Z.	**677**	562	0	0	36	6	0	73	0
Thomas Sq. District N.Z.	**7,691**	5,584	298	279	299	230	0	1,003	0
Makai N.Z.	**3,693**	0	0	1,004	1,379	293	0	1,016	0
ATSD N.Z.	**1,853**	590	223	0	461	67	0	511	0
Unallocated*	**1,307**	0	0	0	0	0	0	0	1,307

* "Unallocated" refers to infrastructure and public facilities, as either exact future locations are unknown or else they may extend through various geographical areas.

Note: (Small percentages of these figures consist of jobs generated through "soft costs" (primarily architectural and engineering, see Section 2.4) that would in all likelihood be located outside these specific geographical areas and quite possibly outside Kaka'ako itself. Some of the "Unallocated" infrastructure and public facility direct construction jobs could also be located outside Kaka'ako – e.g., construction of schools or other public facilities serving Kaka'ako but not located in Kaka'ako. Consistent with text discussion, however, public infrastructure jobs related to Makai development (outside the ATSD) are not counted, and so "Unallocated" jobs are most likely to be in the Mauka or ATSD areas.

Table 6.4: Estimated Kaka'ako-Specific Construction Jobcount – TOD Alternative A

	TOTAL (Job-years)	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	Garage Parking Jobs	Infrastructure and Public Facilities
KAKA'AKO TOTAL	**76,196**	**49,395**	**673**	**1,446**	**7,107**	**2,996**	**709**	**12,496**	**1,374**
By General Area									
Mauka	**69,276**	48,805	449	442	5,267	2,635	709	10,969	0
Makai	**3,693**	0	0	1,004	1,379	293	0	1,016	0
Aloha Tower Special District (ATSD)	**1,853**	590	223	0	461	67	0	511	0
Unallocated*	**1,374**	0	0	0	0	0	0	0	1,374
By Neighborhood Zone									
Pauahi N.Z.	**30,641**	21,936	0	0	2,430	974	262	5,039	0
Auahi N.Z.	**17,308**	11,930	151	0	1,253	1,031	134	2,808	0
Central Kaka'ako N.Z.	**4,993**	3,323	0	50	401	106	310	802	0
Civic Center N.Z.	**1,195**	804	0	113	8	86	3	181	0
Kapi'olani N.Z.	**6,055**	4,072	0	0	846	126	0	1,011	0
Sheridan N.Z.	**677**	562	0	0	36	6	0	73	0
Thomas Sq. District N.Z.	**8,407**	6,178	298	279	293	306	0	1,054	0
Makai N.Z.	**3,693**	0	0	1,004	1,379	293	0	1,016	0
ATSD N.Z.	**1,853**	590	223	0	461	67	0	511	0
Unallocated*	**1,374**	0	0	0	0	0	0	0	1,374

* "Unallocated" refers to infrastructure and public facilities, as either exact future locations are unknown or else they may extend through various geographical areas.

Note: (Small percentages of these figures consist of jobs generated through "soft costs" (primarily architectural and engineering, see Section 2.4) that would in all likelihood be located outside these specific geographical areas and quite possibly outside Kaka'ako itself. Some of the "Unallocated" infrastructure and public facility direct construction jobs could also be located outside Kaka'ako – e.g., construction of schools or other public facilities serving Kaka'ako but not located in Kaka'ako. Consistent with text discussion, however, public infrastructure jobs related to Makai development (outside the ATSD) are not counted, and so "Unallocated" jobs are most likely to be in the Mauka or ATSD areas.

6.4 Results – Impacts

Table 6.5 and Table 6.6 shows "impacts," defined as the difference between results for each of the TOD Alternatives and results for the Future Baseline Condition results. As with operational jobs, results for construction jobs reflect the basic overall nature of the difference in the Future Baseline versus the two TOD Alternatives – substantially more residential development, somewhat less commercial activity – flowing from the land/building use changes documented in Chapter 3:

- Overall, about 37% more construction job-years would be required to build out the TOD Alternative A scenario than the Future Baseline Condition, and 24% more than the Future Baseline for Alternative B.
- Most of the additional construction employment is associated with residential development (61% increase over Future Baseline number for TOD Alternative A, 42% for Alternative B), though with a proportionately high increase in construction job-years associated with needed new public facilities and infrastructure as well.
- For both TOD Alternatives, there are small decreases in construction employment associated with Office, Retail, and Industrial development, though these are roughly balanced by additional construction employment associated with additional Parking Garage and Hotel development.
- Again, impacts are numerically most apparent in the Pauahi and Auahi Neighborhood Zones.

Table 6.5: Kaka'ako-Specific Construction Jobcount – TOD Alternative B Impacts
(Alternative B Results Minus Future Baseline Results)

	TOTAL (Job-years)	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	Garage Parking Jobs	Infrastructure and Public Facilities
KAKA'AKO TOTAL	**13,382**	**12,961**	**768**	**133**	**(1,613)**	**(330)**	**(39)**	**1,289**	**214**
% Increase, TOD Alternative B over Future Baseline	**24.1%**	42.2%	N/A	10.1%	-19.2%	-10.7%	-5.3%	12.3%	24.7%
By General Area									
Mauka	**11,682**	12,371	544	133	(2,025)	(266)	(39)	964	0
Makai	**0**	0	0	0	0	0	0	0	0
Aloha Tower Special District (ATSD)	**1,486**	590	223	0	412	(64)	0	325	0
Unallocated*	**214**	0	0	0	0	0	0	0	214
By Neighborhood Zone									
Pauahi N.Z.	**6,829**	6,704	0	0	(649)	19	30	726	0
Auahi N.Z.	**763**	471	247	0	0	0	0	45	0
Central Kaka'ako N.Z.	**1,125**	1,266	0	0	(305)	7	(70)	226	0
Civic Center N.Z.	**0**	0	0	0	0	0	0	0	0
Kapi'olani N.Z.	**1,733**	1,624	0	0	79	(103)	0	133	0
Sheridan N.Z.	**(178)**	(26)	0	(146)	0	0	0	(7)	0
Thomas Sq. District N.Z.	**1,410**	2,331	298	279	(1,150)	(188)	0	(159)	0
Makai N.Z.	**0**	0	0	0	0	0	0	0	0
ATSD N.Z.	**1,486**	590	223	0	412	(64)	0	325	0
Unallocated*	**214**	0	0	0	0	0	0	0	214

* "Unallocated" refers to infrastructure and public facilities, as either exact future locations are unknown or else they may extend through various geographical areas.
Notes: (1) Figures in parentheses are negatives. (2) Small percentages of these figures consist of jobs generated through "soft costs" (primarily architectural and engineering, see Section 2.4) that would in all likelihood be located outside these specific geographical areas and quite possibly outside Kaka'ako itself. Some of the "Unallocated" infrastructure and public facility direct construction jobs could also be located outside Kaka'ako – e.g., construction of schools or other public facilities serving Kaka'ako but not located in Kaka'ako.

Table 6.6: Kaka'ako-Specific Construction Jobcount – TOD Alternative A Impacts
(Alternative B Results Minus Future Baseline Results)

	TOTAL (Job-years)	Residential Bldg. Jobs	Hotel Jobs	Civic Jobs	Office Jobs	Retail Jobs	Industrial Jobs	Garage Parking Jobs	Infrastructure and Public Facilities
KAKA'AKO TOTAL	**20,359**	**18,654**	**673**	**133**	**(1,275)**	**(92)**	**(30)**	**2,015**	**281**
% Increase, TOD Alternative A over Future Baseline	**36.6%**	60.7%	N/A	10.1%	-15.2%	-3.0%	-4.0%	19.2%	32.5%
By General Area									
Mauka	**18,591**	18,064	449	133	(1,687)	(28)	(30)	1,690	0
Makai	**0**	0	0	0	0	0	0	0	0
Aloha Tower Special District (ATSD)	**1,486**	590	223	0	412	(64)	0	325	0
Unallocated*	**281**	0	0	0	0	0	0	0	281
By Neighborhood Zone									
Pauahi N.Z.	**9,209**	8,235	0	0	(305)	180	40	1,059	0
Auahi N.Z.	**4,576**	4,038	151	0	0	0	0	387	0
Central Kaka'ako N.Z.	**1,125**	1,266	0	0	(305)	7	(70)	226	0
Civic Center N.Z.	**0**	0	0	0	0	0	0	0	0
Kapi'olani N.Z.	**1,733**	1,624	0	0	79	(103)	0	133	0
Sheridan N.Z.	**(178)**	(26)	0	(146)	0	0	0	(7)	0
Thomas Sq. District N.Z.	**2,126**	2,926	298	279	(1,156)	(112)	0	(108)	0
Makai N.Z.	**0**	0	0	0	0	0	0	0	0
ATSD N.Z.	**1,486**	590	223	0	412	(64)	0	325	0
Unallocated*	**281**	0	0	0	0	0	0	0	281

* "Unallocated" refers to infrastructure and public facilities, as either exact future locations are unknown or else they may extend through various geographical areas.
Notes: (1) Figures in parentheses are negatives. (2) Small percentages of these figures consist of jobs generated through "soft costs" (primarily architectural and engineering, see Section 2.4) that would in all likelihood be located outside these specific geographical areas and quite possibly outside Kaka'ako itself. Some of the "Unallocated" infrastructure and public facility direct construction jobs could also be located outside Kaka'ako – e.g., construction of schools or other public facilities serving Kaka'ako but not located in Kaka'ako.

7. RESULTS: PUBLIC SERVICES AND FACILITIES

This chapter presents results for Public Safety (fire and police), Public Health (emergency services and hospitals), Education, and Parks and Recreation. At issue are both social aspects (adequacy of public service) and cost impacts borne by public agencies and taxpayers. Cost impacts proved relatively easier to quantify. All impacts are discussed by specific agency/category.

Agency-specific results are presented in separate sections *both* at the Kakaʻako-specific *and* the islandwide levels, with islandwide cost results for public facilities and infrastructure feeding into construction job results for the following Chapter 8. The Kakaʻako-specific results also informed the foregoing Chapter 6 results on Kakaʻako-specific direct construction employment.

Also feeding into both Chapter 6 and subsequent chapters are construction parameters and costs for public infrastructure projects – e.g., wastewater systems – gathered by other EIS consultants and/or carried over from past HCDA studies.

Within each level of analysis (Kakaʻako-specific and islandwide), two categories of impact are considered:

- Annual ongoing operational impacts and associated costs (e.g., additional personnel required to serve an expanding population) for public services and facilities;
- Any one-time construction needs and associated costs for facilities (e.g., need to build a new structure that would otherwise not have been required) and for public infrastructure.

7.1 Methods and Caveats

Public Services and Facilities: Most methods used to determine the following results are described in detail in the foregoing Section 2.5, which addressed both the Kakaʻako-specific and islandwide methodologies. As explained there, Kakaʻako-specific impacts are not included with islandwide impacts because they reflect assumptions about *where* people will live on Oʻahu, not *whether* they will be on Oʻahu at all. Islandwide cost impacts flow only from net islandwide impacts calculated in the following Chapter 8.

It is also worth reiterating that methods here are agency-specific – that is, each agency responded to available information about likely population effects with its own internal procedures and calculations, sometimes derived as part of a communication process back and forth with JMK Associates. Therefore, some additional methodological information unique to particular agencies is provided in this chapter.

Finally, it is further worth reiterating that original agency responses in 2013 involved only the Future Baseline Condition and what is now labeled TOD Alternative A. Stated impacts for TOD Alternative B derive from one of two approaches:

1. If the agency provided formulas or ways of computing needs based on inputs such as population or residential units, those formulas were applied to appropriate TOD Alternative B inputs.
2. If the agency simply said the level of development projected for Alternative A would require X new facilities and Y new personnel, at estimated total cost Z, the same values X, Y, and Z were conservatively assumed to apply to the lower-density TOD Alternative B scenario as well.

All the cautions described in the past few chapters again apply here as well, and it should again be particularly remembered that the impacts are for a theoretical *full build-out* of Kakaʻako under the various scenarios. Few or none of the projected full needs are imminent, although the current spate of actual and proposed residential construction projects in Kakaʻako is catching the attention of public agencies and generating discussions with HCDA about ways to address developing impacts on public services.

Public Infrastructure: Cost information was processed but not generated by JMK Associates. Some relevant multipliers were provided in the foregoing Section 2.5. All other sources, assumptions, and methods are discussed in the following Section 7.2.7.

7.2 Kakaʻako-Specific Impacts

As has been the case for results in the past several chapters, this section looks at what will happen in Kakaʻako alone under each TOD Alternative (A and B), regardless of whether net islandwide effects would be the same under the Future Baseline Condition. Information for each agency is followed by summary tables for each TOD Alternative, A and B, at the end of the section (Table 7.15 and Table 7.16, Section 0).

7.2.1 Public Safety – Fire Department

According to the Honolulu Fire Dept. (HFD),[27] consequences include the following:

Present Conditions – Kakaʻako is currently served by the Kakaʻako Fire Station (located in the western or ʻEwa portion of Kakaʻako at 555 Queen St.) and the Pāwaʻa Fire Station (located at 1610 Makaloa St, .just past the eastern or Diamond Head district boundary of the Kakaʻako Community Development District). Both stations were built more than 40 years ago, and would eventually require replacement due to age alone.

[27] Letter of Sept. 20, 2013 from HFD Chief Manuel P. Neves and various follow-up discussions with Battalion Chief Socrates Bratakos of the Fire Prevention Bureau.

Operational Impacts – The projected Kaka'ako residential population growth under the Future Baseline Condition would, at full build-out, require an increase of ten on-duty fire-fighters (FFs) (or 30 FFs to cover all shifts), two support staff, and two fire trucks. Twice those numbers (i.e., 60 FFs, four support staff, etc.) would need to be added for TOD Alternative A, with the same needs conservatively assumed for the somewhat lower-density TOD Alternative B.

Thus, the Kaka'ako-specific impact of either TOD Alternative (A or B) would be annual operating costs associated with the difference in these numbers – which amount to 30 FFs, two support staff, and two fire trucks.

With a current average HFD staff salary a little under $82,000, the average annual personnel cost for each TOD Alternative (A and B) would be about $2.6 million (for the additional 32 positions). One-time purchase costs for fire trucks would be about $500,000 each, or $1 million total.

Facility Construction Impacts – While the current fire stations will need to be replaced even if there is zero population growth in their service areas, expanded future Kaka'ako populations (and attendant needs for more FFs and equipment) under the various scenarios would necessitate larger and thus more costly replacement structures.

HFD estimates the additional construction cost for each station – over and above replacement costs for stations of the current size – would be in the range of $8 to $10 million. One expanded station would be needed to house the additional FFs and fire trucks under the Future Baseline Condition, and a second expanded station would be needed under each of the TOD Alternatives. Thus, the one-time facility cost impact of the TOD Alternatives (either A or B) would be the $8 to $10 million construction increment for a second station, which will be conservatively operationalized as a single higher-end $9.5 million for purposes of subsequent fiscal cost-revenue analysis. (Including fire trucks, one-time costs are $10.5 million.)

Other Impacts – Fire Chief Neves wrote that HFD "ability to provide services in Kaka'ako will also be impacted by transit-oriented development, including rail infrastructure, traffic calming, and pedestrian friendly street features, and the potential increase in vertical height of the area's buildings." HFD was, however, unable to quantify such impacts. Regarding slower response times for fires at the top of tall buildings, these would depend on various building-specific factors – such as availability to firefighters of various numbers of elevator banks or stairwells, presence of an auxiliary water supply above 400 feet, layout of floors, and other parameters. (Note that difficulties associated with the provision of water above 400 feet would be associated only with TOD Alternative A and not TOD Alternative B.)

7.2.2 Public Safety – Police Department

Present Conditions: The Honolulu Police Dept. (HPD) currently has no police facility in Kaka'ako, though the island's Main Station on South Beretania St. is just above Kaka'ako's mauka boundary (S. King St.). Kaka'ako is part of HPD's District 1, Central Honolulu, which includes the downtown Honolulu area from Liliha Street to Punahou Street and from Round Top Drive to Ala Moana Beach Park, including the Aloha Tower.

Operational Impacts: According to the HPD,[28] the projected Kaka'ako residential population growth under the Future Baseline Condition would, at full build-out, require an increase of about 30 police officers, based on the December 2012 ratio of 8.9 police officers per 10,000 people in District 1. There would also be additional costs at the main station – e.g., equipment, supplies, vehicles, etc., though some of these would of course also be required if the projected population increase occurred elsewhere in District 1 or other places supported by the main station. While the salary range for a City and County police officer currently is between $4,439 to $6,392 per month, HPD concurred with an *augmented* average salary estimate from JMK Associates of $8,000 per month ($96,000 annually) in order to include appropriate portions of the supplemental costs. Using the projected Future Baseline Condition total de facto population of 33,844 (Table 4.2), this results in an estimated average annual operating cost impact of $2.89 million at full build-out under that scenario.

Under TOD Alternative B, the ratio of 8.9 police officers applied to the de facto population at full build-out would generate a total demand for nearly 40 police officers – and, at $96,000/year for salaries and support, a total operating cost increase of $3.8 million. The impact, or difference in figures between the two scenarios, would thus be about 9.45 more police officers and $907,500 additional personnel costs per year.

Under the higher-density TOD Alternative A, this same ratio would generate a total demand for 43 police officers – and, a total operating cost increase of $4.12 million. The impact, or difference in figures between the two scenarios, would thus be nearly 13 more police officers and $1.23 million additional operating costs per year.

Additionally, under the TOD Alternative A, the HPD would need to rent space for a small field and report writing office in which officers can complete reports, miscellaneous office-type duties, and other tasks. Discussions between JMK Associates and HPD officials generated an assumed rental cost of $30,000/year ($2,500/month). The same figure may conservatively be applied to TOD Alternative B.

Facility Construction Impacts: HPD envisioned no construction of new police facilities for TOD Alternative A. Therefore, none are envisioned in this analysis for the lower-density Alternative B either.

[28] Letter of Sept. 13, from Asst. Chief Clayton G. Kau (for Chief Louis M. Kealoha), and various follow-up communications with Research Analyst Emily Ogasawara.

Other Impacts: Although the HART rail stations in or near Kaka'ako would be constructed with or without the proposed TOD Alternatives, HPD wished to emphasize its estimate that the overall transit project, regardless of population implications, would require an additional 251 employees of various kinds, with annual cost of about $17.3 million.

7.2.3 Public Health – Emergency Services

Present Conditions: The City and County of Honolulu Emergency Services Dept.[29] has two divisions –

- Ocean Safety and Lifeguard Services Division. This Division is City-funded and focuses on marine emergencies. It is not directly affected by population or economic changes in Kaka'ako (except indirectly through harbor and beach park usage) or any other specific geographical neighborhood on land. However, the Department is in discussions with HCDA to provide land on a lease basis for a new Ocean Safety Facility at Kewalo Basin, to replace a current facility in the Waikīkī Natatorium, which is to be demolished. The Department expects to request City Council funding approval in FY2016. This activity is independent of the proposed Kaka'ako TOD Alternatives, and so no further discussion of Ocean Safety functions will be made here.

- Emergency Medical Services Division (EMSD). This Division – administered by the City but ultimately funded by the State Dept. of Health – provides emergency medical service and ambulance transportation in response to land-based crises. The EMSD will be the primary focus of this discussion.

  Islandwide, there are 20 EMS units and two single-response units. These are EMS emergency response vehicles staffed with a single paramedic and treats victims on scene until a transport unit arrives. Of these, five EMS units serve the overall metropolitan area from Waikīkī to Kalihi/Iwilei. There are no specific service-area boundaries, but Kaka'ako is usually served by either (1) the Makiki and Metro One EMS units at 1426 Young St., or (2) the Baker One unit located at the Queen's Medical Center, 1301 Punchbowl St.

  Given current population growth, the EMSD considers metropolitan Honolulu to be on the cusp of needing a new EMS unit. The Department has also been (as of late 2013) in discussions with HCDA about another 24-hour/day site in Kaka'ako (in the area where Fisherman's Wharf now stands) to meet this need. A tentative plan is to locate a trailer from which the ambulance crew could operate, as has been done in other parts of the island. Although this action, if it occurs, would also be independent of substantial future Kaka'ako population growth, it does raise the strong possibility that Kaka'ako would be effectively served long before 2035 by at least one new EMS station – although that station may also serve other nearby neighborhoods as well.

[29] Information in this section reflects various communications with and from Director Mark Rigg, October to December 2013.

Operational Impacts: The question for analysis here is what additional future needs, if any, the EMSD would face if the present Kaka'ako de facto population and jobcount were to grow by 2035 to the levels estimated in Chapters 4 and 5.

Future EMSD needs would of course depend on overall islandwide and metropolitan growth, as there is no official separate Kaka'ako EMSD service area. However, the EMSD estimates that growth under the Future Baseline Condition would contribute to need for a second new EMS station. Based on the new station currently proposed for Kaka'ako, it would have annual operating costs of about $1.04 million (primarily for salaries). However, no additional service would thereafter be required for TOD Alternative A – or, logically, for the lower-density TOD Alternative B. Therefore, the impact as defined for this EIS would be $0, according to the agency.

Facility Construction Impacts: Full build-out costs for the proposed new Kaka'ako EMS unit would be about $4 million, which provides the best estimate for construction costs for a possible second unit under the Future Baseline Condition. However, no additional facility construction costs are envisioned for TOD Alternative A (and thus in this analysis for TOD Alternative B as well).

Other Impacts: EMSD notes that transport time to metropolitan hospitals are short from Kaka'ako. They would be mainly to Queens and Straub, and a little further to Kuakini. Kaiser Health Care plans will be transported to Moanalua Kaiser.

7.2.4 Public Health – Medical Facilities

Assessment of impacts on medical facilities differs from other analyses in this chapter in that service is provided by a network of providers rather than a single agency. Most are private-sector providers, and so it is generally difficult and/or inappropriate to estimate costs that would be borne by government.

Medical facilities are of several types –

- Acute Care Facilities: These offer a wide range of medical, surgical, obstetric and pediatric services. These facilities primarily treat patients with conditions that require a hospital stay of fewer than 30 days.[30]

- Long Term Care Facilities: These may be defined as institutions that provide healthcare to people who are unable to manage independently in the community.[31] These are also known as "skilled nursing facilities" or "nursing facilities" and are either free-standing or hospital-based.

[30] Blue Cross Blue Shield Blue Care Network. [December 2013]. http://www.bcbsm.com/index/health-insurance-help/glossary.html
[31] Center for Disease Control and Prevention. [December 2013]. http://www.cdc.gov/HAI/settings/ltc_settings.html

- Specialty Care Facilities: These are acute care facilities that provide specialized services and specially trained personnel to care for a specific portion of the injured population, such as pediatric, burn injury, or spinal cord injury patients.[32]

Many of these facilities are run by the private sector, though with overall licensing supervision by the Hawai'i State Dept. of Health. Table 7.1 shows that the number of State-approved medical facilities has been declining since 2000:

Table 7.1: Number of State Approved Medical Facilities 2000-2010

Number of Facilities	Acute Care [a]	Long- term Care [a]	Specialty care	Total [b]
2000	24	45	24	74
2001	21	45	22	73
2002	20	45	23	72
2003	20	45	19	68
2004	22	47	20	70
2005	21	49	17	68
2006	19	43	13	62
2007	19	46	13	63
2008	19	46	14	66
2009	20	49	14	69
2010	20	48	15	70

Source: Hawai'i State Data Book. 2012. Table 2.25 Number and Bed Capacity of State-Approved Facilities, By Type of Facility 2000 2010. http://dbedt.hawaii.gov/economic/databook/db2012/

Notes: Excludes Tripler Army Medical Center. Figures based on facilities that reported their activity

[a] Acute/SNF swing beds are classified under long-term care.

[b] Institutions providing more than one kind of care are counted only once.

Present Conditions: Kaka'ako is not uniquely served by any one of the above types of health care facilities. It is part of the wider metropolitan Honolulu area currently served by numerous facilities, none of which (with the exception of a clinic associated with the John A. Burns School of Medicine) is now located in Kaka'ako itself –

- **Acute Care Hospitals** serving Kaka'ako and other parts of urban Honolulu include The Queen's Medical Center (a private non-profit facility, the largest hospital in Hawai'i, a trauma hospital, and part of The Queen's Health Systems), Kuakini Medical Center (a non-profit hospital that is part of Kuakini Health System), and Straub Clinic and Hospital (also a non-profit hospital under the Hawai'i Pacific Health System.

- **Long Term Care Facilities** serving the wider Honolulu area (including but not limited to Kaka'ako) include (a) Lē'ahi Hospital, which is a State-run nursing facility and tuberculosis hospital; (b) Kuakini Medical Center and The Queen's Medical Center, which also offer hospital-based skilled nursing services; (c) Maluhia; (d) Hale

[32] National Highway Traffic Safety Administration. 1996. *EMS Agenda for the Future*. Washington, D.C. [December 2013]. http://www.nhtsa.gov/people/injury/ems/emstraumasystem03/glossary.htm

Nani; (e) Oahu Care Facility; (f) Island Nursing and Rehab Center; and several other skilled nursing facilities.

- **Specialty Care Facilities** serving Honolulu/Kaka'ako include (a) Shriners Hospitals for Children-Honolulu, a pediatric orthopedic hospital providing care for children with bone, joint, and neuromuscular conditions; (b) Kapi'olani Medical Center for Women & Children, the state's only specialty care facility for women and children and only pediatric intensive care unit serving all islands and the Pacific Basin; and (c) The Rehabilitation Hospital of the Pacific, which provides rehabilitation services to patients with physical and cognitive disabilities.

- **Health Care Clinics** serving the area include the Waikīkī Health and Kalihi-Pālama Health Centers, both of which are federally-qualified health centers (FQHCs). FQHCs are organizations receiving grants under Section 330 of the Public Health Service Act (PHS). They receive reimbursement from Medicare and Medicaid, and supply comprehensive health services to underserved areas or populations based on a sliding fee scale.

- **Other:** Honolulu is also served by various health care providers such as home health agencies and hospices (which mostly provide care in people's homes), physician practices, urgent care clinics, and dialysis and rehabilitation centers.

The Healthcare Association of Hawai'i (HAH)[33] and the State Health Planning & Development Agency (SHPDA)[34] both report that the health care system throughout Hawai'i – in urban Honolulu and elsewhere – is currently stressed by various factors:

1. The shutdown in 2011 of two O'ahu hospitals (Hawai'i Medical Center East in Liliha and Hawai'i Medical Center West in 'Ewa). The closure of these hospitals, which employed 990 workers, eliminated more than 340 hospital beds. While ERs have been operating at capacity since these closures, the opening of The Queen's Medical Center-West O'ahu in May 2014 is thought to have relieved some of the systemic pressure by providing health services to patients who live on the Leeward side closer to their homes. The experts consulted could not quantify the impact of its opening, but did believe it is alleviating some of this stress.

2. The Great Recession, while technically ended, has left many without insurance and/or more complex health needs. Because of this, emergency rooms and community health centers face greater pressure.

3. Changes in the national health care system following the nation's health reform law enacted in March 2010 (i.e., the Affordable Care Act) are expected to increase

[33] Telephone conversation and email communications between JMK Assoc. Staff and Rachael Wong, Dr PH, Vice President and COO of Healthcare Association of Hawai'i (HAH) in December 2013 and February 2014. Additional email communication with Ms. Wong in October 2014.

[34] Information received via email communications between JMK Assoc. Staff and State Health Planning & Development Agency Director of Health Sue Radcliffe, MA in December 2013 and January 2014.

patient demand for and access to health care services. This could cause further stress on existing facilities.

None of these factors relate to population growth in any particular area, including Kaka'ako, but represent a challenge to the quality of health care both at present and also for the future growing population of Hawai'i in general.

Operational Impacts: Whether population growth takes place in Kaka'ako or elsewhere on O'ahu, the islandwide and statewide resilience of the health care system requires improvement. Population growth will otherwise continue to challenge the adequacy of health care throughout Hawai'i.

Because it cannot be currently estimated to what extent either TOD Alternative (A or B) will increase the population of the overall urban Honolulu on a net basis – i.e., because it cannot be known how many people would be living in urban Honolulu outside Kaka'ako under the Future Baseline Condition – it is difficult to estimate the impact on any current facility or on the network of facilities serving both Kaka'ako and the rest of urban Honolulu. No cost impacts can be calculated.

Facility Construction Impacts: The redirection of some population growth into Kaka'ako is highly unlikely to result in any publicly-funded facility construction costs in the area that would not occur anyway. At the moment, no such new construction is expected.

Other Impacts: From the viewpoint of adequacy of services, the system is now stressed and has the potential to be further stressed by population growth, whether in Kaka'ako, other parts of urban Honolulu, or the rest of the island.

7.2.5 Education

Present Conditions: As of late 2013, the State Dept. of Education's (DOE's) most recent available estimates indicate there are now (Fall 2012) about 450 students with Kaka'ako addresses in various public elementary, middle, and high schools serving the area.[35] Five schools from two complexes (Kaimukī and McKinley Complexes) serve Kaka'ako and surrounding urban areas. These are Royal and Ka'ahumanu Elementary Schools, Central and Washington Middle Schools, and President William McKinley High School, with recent enrollment figures shown in Table 7.2 below. These are all public schools operated by the DOE. Voyager Public Charter School, the area's only charter school serving grades K-8, recently relocated out of the area. Although there are more than 100 private pre-schools serving the Honolulu area (112), only 12 public pre-schools operate in Honolulu, none of which are located in Kaka'ako. There have, however, been recent proposals to open two new (private) pre-schools in Kaka'ako, including a Seagull Schools and a Montessori School. [36]

[35] This information and subsequent statements attributed to DOE derive from various communications (face-to-face, telephone, and written) between JMK Associates and personnel within the Planning Section, DOE Facilities Development Branch, October-November 2013.
[36] Pacific Business News. "Another school planned for Oahu's growing 'Third City' of Kaka'ako". Apr. 15, 2014. http://www.bizjournals.com/pacific/blog/2014/04/another-school-planned-for-oahus-growing-third.html

Table 7.2: Present and Recent Historic Enrollment in Schools Serving Kaka'ako

School	2006	2007	2008	2009	2010	2011	2012	2013
McKinley Complex								
Royal Elementary	385	373	313	330	351	364	352	376
Ka'ahumanu Elementary	573	566	566	582	583	560	573	597
Central Middle	466	457	407	407	394	371	334	351
McKinley High	1,877	1,857	1,809	1,789	1,782	1,790	1,757	1,677
Kaimukī Complex								
Washington Middle	1,048	1,032	897	856	817	840	817	794

Source: DOE Facilities Development Branch

DOE representatives have confirmed that Royal Elementary and Queen Ka'ahumanu Elementary are currently operating at near capacity and may not be able to accommodate large surges in enrollment in the future. While DOE projections anticipate negative growth for both of the elementary schools as well as for Central Middle school over the next five years (and hence increasing capacity for future growth), Royal School is expected to have the ability to provide space for fewer than 30 additional children by 2018 under present conditions. (See Table 7.3)

Table 7.3: Current and Near-Term Future Anticipated School Capacity

	School Capacity[a]	2013-2014 Residual Capacity[b]	2018-2019 Residual Capacity[c]
McKinley Complex			
Royal Elementary	368	-8	29
Ka'ahumanu Elementary	623	26	79
Central Middle	843	492	587
McKinley High	2,012	335	199
Kaimukī Complex			
Washington Middle	1,210	416	354

[a] Maximum Enrollment. Capacity assessed in 2012-2013 via DOE's "ARTS Classroom Space Survey"
[b] 2012-2013 ARTS Classroom Space Survey less actual 2013-2014 Enrollment
[c] 2012-2013 ARTS Classroom Space Survey less projected 2018 Enrollment

The official DOE policy[37] regarding enrollment guidelines for new schools lays out standard student enrollment ranges and land acreage needed to accommodate them. The DOE recommends that elementary schools (grades K-5) serve 400-750 students on 8 to 15 usable acres;[38] that middle schools (grades 6-8) serve 500-1,000 students on 15-20 usable acres; and that high schools (grades 9-12) serve 800-1,600 students on 45-55 usable acres. Future schools will likely have the maximal capacities.

With this policy in mind, the DOE uses residential unit counts, as well as current enrollment to set student generation rates for a particular area. In the urban Honolulu

[37] State of Hawaii Board of Education. BOE Policies. 6000 Series. 6701. https://lilinote.k12.hi.us/STATE/BOE/POL1.NSF/85255a0a0010ae8285255534006047 9d/b31a0aa2c2ca52b10a2566a30082892f?OpenDocument
[38] According to DOE, "Useable is generally defined as land free of encumbrances determined to be unnecessary by the department of education, slope of five percent or less, with no ravines or stream beds".

area including Kaka'ako, the DOE has set student generation rates at 0.082 students per multi-family dwelling unit for elementary schools; 0.033 students per multi family dwelling unit for middle schools; and 0.054 students per multi family dwelling unit for high schools.

When measuring the impact of the development of additional units in Kaka'ako over area school facilities, it cannot be assumed that all of the pressure placed on those schools will come from the Kaka'ako area alone. The five schools mentioned above serve not only Kaka'ako, but surrounding areas as well. In fact, service areas for middle and high schools in particular serve a *much* larger area than Kaka'ako alone. However, it is not possible to know for certain what the growth will be in the remainder of these various school service areas.

Up until a few years ago, DOE believed that space would be made available for school facilities on the State-owned former Pohukaina School site, which is now proposed for an affordable housing project. The Pohukaina site is currently used for a State Library book processing center. The library is stated to move to an 'Aiea location by the end of the 2013-2014 fiscal year.

Operational Impacts: The DOE has developed various location-specific multipliers for estimating future student counts generated by new developments, intended for use in eventual impact fee calculations. The multipliers for the urban Honolulu area including Kaka'ako are based on area-wide estimates, not current Kaka'ako student enrollments. If applied to current Kaka'ako dwelling units, they would generate an estimated student count far in excess of the actual present student count. Use of these multipliers is thus likely conservative, in that they produce estimated future enrollments more substantial than might be derived from an extrapolation of present Kaka'ako conditions.

Based on these DOE multipliers, the number of students from Kaka'ako will increase significantly for build-out under the Future Baseline Condition and even more for build-out under TOD Alternatives A and B (see Table 7.4).

Table 7.4: Kaka'ako-Specific Impact on Students Served

	DOE Student Generation Rates (Per Unit)	Future Baseline Scenario[a]	TOD Alternative B[b]		TOD Alternative A[c]	
		# Students	# Students	Impact (Difference)	# Students	Impact (Difference)
Elementary	0.082	1,734	2,180	446	2,375	641
Middle	0.033	698	877	180	956	258
High	0.054	1,142	1,436	294	1,564	422
Total:		**3,574**	**4,493**	**920**	**4,896**	**1,322**

[a] Generation rate times dwelling units for build-out under Future Baseline, estimated to reach 21,146
[b] Generation rate times dwelling units for build-out under TOD Alternative B, estimated to be 26,588
[c] Generation rate times dwelling units for build-out under TOD Alternative A, estimated to be 28,968

The following operational cost estimate (Table 7.5) is based on the most recent overall DOE operating budget divided by total enrollment:

Table 7.5: Kaka'ako-Specific Impact on DOE Operational Costs

	Change in Students	Student Cost[a]	Total Annual Impact
TOD Altern. B	920	$11,854	$10,903,680
TOD Alern. A	1,322	$11,854	$15,670,015

[a] State of Hawaii DOE Financial Report. Office of Fiscal Services. July 1, 2010- June 30, 2011. http://www.hawaiipublicschools.org/DOE%20Forms/State%20Reports/FinancialReport2010-2011.pdf. Updated to 2012 dollars using Honolulu CPI.

It is to be remembered that both these expenditures and the change in student counts are expected to occur elsewhere on the island in any event – this "impact" is a *shift* or concentration into Kaka'ako.

Facility Construction Impacts: The student count figures in Table 7.4, when divided by maximum DOE school enrollments (considered appropriate by DOE Facilities Branch to use when considering future urban school sites) yield the following percentage equivalents of new schools needed at each level for various planning scenarios (Table 7.6) – *if* school district lines were redrawn such that Kaka'ako alone were to be the primary service area for schools:

Table 7.6: Kaka'ako Schools Needed Under Various Alternatives

	Max. Capacity for Schools	Future Baseline	TOD Alternative B		TOD Alternative A	
			Need	Impact (difference)	Need	Impact (difference)
Elementary	750	231%	291%	60%	317%	86%
Middle	1,000	70%	88%	18%	96%	26%
High	1,600	71%	90%	18%	98%	26%

Illustrative Explanation: Previously calculated Future Baseline student count of 1,734 elementary school students is equivalent to 2.31 times the number of students in one elementary school.

The table suggests that, under TOD Alternative A, build-out would generate enough students from Kaka'ako alone to fill more than three elementary schools and almost enough to fill one middle and one high school. Compared to build-out under the Future Baseline Condition, that is almost the equivalent of one additional one elementary school and fractions (about one-quarter each) of additional middle and high schools. For the lower-density TOD Alternative B, the impact numbers are equivalent to 60% of one elementary school and nearly one-fifth of additional middle and high schools.

However, because Kaka'ako is part of a larger DOE service area (particularly for middle and high schools), it is difficult to predict for certain at what point the need for any one particular new school would be generated – as that depends in part on growth in adjacent areas as well. That is, it is difficult to say to what extent actual DOE construction costs in future would depend *only* on Kaka'ako population growth.

The standard DOE approach – utilized in this analysis for costing purposes – instead uses *average* construction and land cost multipliers per dwelling unit, for various parts of the island. The following Table 7.7 uses DOE-supplied multipliers for urban Honolulu.

Table 7.7: Additional Kaka'ako-Specific School Facility Costs (DOE Multipliers)

FUTURE BASELINE ALTERNATIVE	Construction Cost	Land Cost	Combined Cost
Total Increase over Existing Units	*12,528*	*12,528*	*12,528*
Elementary[a]	$34,739,336	$62,312,823	**$97,052,159**
Middle[b]	$17,501,209	$18,465,843	**$35,967,051**
High[c]	$44,999,529	$104,305,702	**$149,305,231**
Total:	**$97,240,074**	**$185,084,367**	**$282,324,442**
TOD ALTERNATIVE B	**Construction Cost**	**Land Cost**	**Combined Cost**
Total Increase over Existing Units	*17,970*	*17,970*	*17,970*
Elementary[a]	$49,832,106	$89,385,105	**$139,217,212**
Middle[b]	$25,104,743	$26,488,469	**$51,593,212**
High[c]	$64,549,919	$149,622,113	**$214,172,032**
Total:	**$139,486,769**	**$265,495,687**	**$404,982,456**
IMPACT (DIFFERENCE)	**Construction Cost**	**Land Cost**	**Combined Cost**
Change in Units over Future Baseline	*5,443*	*5,443*	*5,443*
Elementary[a]	$15,092,770	$27,072,283	**$42,165,053**
Middle[b]	$7,603,534	$8,022,627	**$15,626,161**
High[c]	$19,550,390	$45,316,411	**$64,866,801**
Total:	**$42,246,695**	**$80,411,320**	**$122,658,014**
TOD ALTERNATIVE A	**Construction Cost**	**Land Cost**	**Combined Cost**
Total Increase over Existing Units	*20,350*	*20,350*	*20,350*
Elementary[a]	$56,429,621	$101,219,234	**$157,648,855**
Middle[b]	$28,428,482	$29,995,406	**$58,423,888**
High[c]	$73,095,997	$169,431,311	**$242,527,308**
Total:	**$157,954,100**	**$300,645,952**	**$458,600,052**
IMPACT (DIFFERENCE)	**Construction Cost**	**Land Cost**	**Combined Cost**
Change in Units over Future Baseline	*8,817*	*8,817*	*8,817*
Elementary[a]	$21,690,285	$38,906,411	**$60,596,697**
Middle[b]	$10,927,273	$11,529,564	**$22,456,837**
High[c]	$28,096,468	$65,125,609	**$93,222,077**
Total:	**$60,714,026**	**$115,561,584**	**$176,275,610**
[a] Elementary construction and land multipliers:	$2,773	$4,974	**Source for Multi-**
[b] Middle school construction and land multipliers:	$1,397	$1,474	**pliers:** Hawai'i
[c] High School construction and land multipliers:	$3,592	$8,326	State DOE

It suggests that DOE would have to spend a little under $123 million more for construction and land costs under TOD Alternative B, and $176 million more under Alternative A, than under the Future Baseline Condition.

Again, however, it should be remembered this means the DOE would need to spend this money in Kaka'ako rather than elsewhere on the island, as both alternatives are about redirecting population to Kaka'ako. Additionally, these Kaka'ako-specific facility costs, as well as all preceding Kaka'ako-specific impact numbers, are likely somewhat overstated because some of the additional units (and their student counts) estimated to be developed at build-out of each alternative and could, under the Future Baseline Condition, instead still be developed in the same DOE school service areas near to Kaka'ako. Thus***, similar DOE calculations would apply to growth wherever it occurs on O'ahu.***

Other Impacts: Probably the most important actual consequence of Kaka'ako population growth for school development is the need to find land for new schools. This is an issue facing DOE in all areas now being planned or considered for higher-density TOD uses. DOE has yet (at the time of this writing) to initiate any comprehensive analyses to identify potential sites in Kaka'ako or other TOD areas, and has not conducted any in Kaka'ako for at least the past decade. However, there are no currently known candidate sites in Kaka'ako itself. A further constraint in Kaka'ako is that the Makai area (below Ala Moana Blvd.) is ruled out for DOE use because this area is largely in the potential tsunami inundation zone.

It is no more certain that additional candidate sites could be identified close to Kaka'ako than in Kaka'ako itself. However, if such a solution were to be found feasible – i.e., continuing to send Kaka'ako students to schools bordering the area, as is now the case – this could arguably affect the sense of community within greater Kaka'ako or its constituent neighborhoods.

According to DOE:

> As late as December 2011, the DOE was operating with the understanding that space would be made available for a school facility within whatever development project took place on the former Pohukaina School site.
>
> Per HRS302A-1601 the DOE is authorized to collect land and money from developers of residential housing through the imposition of impact fees. The fee formula is set in law and is heavily weighted towards providing the land (or cost of land) needed for new schools with just a 10% contribution toward construction costs. (The legislative intent was that the balance of construction funds would come from state funds.) To date, the formula has been used principally on suburban-style projects with large undeveloped acreage.
>
> The formula has not yet been applied in high density urban areas, where there is limited land and the cost of the land is much higher. Because of the cost of land associated with urban development, it is expected that the impact fee formula would yield a higher per unit cost in developing urban areas such as Kaka'ako.
>
> The impact fee formula, as stated in law, assumes that a new residential project will have an impact on student enrollment at elementary, middle and high schools. In Kaka'ako, there is an unusual situation of insufficient space in the elementary schools that serve the area, but currently significant capacity in the middle schools and some limited additional space in the high school. It is unclear at this point if a legal interpretation of the impact fee law would permit application of only those portions of the formula that are needed (i.e. fees charged based on providing elementary school capacity only).
>
> The DOE would need to determine if this exception would be possible and then what the scenario might be should future capacity be required in middle and high schools if Kaka'ako continued to develop.

7.2.6 Parks and Recreation

Present Conditions: There are currently seven (7) public parks in Kaka'ako occupying nearly 54 acres of land. Both the Mother Waldron Neighborhood Park and the Kawaiaha'o Street Mini Park are managed by the City and County of Honolulu's Department of Parks and Recreation (DPR), while the rest are managed by HCDA. No Kaka'ako parks are managed by the State Parks Division of the Dept. of Land and Natural Resources. Private recreational facilities associated with particular buildings provide another 16 acres in the area. (See following Table 7.8.) In addition, DPR's Ala Moana Regional Park abuts the District on the east and serves as a regional park for greater Honolulu. Historic Thomas Square abuts the district on the north.

Table 7.8: Public and Private Recreational Facilities in Kaka'ako

Public Recreation	Agency/Mgnt	Acres
Mother Waldron Neighborhood Park	City DPR	2.73
Kolowalu Park [a]	State HCDA	2.57
Restaurant Row Park	State HCDA	1.79
Kawaiaha'o Street Mini Park	City DPR	0.2
Kaka'ako Gateway	State HCDA	2.2
Kaka'ako Waterfront Park [b]	State HCDA	38.9
Kewalo Basin Park	State HCDA	5.2
Total:		**53.59**
Private Recreation	**Agency/Mgnt**	**Acres**
One Waterfront Plaza and Towers	Private	0.77
Pacific Park Plaza	Private	0.94
404 Pi'ikoi	Private	4.98
Imperial Plaza	Private	0.44
Kamakee Vista	Private	0.53
Pohulani	Private	0.95
Kauhale Kaka'ako	Private	0.68
Na Lei Hulu Kūpuna	Private	0.07
Honuakaha	Private	0.39
One Archer Lane	Private	0.44
Hokua	Private	1.89
Moana Pacific	Private	2.17
909 Kapi'olani	Private	0.47
Keola Lai	Private	0.46
Pacifica	Private	0.62
680 Ala Moana	Private	0.29
Total:		**16.09**

[a] Kolowalu Park (sometimes referred to as Queen Street Park) was developed by HCDA with thoughts to possibly convey it to DPR upon legislative approval. However this has been delayed because of issues with encroachment of adjacent buildings on the park site.

[b] Park-zone land, including Look Lab site

Source: HCDA. 2014. http://dbedt.hawaii.gov/hcda/files/2014/04/kcdd-park-and-private-recreation-space-032714.pdf

Current HCDA rules require that 55 SF of recreational space be allocated per dwelling unit developed in Kaka'ako. The City and County of Honolulu standards call for 110 SF of green space[39] per dwelling unit for any high rise multi-family or town house development anywhere on the island. While under these City standards, the provision of green areas within Kaka'ako has currently been met, it should be noted that the Mauka Area Rules (HAR Chapter 22 §15-217-8) state that "Recreational space" means an outdoors or indoors open space within a development that can be located at any level and is available for recreational use. It is hence limited not only to green space, parks, or playgrounds, but can also include parking areas.

In discussions for this study, DPR expressed concerns regarding the current inventory of parks and adequacy of their uses in the area.[40] DPR said the need in Kaka'ako is not for small private parks sprinkled throughout the region (primarily *passive* uses), but for larger regional *active* green spaces with potential to provide sports fields. While Kaka'ako Waterfront Park offers passive recreational uses (such as picnicking, strolling, and jogging), its terrain is too hilly to provide suitable outdoor space for baseball, lacrosse, and other active team sports. The limited availability of land in Kaka'ako will not allow for another regional park to be built in Kaka'ako.

However, it is HCDA's position that the nearby Ala Moana Regional Park is sufficient to meet the future needs of Kaka'ako's growing population. HCDA also recognizes that private landowners may be interested in providing active recreational space in new developments in the form of fitness centers or clubs to supplement existing parks. Contemporary facilities such as these do not rely upon the availability of large open grassed areas. The privately funded Kroc Center in East Kapolei has been immensely successful and offers a good example of a non-traditional active recreational facility.

Operational Impacts: Neither the State HCDA (the primary provider of parks and recreational facilities in Kaka'ako) nor the City DPR currently plans to construct additional parks in or near Kaka'ako, suggesting that impacts on existing public facilities will be confined to those listed at the start of Table 7.8, and other nearby regional facilities. However, HCDA plans to develop a Parks Master Plan that would thoroughly study needs and best ways to meet them. ***Until such a study is completed, recreational impacts remain an "Unresolved Issue."*** Nevertheless, an obvious provisional conclusion is that there is potential for congestion at area public parks and a limited supply to meet public demand within Kaka'ako – particularly in regard to sports fields and playgrounds, a recreational need that has historically not yet been met by requirements for developer contributions.

It is also difficult under present conditions to quantify financial impacts on affected agencies for operations. Even if no new public facilities are provided, as per current

[39] According to the City and County Land Use Ordinance (Chapter 22 §22-7.5), this requirement is to land area specifically dedicated for parks and playgrounds.

[40] Information attributed to DPR is derived from various communications (telephone and written) between JMK Associates and John Reid, staff planner within the City and County of Honolulu's Department of Parks Recreation, November-December 2013.

plans, HCDA believes that population growth in Kaka'ako would result in need for additional parks personnel but would little impact any other portion of the budget. Under such conditions, the need for additional maintenance personnel would likely be marginal rather than directly proportional to area population growth – i.e., even if three times as many people live or stay in Kaka'ako in the future as do today, and no new parks are provided, that would not mean that current parks would require three times the number of maintenance workers. However, HCDA has no way to estimate the required number of additional workers, and JMK Associates could find no reasonable basis for estimates of our own.

Similarly, DPR staff had no estimates of financial impacts on future operational costs (for the Future Baseline or either of the TOD Alternatives) for their current two small Kaka'ako parks. DPR believes that – unless the proposed Kaka'ako Parks Master Plan leads to development of more active public or private recreational facilities – the greater impact of Kaka'ako population growth on public facilities would be increased pressure on nearby Ala Moana Regional Park. Again, DPR had no estimates of cost impacts for either future growth scenario, nor could JMK Associates determine its own basis for estimating cost implications.

Facility Construction Impacts: As previously stated, no additional public parks are planned under either the Future Baseline or either of the proposed TOD Alternatives. Therefore, the current estimated publicly-funded park facility cost impact is $0. Again, though, the social impacts of overcrowded parks and/or lack of active sports on Kaka'ako facilities could be significant.

Also as previously noted, HCDA has plans to develop a Parks Master Plan for Kaka'ako. Part of the intent for such a Plan would be to maximize uses of Kaka'ako Waterfront Park and to provide residents and visitors with more active recreational opportunities within the park. Ideas being entertained for the Waterfront Park include a possible indoor sports facility, as well as outdoor basketball courts. However, nothing can be said at this time regarding cost impacts or funding mechanisms. Developer fees would likely be involved, but whether public taxpayer subsidies would also figure in – or to what extent – is currently unknown.

As a result of a public-private partnership with local developer Stanford Carr Development, LLC (SCD), improvements at the Mother Waldron Neighborhood Park were recently completed (Sept. 2014). The restoration (funded from unutilized private funds from a nearby SCD development) includes a new basketball court and playground, as well as new landscaping and trees, and the restoration of the comfort station and pavilion.

Similarly, in their conceptual planning process, HCDA planners have noted that future redevelopment of the Neil S. Blaisdell Center by its owner, the City and County of Honolulu, could accommodate a sizeable open space area that could be used for park purposes.

Private recreational space, or at least open space, will be built according to HCDA's current standards of 55 SF of green space per one dwelling unit constructed. Private developers will be responsible for managing their own green space. Green space allocation per dwelling unit under these standards is presented here under the Future Baseline Condition as well as the two proposed TOD Alternatives (A and B):

- 12,528 additional units under current Rules – i.e., the Future Baseline Condition – times 55 SF equals 689,024 additional SF of green space (about 16 acres).
- Above and beyond the Future Baseline Condition, build-out of TOD Alternative B would create a further 5,513 units and demand for another 303,228 SF of green space (about 7.0 more acres). This difference is the impact for Alternative B.
- Above and beyond the Future Baseline Condition, build-out of TOD Alternative A would create a further 7,892 units and demand for another 434,084 SF of green space (about 10.0 more acres). This difference is the impact for Alternative A.

More than eight acres of public outdoor recreational space have been proposed in the already approved Howard Hughes Corp.[41] and Kamehameha Schools Master Plans[42] (Table 7.9), representing a substantial but still partial response to the total demand, according to the above standards and calculations for the total additional 16 acres under the Future Baseline Condition, 23 acres under TOD Alternative B, and 26 acres under TOD Alternative A.

Table 7.9: Proposed Public Outdoor Recreation Space

Proposed Public Outdoor Recreation Space from Ward (Howard Hughes) and KS Master Plans	Acres
Ward Neighborhood Central Plaza	3.44
Ward Neighborhood Ewa Plaza	1.00
Ward Neighborhood Diamondhead Plaza	1.00
Park to Park Connection on Cooke Street	2.02
Auahi Street Community Gathering Place	0.57
Total:	**8.04**

7.2.7 Public Infrastructure

Public infrastructure costs for the Future Baseline Condition are found in past HCDA studies cited in Table 7.10, which also shows updated dollar values and a few adjustments explained below. Two other EIS team members – Belt Collins Hawai'i LLC and Nelson\Nygaard Consulting Associates, Inc. – produced separate analyses of Kaka'ako-specific infrastructure impacts, and provided JMK Associates with the following information.

[41] Howard Hughes Corp. *A Vision for Ward*. http://www.avisionforward.com/
[42] Kamehameha Schools Kaka'ako Website. http://www.ourkakaako.com/

City Transportation-Related Costs: For TOD Alternative A (subsequently attributed to Alternative B as well), Nelson\Nygaard estimates total transportation-related "mitigation" costs would be some $14,433,000 in 2015 dollars (roughly $13,331,000 in 2012 dollars). However, most of these consist of required pedestrian improvements that will likely be passed on to developers. Nelson\Nygaard suggests that bicycle-related improvements are most likely to be funded by the City Dept. of Transportation Services (with no cost to the State), as well as the proposed Ala Moana Blvd. "Share Use Path" for pedestrians. They estimate these as totaling $3,178,000 in 2015 dollars (roughly $2,935,000 in 2012 dollars).

Table 7.10: Public Infrastructure Costs for Future Baseline Condition

Mauka[a]	Amount in 2008 Dollars	Amount in 2012 Dollars[d]	2014 Adjustments[e]
Sewer	$49,482,000	$53,938,733	$3,253,120
Water	$5,140,000	$5,602,948	$46,978,873
Water Main Replacement	$249,800	$272,299	
Storm Drain	$6,666,000	$7,266,392	$7,266,392
Street Improvements	$20,780,000	$22,651,608	$22,651,608
Traffic Signalization	$600,000	$654,041	$654,041
Street Lighting	$5,140,000	$5,602,948	$5,602,948
Pavement Patching Repair	$2,538,990	$2,538,990	$2,538,990
Mauka Sub-Total	**$90,596,790**	**$98,527,960**	**$88,945,972**
Makai[b]	**Amount in 2005 Dollars**	**Amount in 2012 Dollars[d]**	**2014 Adjustments[e]**
Water Supply	$1,470,000	$1,854,028	$1,854,028
Waste Water	$2,880,000	$3,632,382	$3,632,382
Roads	$10,520,000	$13,268,284	$13,268,284
Traffic Signals[c]	$87,090	$109,842	$109,842
Street Lighting[c]	$746,110	$941,027	$941,027
Design Fees	$3,400,000	$4,288,229	$4,288,229
Makai Sub-Total	**$19,103,200**	**$24,093,790**	**$24,093,790**
Total Kaka'ako	**$109,699,990**	**$122,621,750**	**$113,039,762**

[a] M&E Pacific, Inc. 2009. "Kakaako Community Development District Mauka Area Infrastructure Plan." Appendix E, Vol. III, *Final Supplemental Environmental Impact Statement, Draft Mauka Area Plan.* Prepared by EDAW, Inc. for HCDA. Pp. 16-1 to 16-10. Also contains cost estimates for Electrical, Telephone, and Cable TV not included here because not taxpayer-funded, but used to estimate some Makai costs.

[b] HCDA. 2005. *Kakaako Community Development District Makai Area Development Plan.* P. 43. Original showed a total (no breakdown) 2005 figure of $8.6M in (2005 $s) for "Power, Communications, Street Lighting, Traffic Controls."

[c] Separate costs for these items estimated from the original $8.6M by percentages of similar total in 2009 Mauka Area Infrastructure Plan above.

[d] Calculated by JMK Associates, Inc., using Honolulu Consumer Price Index (CPI).

[e] 2014 Adjustments (in orange-shaded cells) provided by Belt Collins Hawai'i based on consultations with City agencies, and converted to 2012 $s by JMK Associates, using Honolulu CPI. Large differences between 2009 EIS and 2014 adjustments for Water and, particularly, Sewer are explained in Belt Collins report for this EIS.

Water and Sewer (Wastewater): Based on discussions with City agencies, Belt Collins provided (a) the adjusted Future Baseline figures highlighted in Table 7.10; and (b) estimated additional infrastructure costs for each of the two TOD Alternatives (though these numbers proved identical). These estimated costs (all adjusted to 2012 dollars) are shown in the following summary Table 7.11 for Alternative B and Table 7.12 for Alternative B. (Both tables also show the Nelson\ Nygaard "Transportation Improvements" figure under "Infrastructure – City and County of Honolulu Agencies.")

7.2.8 Summary of Kaka'ako-Specific Costs

Table 7.11 and Table 7.12 summarize foregoing cost information, and also provide estimates of direct construction job-years associated with Kaka'ako-specific facility/ infrastructure impacts. Again, many of these costs will be incurred wherever else on O'ahu (outside Kaka'ako) that future growth in population and/or economic activity would occur under the Future Baseline Condition. The following Section 7.3 considers the net islandwide public costs attributable just to the growth-*inducing* aspects of the TOD Alternatives, as opposed to the growth-*capturing* aspects primarily analyzed here.

Table 7.11: Summary, Kaka'ako-Specific Cost Impacts of TOD Alternative B

	One-Time Construction, Equipment		Annual Operations	
	Nature of Cost	Amount	Nature of Cost	Amount
FACILITIES				
City and County of Honolulu Agencies				
Fire Department	Second fire station, 2 trucks	$10,500,000	Additional Personnel	$2,618,240
Police Department	(None)	$0	- Additional Personnel	$907,472
			- Field Office Rent	$30,000
Emergency Services	(None)	$0	(None)	$0
Public Health[a]	(None, mostly private services)	$0	(None)	$0
Parks & Recreation[a]		$0	(None)	$0
Total Facilities Cost:		**$10,500,000**	**Total Operations Cost:**	**$3,555,712**
Associated Direct Construction Job-Year Impact:		**35**		**(annually)**
State of Hawaii Agencies				
Dept. of Education	Share of New Schools	$122,658,014	Personnel, other support	$10,903,680
HCDA, DLNR Parks	(None)	$0	(None)	$0
Total Facilities Cost:		**$122,658,014**	**Total Operations Cost:**	**$10,903,680**
Associated Direct Construction Job-Year Impact:[b]		**155**		**(annually)**
INFRASTRUCTURE				
City and County of Honolulu Agencies				
Transportation Services	Transportation Improvements	$2,935,301		
Bd. of Water Supply	Water System	$0		
Environmental Services	Wastewater System	$1,052,480	**Note: Construction job numbers in this table add up to sum shown in foregoing Table 6.5, final column for "Infrastructure and Public Facilities."**	
Total Infrastructure Cost:		**$3,987,780**		
Associated Direct Construction Job-Year Impact:		**24**		
State of Hawaii Agencies				
(None affected)[a]	(None)	$0		
Total Infrastructure Cost:		**$0**		
Associated Direct Construction Job-Year Impact:		**0**		

[a] Despite lack of currently identifiable costs, broad issues about adequacy of health and recreational services -- at both City and State levels – were raised by some agency interviewees. Park costs considered Unresolved Issue.

[b] Though DOE cost figures here include Land Acquisition, job estimates based on Construction costs only.

Table 7.12: Summary, Kaka'ako-Specific Cost Impacts of TOD Alternative A

	One-Time Construction, Equipment		Annual Operations	
	Nature of Cost	Amount	Nature of Cost	Amount
FACILITIES				
City and County of Honolulu Agencies				
Fire Department	Second fire station, 2 trucks	$10,500,000	Additional Personnel	$2,618,240
Police Department	(None)	$0	- Additional Personnel	$1,228,529
			- Field Office Rent	$30,000
Emergency Services	(None)	$0	(None)	$0
Public Health[a]	(None, mostly private services)	$0	(None)	$0
Parks & Recreation[a]	(None)	$0	(None)	$0
Total Facilities Cost:		**$10,500,000**	**Total Operations Cost:**	**$3,876,769**
Associated Direct Construction Job-Year Impact:		**35**		**(annually)**
State of Hawaii Agencies				
Dept. of Education	Share of New Schools	$176,275,610	Personnel, other support	$15,670,015
HCDA, DLNR Parks	(None)	$0	(None)	$0
Total Facilities Cost:		**$176,275,610**	**Total Operations Cost:**	**$15,670,015**
Associated Direct Construction Job-Year Impact:[b]		**222**		**(annually)**
INFRASTRUCTURE				
City and County of Honolulu Agencies				
Transportation Services	Transportation Improvements	$2,935,301		
Bd. of Water Supply	Water System	$0		
Environmental Services	Wastewater System	$1,052,480	**Note: Construction job numbers in this table add up to sum shown in foregoing Table 6.6, final column for "Infrastructure and Public Facilities."**	
Total Infrastructure Cost:		**$3,987,780**		
Associated Direct Construction Job-Year Impact:		**24**		
State of Hawaii Agencies				
(None affected)[a]	(None)	$0		
Total Infrastructure Cost:		**$0**		
Associated Direct Construction Job-Year Impact:		**0**		

[a] Despite lack of currently identifiable costs, broad issues about adequacy of health and recreational services -- at both City and State levels – were raised by some agency interviewees. Park costs considered Unresolved Issue.

[b] Though DOE cost figures here include Land Acquisition, job estimates based on Construction costs only.

7.3 Islandwide Impacts

This section begins a transition in this report to studying the *net islandwide impacts* of the TOD Alternatives (A or B). As explained in the report's opening chapters (Sections 1.6 and 2.5), these effects are less than the Kaka'ako-specific impacts, because incremental residential population growth in Kaka'ako resulting from the TOD Alternatives would likely occur somewhere on the island under either TOD Alternative A or Alternative B.

The primary component of either TOD Alternative considered to be "net new islandwide impacts" would be the three hotels, along with the visitor population and associated islandwide employment and dependents of employees supported by visitor expenditures. Associated public costs set forth here are also islandwide impacts.

As will be established in the following Chapter 8, Section 8.2.2, the combined resident and visitor de facto islandwide population impact is estimated for TOD Alternative A as 7,423 average daily population (2,364 new Kaka'ako hotel guests or part-time residents, with the rest comprised of worker households distributed throughout the island). For TOD Alternative B, the comparable figures are 6,768 total (including 2,106 hotel guests or part-time residents). These are conservative numbers for establishing islandwide public service impacts, because they assume that residential workers and dependents represent entirely new or "created" population – in reality, some of the residential population might already be on-island but simply "maintained" by expanded employment opportunities.

All statements in this section flow from the same agency sources and procedures described above for Kaka'ako-specific impacts. A more concise format is possible because the Future Baseline Condition need not be addressed. It involves zero hotels and a fixed base level of part-time visitors. Impacts on public services and facilities can be directly derived from the dwelling unit or population impacts of each TOD Alternative (calculated in the following Chapter 8), and these would be dispersed islandwide.

7.3.1 Public Safety – Fire Department

Operational Impacts: For TOD Alternative A, according to the HFD, the additional net islandwide population would generate a need for three additional on-duty firefighters (nine total, to cover all shifts), one support staff, and probably no new equipment. At current average salaries, the annual additional personnel cost would be a little under $820,000. The same impact is conservatively assumed for TOD Alternative B

Facility Construction Impacts: For both proposed Alternatives, none would be required due just to the limited operational impacts described above. It should of course be acknowledged – for all public agencies discussed in this section – that small population increases from any one project contribute over time to new facility and infrastructure needs, but it may still be correctly stated that this particular project will have a negligible effect on such demand.

7.3.2 Public Safety – Police Department

Operational Impacts: Applying the previously described ratio of 8.9 officers per 10,000 de facto population (with average cost of $96,000 each for salaries plus support costs) to the projected de facto populations calculated in the following Chapter 8, the net islandwide impact at full build-out would be about 6.0 additional police offers and $578,000 additional personnel costs annually for TOD Alternative B. For TOD Alternative A, it would be about 6.6 additional officers and $634,000 additional personnel cost annually.

Facility Construction Impacts: HPD does not project any facility construction need due to islandwide impacts of TOD Alternative A, and the slightly lower-impact TOD Alternative B would logically not create any facility construction needs either.

7.3.3 Public Health – Emergency Services

Operational Impacts: According to City budget documents, the total actual FY2012 EMSD budget was $24,181,985. Dividing this number by the 2012 de facto population of 1,019,156 yields a per-capita service cost of $23.73. For TOD Alternative B, that number times the de facto population increase of 6,768 produces about $161,000 in 2012 dollars. For Alternative A, $23.73 times a de facto population increase of 7,423 generates an annual impact of about $176,000 in 2012 dollars. Again, this difference in estimates is not meaningful in any practical terms.

Facility Construction Impacts: Given the relatively small islandwide population increase, this would be zero for either of the proposed Alternatives.

7.3.4 Public Health – Hospitals and Health Care Facilities

Operational Impacts: As discussed previously in Section 7.3.4, the overall Hawai‘i health care system is currently stressed due to a number of factors. Any resident or visitor population growth at all will definitely add to that stress. However, the net islandwide growth attributable to either TOD Alternative A or Alternative B is unlikely to be significant, relative to overall population growth trends.

Facility Construction Impacts: No Kaka‘ako-specific facility construction impacts are anticipated, and the net islandwide de facto population growth from either alternative is not sufficient to require any specific facility construction elsewhere on the island.

7.3.5 Education

Operational Impacts: As with other agencies, it is assumed that the Kaka‘ako-specific operational impacts are *not* part of the net islandwide impacts, because the TOD Alternatives do not cause creation of housing or population on O‘ahu that would not otherwise take place – it would simply attract more of it to Kaka‘ako.

For purposes of this analysis, the relevant project impacts that would affect public education would consist of an estimated 5,354 full-time residents directly or indirectly supported by jobs associated with new hotels and part-time residents in Kaka‘ako under TOD Alternative A (4,934 under TOD Alternative B), and conservatively assumed not to be part of the island’s population base under the Future Baseline Condition. (See calculations in subsequent Table 8.3.) These residents would be distributed throughout the island.

Given an assumed average household size of 2.95 (see Figure 2.3), this implies 1,816 O‘ahu households created or maintained under TOD Alternative A, and 1,673 households under Alternative B. The procedure for estimating student counts involves application of DOE multipliers, as was done in the Kaka‘ako-specific analysis (see preceding Table 7.4). However, the multipliers used there were specifically for multi-

family units in urban Honolulu, and DOE multipliers for other unit types and/or other locations tend to be higher. Because DOE has no generic islandwide average multipliers, JMK Associates (with tentative concurrence of DOE) has boosted the multipliers used in Table 7.4 by 15% to approximate an islandwide average, though has retained the same estimated per-student cost. With these assumptions, the islandwide operational impacts equate to an additional 353 students and $4.18 million annual operational cost for TOD Alternative A and 325 students and $3.85 million for TOD Alternative B (see Table 7.13).

Table 7.13: Islandwide Operational Impacts on Schools

Islandwide Impact on Schools, by Alternative		Adjusted Student Generation Rates	Islandwide Students Generated	Average Per-Student Cost	Total Annual Impact
TOD Alternative B	Elementary	0.094	158		
	Middle	0.038	63		
	High	0.062	104		
	Total:		**325**	**$11,854**	**$3,852,016**
TOD Alternative A	Elementary	0.094	171		
	Middle	0.038	69		
	High	0.062	113		
	Total:		**353**	**$11,854**	**$4,181,465**

Facility Construction Impacts: The logic used by DOE and the logic used elsewhere in this analysis for other agencies differ. Other agencies did not assume the relatively small net islandwide population impacts would generate facility costs of any magnitude that could be calculated.

However, the DOE (and the foregoing analysis in Section 7.2.5) uses average multipliers per dwelling unit in Kaka‘ako, and so the islandwide analysis here will follow suit. However, the multipliers for this purpose are associated just with units producing the 353 new students (TOD Alternative A) and 325 new students (Alternative B) in Table 7.13.

Exact DOE multipliers for dwelling units change according to location and unit type – both of which are unknown for the islandwide population and housing unit impacts. As per discussion with DOE, JMK Associates in the following Table 7.14 uses the same construction cost multipliers previously used in Table 7.7 for Kaka‘ako-specific calculations, but reduces the land cost multipliers by an estimated 15% to recognize lower land costs outside the urban core. Table 7.14 suggests an islandwide facility cost impact of about $34 million for TOD Alternative B and nearly $37 million for TOD Alternative A.

Table 7.14: Islandwide School Facility Costs (DOE Multipliers)

ALTERNATIVE B: IMPACT (DIFFERENCE)	Construction Cost	Land Cost	Combined Cost
Change in Units over Future Baseline	*1,672*	*1,672*	*1,672*
Elementary[a]	$4,636,456	$7,069,049	$11,705,505
Middle[b]	$2,335,784	$2,094,849	$4,430,633
High[c]	$6,005,824	$11,832,911	$17,838,735
Total:	***$12,978,064***	***$20,996,809***	***$33,974,873***
ALTERNATIVE A: IMPACT (DIFFERENCE)	**Construction Cost**	**Land Cost**	**Combined Cost**
Change in Units over Future Baseline	*1,815*	*1,815*	*1,815*
Elementary[a]	$5,032,995	$7,673,639	$12,706,634
Middle[b]	$2,535,555	$2,274,014	$4,809,569
High[c]	$6,519,480	$12,844,937	$19,364,417
Total:	***$14,088,030***	***$22,792,589***	***$36,880,619***
[a] Elementary construction and land multipliers:	$2,773	$4,228	**Source:** DOE,
[b] Middle school construction and land multipliers:	$1,397	$1,253	DOE/JMK Assoc.
[c] High School construction and land multipliers:	$3,592	$7,077	Land Multipliers

7.3.6 Parks and Recreation

Operational Impacts: Islandwide operational cost impacts for parks and recreation are borne primarily by the City DPR, but potentially also by the State Parks Division of the State DLNR.

According to DPR staff, additional net islandwide population would naturally mean more people will use O‘ahu parks. However, DPR was unable to determine how this increase in use would generate the need for additional personnel, increase the need for park maintenance and thus impact the overall operating cost.

JMK Associates developed its own rough assumptions for these operational cost impacts. First, we assume the small magnitude of the net islandwide population increase would generate limited overall operational impact, primarily cost for additional personnel. We then assume these personnel impacts would be similar to those for the Honolulu Fire Department, an agency with roughly the same number of funded positions for Fiscal Year 2012 (although HFD salaries are higher than those for DPR). Note that this is a conservative assumption, because the HFD estimate of additional personnel needed for the islandwide population impact exceeded that of the much larger Honolulu Police Dept.

First, we adapted the HFD’s assumption of ten total additional personnel needed for the islandwide population increase under either TOD Alternative A or B. DPR’s FY2012 budget [43] was then used to calculate the cost of adding these additional City workers, by dividing the amount authorized for salaries ($38,039,036) by the authorized number of positions at DPR (1,157.65). This results in a cost per worker of $32,859. The cost impact for both TOD Alternative A and B would thus be about $328,590.

[43] City and County of Honolulu. *Departmental and Agency Reports of the City and County of Honolulu for Fiscal Year July 1, 2011 to June 30*. http://www1.honolulu.gov/csd/wholebook.pdf.

Small net islandwide operational impacts on State parks would fall to the DLNR’s State Parks Division rather than HCDA, whose responsibilities are largely confined to Kaka‘ako. The Director of the State Parks Division said the small estimated increase in net islandwide population is not likely to impact on State parks located on O‘ahu. He noted that “State Parks, unlike County Parks, aren't created based on population, rather they are natural or cultural resource based.” [44]

Facility Construction Impacts: Islandwide facility costs would be attributable to any additional facility costs due to net islandwide population increase. However, the net islandwide population increase is sufficiently small that this second component is likely to be zero for both Alternatives.

7.3.7 Public Infrastructure

Incremental islandwide population increase related to the three hotels and additional part-time residents under either TOD Alternative A or B is not seen as likely to strain public infrastructure. While cumulative impacts of small increments of population eventually create do create infrastructure needs, the population levels assessed here are sufficiently small that the cost may be appropriately be equated to $0.

7.3.8 Summary of Islandwide Costs

Table 7.15 and Table 7.16 summarize foregoing cost information, and also provide estimates of direct construction job-years associated with islandwide facility/ infrastructure impacts.

[44] Email Communication with Dan Quinn, Director, DLNR, Division of State Parks. Oct. 14, 2013.

Table 7.15: Summary, Islandwide Cost Impacts of TOD Alternative B

	One-Time Construction		Annual Operations	
	Nature of Cost	Amount	Nature of Cost	Amount
FACILITIES				
City and County of Honolulu Agencies				
Fire Department	(None)	$0	Additional personnel	$818,200
Police Department	(None)	$0	Additional personnel	$578,277
Emergency Services	(None)	$0	Personnel, operations	$160,610
Parks & Recreation[a]	(None)	$0	Additional personnel	$328,588
Total Facilities Cost:		**$0**	**Total Operations Cost:**	**$1,885,675**
Associated Direct Construction Job-Year Impact:		**0**		**(annually)**
State of Hawaii Agencies				
Dept. of Education	Share of New Schools	$33,974,873	Personnel, other support	$3,852,016
DLNR Parks	(None)	$0	(None)	$0
Total Facilities Cost:		**$33,974,873**	**Total Operations Cost:**	**$3,852,016**
Associated Direct Construction Job-Year Impact:[b]		**48**		**(annually)**
INFRASTRUCTURE				
City and County of Honolulu Agencies				
(None affected)	(None)	$0		
Total Infrastructure Cost:		**$0**	**Note: Construction job impacts here are also reflected in the subsequent Table 8.1, column for "State Facilities" through "County Infrastructure."**	
Associated Direct Construction Job-Year Impact:		**0**		
State of Hawaii Agencies				
(None affected)	(None)	$0		
Total Infrastructure Cost:		**$0**		
Associated Direct Construction Job-Year Impact:		**0**		

[a] City Parks & Recreation figures represent JMK Associates assumptions, as detailed in text.

[b] Though DOE cost figures here include Land Acquisition, job estimates based on Construction costs only.

Table 7.16: Summary, Islandwide Cost Impacts of TOD Alternative A

	One-Time Construction		Annual Operations	
	Nature of Cost	Amount	Nature of Cost	Amount
FACILITIES				
City and County of Honolulu Agencies				
Fire Department	(None)	$0	Additional personnel	$818,200
Police Department	(None)	$0	Additional personnel	$634,212
Emergency Services	(None)	$0	Personnel, operations	$176,145
Parks & Recreation[a]	(None)	$0	Additional personnel	$328,588
Total Facilities Cost:		**$0**	**Total for Operations**	**$1,957,146**
Associated Direct Construction Job-Year Impact:		**0**		**(annually)**
State of Hawaii Agencies				
Dept. of Education	`	$36,880,619	Personnel, other support	$4,181,465
DLNR Parks	(None)	$0	(None)	$0
Total Facilities Cost:		**$36,880,619**	**Total Operations Cost:**	**$4,181,465**
Associated Direct Construction Job-Year Impact:[b]		**52**		**(annually)**
INFRASTRUCTURE				
City and County of Honolulu Agencies				
(None affected)	(None)	$0		
Total Infrastructure Cost:		**$0**	**Note: Construction job impacts here are also reflected in the subsequent Table 8.2, column for "State Facilities" through "County Infrastructure."**	
Associated Direct Construction Job-Year Impact:		**0**		
State of Hawaii Agencies				
(None affected)	(None)	$0		
Total Infrastructure Cost:		**$0**		
Associated Direct Construction Job-Year Impact:		**0**		

[a] City Parks & Recreation figures represent JMK Associates assumptions, as detailed in text.

[b] Though DOE cost figures here include Land Acquisition, job estimates based on Construction costs only.

8. RESULTS: ISLANDWIDE ECONOMIC IMPACTS

This chapter provides estimates of islandwide impacts. As discussed in the foregoing chapter on "Methods and Assumptions" (particularly Section 1.6), islandwide impacts are actually substantially *smaller* than Kakaʻako-specific impacts, because they are based only on project elements that are assumed not to occur somewhere on the island – whether in Kakaʻako or elsewhere – if transit-oriented development is not implemented in Kakaʻako:

- Construction and operation of three hotels (illustrative hotel types including a full-service hotel for travelers desiring to stay outside Waikīkī, a business-oriented hotel; and a condo-hotel);
- Initial expenditures by an increased number of part-time residents to furnish and accessorize units, as well as large purchases by some for automobiles (these initial one-time expenditures counted along with construction impacts) and ongoing average annual expenditures by part-time residents (counted with operational impacts);
- Construction of additional government public facilities and/or infrastructure required by population growth and development associated with the above factors.

Islandwide impacts thus represent a simpler situation, and consequently this chapter differs from earlier chapters on Kakaʻako-specific impacts as follows:

1. Construction and operational impacts are both contained here in the same chapter.
2. The calculations can be more fully shown in straightforward tables that include assumptions and intermediate steps – something that could not be readily done for Kakaʻako-specific results summing up hundreds of individual calculations (some of which included logical "If-Then" commands and not just multiplication, addition, etc.).
3. Rather than calculating overall results separately for the Future Baseline Condition and each TOD Alternative, and *then* subtracting to get impacts, the simpler analysis here *begins* with the difference (impact) in direct output for each element, and then applies multipliers to determine associated impacts such as islandwide employment, earnings, etc. This procedure yields mathematically identical results but is more succinct. Most of the difference flows from TOD components – Future Baseline values would all be zero, except for some part-time resident spending.

8.1 Construction-Related Islandwide Economic and Population Impacts

Islandwide construction impacts flow from development of three hotels and the various public facilities and infrastructure increments discussed in Chapter 7, along with initial expenditures by part-time residents to prepare their new homes for occupancy.

8.1.1 Methods and Caveats

A full and detailed explanation of methods and assumptions was provided earlier in Section 2.6, which explains the difference in "direct" versus "total" impacts and also discusses the very rough and preliminary nature of the component dealing with part-time residents' initial expenditures. It further notes that these are cumulative results over time for the difference in full build-outs of both scenarios.

Also as noted there, economic and population impacts should be interpreted as economic effects "created or maintained" – if no other part of the economy is in decline, these would be money, jobs, and population *in addition* ("created") to then-current levels, but if some other economic activity is fading, the results show the money, jobs, and population *preserved* ("maintained") by the project, on a net islandwide basis.

8.1.2 Results

Table 8.1 and Table 8.2 show the calculation process and results. Each begins with the key inputs of dollars spent in the Hawaiʻi economy. For hotels, these were calculated by methods and assumptions set forth in Chapter 2, Section 2.4. For public facilities and infrastructure, they reflect figures from Chapter 7. For part-time resident initial spending, they were calculated by methods and assumptions set forth in Section 2.6. The tables show the multipliers used from the Hawaiʻi Inter-County Input-Output (I-O) Model, and also show some interim results used in the following Chapter 9 analysis of government cost-revenue fiscal impacts.

Output (Economic Activity): Due to the circulation of money through the economy (multiplier or "ripple" effects), for Alternative B, the initial direct output increment of about $235 million would result in a total $496 million in overall sales, payments, and exchanges (i.e., that much *more* under Alternative B than the Future Baseline Condition). For Alternative A, the total statewide economic impact is $474 million.

Earnings: Of this additional economic activity, for Alternative B, about $75 million would be for direct household earnings of construction workers, supporting professionals, and retailers. With the multiplier effects, the total earnings come to about $150 million. For Alternative A, comparable figures are $73 million and $144 million.

Jobs (Job-years): Full build-out under Alternative B would create or maintain about 960 more job-years of direct employment than would full build-out of the Future Baseline Condition – with multiplier effects, total job-years of employment reaches about 2,660. For Alternative A, comparable figures are about 1,075 and 2,680.

Population Impacts: A relatively small proportion of direct construction workers would likely come from off-island, but the on-island direct workers plus indirect/induced workers would support a total population (themselves and dependents) of about 4,935 at build-out – again, this much *more* created or maintained under TOD Alternative B than under the Future Baseline Condition. For Alternative A, the result is almost the same at nearly 5,010.

Table 8.1: Islandwide Construction Impacts – TOD Alternative B

Change from Future Baseline Condition to TOD Alternative B in Construction Costs	Full-Service Hotel	Business Hotel	Condo-Hotel	State Facilities	County Facilities	State Infrastructure	County Infrastructure	Part-Time Res Initial Spend	Total
Inputs									
Total Construction Cost	$81,267,542	$61,000,453	$67,304,264	$12,978,064	$0	$0	$0	$12,254,116	**$234,804,439**
Hard Costs (94%)	$76,391,489	$57,340,426	$63,266,009	$12,199,380	$0	$0	$0	N/A[1]	
Soft Costs (6%)	$4,876,053	$3,660,027	$4,038,256	$778,684	$0	$0	$0	N/A[1]	
Hard Cost Multipliers	*Sector: Construction of "Other" (Non-Residential) Buildings*					*Sector: Heavy/Civil Construction*		*Sector: Retail*	
Direct Earnings	0.297	0.297	0.297	0.297	0.297	0.297	0.297	0.363	
Direct Jobs/$1M (Mid-2022)	3.588	3.588	3.588	3.588	3.588	6.157	6.157	11.975	
Direct State Taxes	0.069	0.069	0.069	0.069	0.069	0.016	0.016	0.079	
Total (Type II) Output	2.132	2.132	2.132	2.132	2.132	2.146	2.146	1.827	
Total (Type II) Earnings	0.628	0.628	0.628	0.628	0.628	0.643	0.643	0.584	
Total (Type II) Jobs/$1M (Mid-2022)	11.000	11.000	11.000	11.000	11.000	12.000	12.000	17.300	
Total (Type II) State Taxes	0.136	0.136	0.136	0.136	0.136	0.083	0.083	0.125	
Soft Cost Multipliers									
Direct Earnings	0.595	0.595	0.595	0.595	0.595	0.595	0.595	N/A	
Direct Jobs/$1M (Mid-2022)	4.854	4.854	4.854	4.854	4.854	4.854	4.854	N/A	
Direct State Taxes	0.082	0.082	0.082	0.082	0.082	0.082	0.082	N/A	
Total (Type II) Output	2.033	2.033	2.033	2.033	2.033	2.033	2.033	N/A	
Total (Type II) Earnings	0.884	0.884	0.884	0.884	0.884	0.884	0.884	N/A	
Total (Type II) Jobs/$1M (Mid-2022)	11.000	11.000	11.000	11.000	11.000	11.000	11.000	N/A	
Total (Type II) State Taxes	0.139	0.139	0.139	0.139	0.139	0.139	0.139	N/A	
Results for Later Fiscal Analysis									
Direct State Taxes	$5,659,826	$4,248,338	$4,687,363	$903,849	$0	$0	$0	$964,177	**$16,463,554**
Total State Taxes	$11,104,906	$8,335,484	$9,196,876	$1,773,404	$0	$0	$0	$1,526,410	**$31,937,079**
Direct GET to Counties[2]	$406,338	$305,002	$336,521	$64,890	$0	$0	$0	$61,271	**$1,174,022**
Total GET to Counties[2]	$827,865	$621,406	$685,622	$132,206	$0	$0	$0	$111,916	**$2,379,015**
Economic Impacts (Statewide)									
Direct Output	$81,267,542	$61,000,453	$67,304,264	$12,978,064	$0	$0	$0	$12,254,116	**$234,804,439**
Direct Earnings	$25,592,118	$19,209,770	$21,194,915	$4,086,947	$0	$0	$0	$4,450,919	**$74,534,670**
Direct Jobs (Job-Years)	298	223	247	48	0	0	0	147	**962**
Total Output	$172,789,047	$129,697,661	$143,100,670	$27,593,640	$0	$0	$0	$22,383,161	**$495,564,181**
Total Earnings	$52,252,445	$39,221,351	$43,274,502	$8,344,482	$0	$0	$0	$7,150,933	**$150,243,713**
Total Jobs (Job-Years)	894	671	740	143	0	0	0	212	**2,660**
Population Impacts (Person-Years)									
Off-Island Construction Workers[3]	60	45	49	10	0	0	0	N/A	**163**
On-Island Total Workers	834	626	691	133	0	0	0	212	**2,497**
On-Island Total Pop. Supported[4]	1,649	1,238	1,366	263	0	0	0	419	**4,934**

[1] Hard/soft cost distinction not applicable to initial expenditures by part-time residents, though retail multipliers shown in "Hard Cost" multiplier rows for visual convenience. [2] General Excise Tax (GET) calculated as 0.5% of direct of total County output (about 96% of Statewide). [3] Assumed average of 20% of direct construction from off-island. [4] At 1.976 population-to-worker ratio.

Table 8.2: Islandwide Construction Impacts – TOD Alternative A

Change from Future Baseline Condition to TOD Alternative A in Construction Costs	Full-Service Hotel	Business Hotel	Condo-Hotel	State Facilities	County Facilities	State Infrastructure	County Infrastructure	Part-Time Res Initial Spend	Total
Inputs									
Total Construction Cost	$81,267,542	$61,000,453	$41,324,943	$14,088,030	$0	$0	$0	$29,210,276	**$226,891,244**
Hard Costs (94%)	$76,391,489	$57,340,426	$38,845,447	$13,242,748	$0	$0	$0	N/A[1]	
Soft Costs (6%)	$4,876,053	$3,660,027	$2,479,497	$845,282	$0	$0	$0	N/A[1]	
Hard Cost Multipliers	*Sector: Construction of "Other" (Non-Residential) Buildings*					*Sector: Heavy/Civil Construction*		*Sector: Retail*	
Direct Earnings	0.297	0.297	0.297	0.297	0.297	0.297	0.297	0.363	
Direct Jobs/$1M (Mid-2022)	3.588	3.588	3.588	3.588	3.588	6.157	6.157	11.975	
Direct State Taxes	0.069	0.069	0.069	0.069	0.069	0.016	0.016	0.079	
Total (Type II) Output	2.132	2.132	2.132	2.132	2.132	2.146	2.146	1.827	
Total (Type II) Earnings	0.628	0.628	0.628	0.628	0.628	0.643	0.643	0.584	
Total (Type II) Jobs/$1M (Mid-2022)	11.000	11.000	11.000	11.000	11.000	12.000	12.000	17.300	
Total (Type II) State Taxes	0.136	0.136	0.136	0.136	0.136	0.083	0.083	0.125	
Soft Cost Multipliers									
Direct Earnings	0.595	0.595	0.595	0.595	0.595	0.595	0.595	N/A	
Direct Jobs/$1M (Mid-2022)	4.854	4.854	4.854	4.854	4.854	4.854	4.854	N/A	
Direct State Taxes	0.082	0.082	0.082	0.082	0.082	0.082	0.082	N/A	
Total (Type II) Output	2.033	2.033	2.033	2.033	2.033	2.033	2.033	N/A	
Total (Type II) Earnings	0.884	0.884	0.884	0.884	0.884	0.884	0.884	N/A	
Total (Type II) Jobs/$1M (Mid-2022)	11.000	11.000	11.000	11.000	11.000	11.000	11.000	N/A	
Total (Type II) State Taxes	0.139	0.139	0.139	0.139	0.139	0.139	0.139	N/A	
Results for Later Fiscal Analysis									
Direct State Taxes	$5,659,826	$4,248,338	$2,878,050	$981,152	$0	$0	$0	$2,298,321	**$16,065,687**
Total State Taxes	$11,104,906	$8,335,484	$5,646,899	$1,925,077	$0	$0	$0	$3,638,522	**$30,650,887**
Direct GET to Counties[2]	$406,338	$305,002	$206,625	$70,440	$0	$0	$0	$146,051	**$1,134,456**
Total GET to Counties[2]	$827,865	$621,406	$420,973	$143,513	$0	$0	$0	$266,775	**$2,280,532**
Economic Impacts (Statewide)									
Direct Output	$81,267,542	$61,000,453	$41,324,943	$14,088,030	$0	$0	$0	$29,210,276	**$226,891,244**
Direct Earnings	$25,592,118	$19,209,770	$13,013,717	$4,436,489	$0	$0	$0	$10,609,707	**$72,861,801**
Direct Jobs (Job-Years)	298	223	151	52	0	0	0	350	**1,074**
Total Output	$172,789,047	$129,697,661	$87,864,078	$29,953,623	$0	$0	$0	$53,354,998	**$473,659,407**
Total Earnings	$52,252,445	$39,221,351	$26,570,624	$9,058,155	$0	$0	$0	$17,045,760	**$144,148,336**
Total Jobs (Job-Years)	894	671	455	155	0	0	0	505	**2,680**
Population Impacts (Person-Years)									
Off-Island Construction Workers[3]	60	45	30	10	0	0	0	N/A	**145**
On-Island Total Workers	834	626	424	145	0	0	0	505	**2,535**
On-Island Total Pop. Supported[4]	1,649	1,238	838	286	0	0	0	999	**5,009**

[1] Hard/soft cost distinction not applicable to initial expenditures by part-time residents, though retail multipliers shown in "Hard Cost" multiplier rows for visual convenience. [2] General Excise Tax (GET) calculated as 0.5% of direct of total County output (about 96% of Statewide). [3] Assumed average of 20% of direct construction from off-island. [4] At 1.976 population-to-worker ratio.

8.2 Operations-Related Islandwide Economic and Population Impacts

Operational impacts discussed here are on an *annual* basis, and flow entirely from new hotel guest spending and the additional annual expenditures of the incremental part-time resident population (i.e., additional numbers present under either of the TOD Alternatives, A or B, compared to the Future Baseline Condition).

8.2.1 Methods and Caveats

See Chapter 2, Section 2.7 for a detailed discussion of methods and assumptions, including explanation of "Visitor Expenditure" (VE) and "Personal Consumption Expenditure" (PCE) multipliers and caveats about the differences in assumed hotel unit counts. That section also includes preliminary calculations for estimated average daily expenditures, which provide a starting point for this analysis.

Calculations again begin with increments from the Future Baseline to each TOD Alternative, and apply multipliers to these differences. Values for the Future Baseline Condition alone would be zero, except for some part-time resident spending.

8.2.2 Results

Table 8.3 shows how earlier results are combined to estimate change from the Future Baseline Condition to TOD Alternative B in the key input of total annual expenditures. It indicates values of various VE and PCE multipliers from the I-O Model, and indicates interim results used in the following Chapter 9 analysis of fiscal impacts. Table 8.4 does the same for TOD Alternative A.

Output (Economic Activity): After build-out, the project under TOD Alternative B is estimated to generate about $180 million more in direct output annually than under the Future Baseline Condition. With multiplier effects, the difference in total output would be about $324 million, mostly attributable to spending by hotel guests.

For TOD Alternative A, the direct output impact is about $197 million, and total output impact about $351 million. TOD Alternative A thus generates impacts about 8% - 10% higher than TOD Alternative B.

Earnings: Earnings flowing to households would be about $48 million more under TOD Alternative B than under the Future Baseline Condition due to direct visitor and part-time resident expenditures; about $94 million total impact with multiplier effects annually.

Results for TOD Alternative A are again about 8% greater – direct earnings of $52 million and total with multiplier effects of about $101 million annually.

Table 8.3: Islandwide Operational Impacts – TOD Alternative B

Change from Future Baseline to TOD Alternative B	Visitors, Full-Service Hotel	Visitors, Business Hotel	Visitors, Condo-Hotel	Part-Time Residents	Total
Inputs					
Average Daily Population (Change)	685	469	598	354	**2,106**
Total Visitor Days on O'ahu[1]	250,329	171,142	218,333	129,421	**769,226**
Average Daily Expenditure on Oahu[2]	$281.66	$281.66	$195.44	$151.59	
Air Transportation Adjustment	$2.07	$2.07	$1.48	$1.48	
Accommodations Part of Expenditure[2]	$115.00	$115.00	$87.13	$43.30	
Adjusted Average Daily Expenditure	$280	$280	$194	$150	
Total Expenditures on Oahu[3]	$69,989,230	$47,849,553	$42,348,415	$19,426,964	**$179,614,161**
Multipliers		*VE Multipliers*		*PCE Multiplier*	
Direct Earnings	0.273	0.273	0.273	0.233	
Direct Jobs/$1M (Mid-2022)	6.916	6.916	6.916	5.849	
Direct State Taxes	0.073	0.073	0.073	0.043	
Total (Type II) Output	1.836	1.836	1.836	1.558	
Total (Type II) Earnings	0.531	0.531	0.531	0.440	
Total (Type II) Jobs/$1M (Mid-2022)	14.100	14.100	14.100	12.250	
Total (Type II) State Taxes	0.122	0.122	0.122	0.084	
Results for Later Fiscal Analysis					
Direct State Taxes	$5,079,718	$3,472,852	$3,073,588	$845,001	**$12,471,159**
Total State Taxes	$8,549,200	$5,844,833	$5,172,868	$1,624,947	**$21,191,848**
Direct GET to Counties[4]	$338,263	$231,260	$204,021	$97,135	**$870,679**
Total GET to Counties[4]	$600,143	$410,300	$362,477	$141,577	**$1,514,497**
Accommodations Total Subject to TAT[3]	$28,788,924	$19,682,130	$19,024,166	$0	**$67,495,221**
Economic Impacts					
Direct Output	$69,989,230	$47,849,553	$42,348,415	$19,426,964	**$179,614,161**
Direct Earnings	$19,120,737	$13,072,278	$11,550,683	$4,527,218	**$48,270,916**
Direct Jobs	484	331	293	114	**1,222**
Total Output	$128,522,501	$87,867,008	$77,765,169	$30,263,773	**$324,418,451**
Total Earnings	$37,172,843	$25,413,966	$22,492,189	$8,543,452	**$93,622,449**
Total Jobs	987	675	597	238	**2,497**
Population Impacts					
Visitor and Part-Time Resident Population	685	469	598	354	**2,106**
Total Full-Time Resident Pop. Supported by Source of Economic Activity[5]	1,950	1,333	1,180	470	**4,934**
DeFacto Population Impact[6]	2,528	1,728	1,713	799	**6,768**

[1] Avg. daily population times 365.25 days. [2] From preliminary calculations, Table 2.29. [3] Appropriate base expenditure ("adjusted average" for total expenditures, "accommodations part" for total subject to TAT) times avg. daily population times 365.25 days. [4] Effective rate of 0.459% on total hotel room bills, 0.5% on all other expenditures. The 0.5% is applied to total County output (calculated from County-level multipliers -- about 95% of Statewide output). [5] At 1.976 population-to-worker ratio. [6] Visitor population plus 94.5% of resident population.

Table 8.4: Islandwide Operational Impacts – TOD Alternative A

Change from Future Baseline to TOD Alternative A	Visitors, Full-Service Hotel	Visitors, Business Hotel	Visitors, Condo-Hotel	Part-Time Residents	Total
Inputs					
Average Daily Population (Change)	835	469	367	693	**2,364**
Total Visitor Days on O'ahu[1]	305,113	171,142	134,057	252,974	**863,287**
Average Daily Expenditure on Oahu[2]	$281.66	$281.66	$195.44	$151.59	
Air Transportation Adjustment	$2.07	$2.07	$1.48	$1.48	
Accommodations Part of Expenditure[2]	$115.00	$115.00	$87.13	$43.30	
Adjusted Average Daily Expenditure	$280	$280	$194	$150	
Total Expenditures on Oahu[3]	$85,306,312	$47,849,553	$26,002,006	$37,973,036	**$197,130,907**
Multipliers		*VE Multipliers*		*PCE Multiplier*	
Direct Earnings	0.273	0.273	0.273	0.233	
Direct Jobs/$1M (Mid-2022)	6.916	6.916	6.916	5.849	
Direct State Taxes	0.073	0.073	0.073	0.043	
Total (Type II) Output	1.836	1.836	1.836	1.558	
Total (Type II) Earnings	0.531	0.531	0.531	0.440	
Total (Type II) Jobs/$1M (Mid-2022)	14.100	14.100	14.100	12.250	
Total (Type II) State Taxes	0.122	0.122	0.122	0.084	
Results for Later Fiscal Analysis					
Direct State Taxes	$6,191,410	$3,472,852	$1,887,188	$1,651,687	**$13,203,138**
Total State Taxes	$10,420,185	$5,844,833	$3,176,151	$3,176,213	**$22,617,382**
Direct GET to Counties[4]	$412,291	$231,260	$125,269	$189,865	**$958,686**
Total GET to Counties[4]	$731,483	$410,300	$222,562	$276,735	**$1,641,080**
Accommodations Total Subject to TAT[3]	$35,089,355	$19,682,130	$11,680,874	$0	**$66,452,359**
Economic Impacts					
Direct Output	$85,306,312	$47,849,553	$26,002,006	$37,973,036	**$197,130,907**
Direct Earnings	$23,305,293	$13,072,278	$7,092,141	$8,849,156	**$52,318,868**
Direct Jobs	590	331	180	222	**1,323**
Total Output	$156,649,540	$87,867,008	$47,747,958	$59,155,274	**$351,419,780**
Total Earnings	$45,308,087	$25,413,966	$13,810,246	$16,699,512	**$101,231,811**
Total Jobs	1,203	675	367	465	**2,709**
Population Impacts					
Visitor and Part-Time Resident Population	835	469	367	693	**2,364**
Total Full-Time Resident Pop. Supported by Source of Economic Activity[5]	2,377	1,333	724	919	**5,354**
DeFacto Population Impact[6]	3,082	1,728	1,052	1,561	**7,423**

[1] Avg. daily population times 365.25 days. [2] From preliminary calculations, Table 2.29. [3] Appropriate base expenditure ("adjusted average" for total expenditures, "accommodations part" for total subject to TAT) times avg. daily population times 365.25 days. [4] Effective rate of 0.459% on total hotel room bills, 0.5% on all other expenditures. The 0.5% is applied to total County output (calculated from County-level multipliers -- about 95% of Statewide output). [5] At 1.976 population-to-worker ratio. [6] Visitor population plus 94.5% of resident population.

Jobs (Full- and Part-Time): Direct jobs created or maintained by new hotel guest and additional part-time resident spending would be about 1,200 more under TOD Alternative B. (Note that these direct jobs are *islandwide*, because visitor expenditures are not limited to Kaka'ako.) With multiplier effects, the total job impact is estimated at about 2,500 – again, mostly attributable to hotel guest expenditures.

For TOD Alternative A, comparable figures are a bit over 1,300 direct and 2,700 total, impact figures about 8% - 9% greater than for TOD Alternative B.

Population Impacts: Total additional employment would support a full-time resident population of about 4,930 people (workers plus dependents) more under TOD Alternative B than under the Future Baseline Condition. Subtracting average off-island resident population and adding the visitor population, the total de facto population impact would be nearly 6,760.

Results for TOD Alternative A are 9% - 10% higher – about 5,350 resident population and about 7,425 total de facto population.

All of these impact figures – output, earnings, jobs, and population – represent amounts "created *or* maintained," depending on what else is happening in the economy.

9. RESULTS: FISCAL IMPACTS

This chapter provides general estimates of fiscal cost-revenue impacts for two levels of local government – the State and the City and County of Honolulu. The central question for such analyses is simply whether build-out under either TOD Alternative is likely to generate more revenues than costs for each level of government, compared to the cost-revenue balance for build-out under existing HCDA Rules. The answers to this question are subject to ***important caveats discussed in the following Section 9.2***.

However, the chapter first begins with a qualitative discussion about evidence for overall governmental cost savings for concentrated development patterns such as TOD versus dispersed development patterns, and then sets forth quantitative estimates of the impacts of the proposed Alternatives. The quantitative analyses are properly done at the *islandwide* level, and so flow primarily from the results of the previous two chapters rather than the earlier ones on Kaka'ako-specific impacts.

9.1 General Principles of Concentrated Versus Dispersed Development

Among other things, the TOD Alternatives will result in a *population shift* of some 12,800 full-time residents (for Alternative A, or 9,100 for Alternative B) into the Kaka'ako area who would otherwise be living "somewhere else" on O'ahu as of 2035. Though it may reasonably be assumed that many of these people would choose to live in other high-density areas, likely even in other TOD developments around future HART stations, there is no way to know exactly where they would choose to live under the Future Baseline Condition. They would almost certainly not be in a single identifiable alternative location, but would be dispersed to various locations throughout the island. Therefore, it is impossible to quantify government costs – especially facility development costs – associated with accommodating this relatively small population[45] under the Future Baseline Condition.

However, each of the TOD Alternatives are consistent with State and City policies to concentrate much of the island's future growth in Kaka'ako or similar higher-density locations, particularly HART-related TOD. Those policies reflect general principles of reduced governmental costs and other economic benefits.

For governments, economic benefits associated with TOD-style concentrated development patterns include:

- Savings on city infrastructure and public facilities operations and maintenance costs;
- Increases in municipal revenues;
- Increased property values;
- Lower transportation costs;
- Promotion of local economic development; and
- Savings on health care.

[45] The Hawai'i State DBEDT Long-Range Forecasts a 2035 O'ahu population of 1,071,221. The population shift would thus involve roughly 1% of the island's total number of full-time residents.

Recent studies[46] have shown that "growth focused in existing urban areas takes advantage of existing infrastructure and capitalizes on the efficiencies of providing service to higher concentrations of jobs and housing."[47] The studies indicate that more dispersed development require more lengthy roads, greater sewer and water systems infrastructure, and generally incur larger operations and maintenance costs than compact development. TOD is able to maximize infrastructure capacity, and keep overall costs down.

Public facilities and services are also more efficient in TOD, where development is more compact by promoting quicker response times for such services as police and fire on a smaller footprint. School grounds in TOD are also more compact,[48] thus decreasing overall operating and maintenance costs. Denser locations (such as TOD), and close proximity to major transit systems are also reported as supporting higher property values. Because of this, compact development typically generates higher local revenues than more dispersed development.

Compact development can help generate revenue for the private sector as well. It is reported that, "Projects near transit are viewed as having the potential to achieve faster absorption rates, higher occupancy rates, and in some cases higher sales prices or rents".[49] Because TOD supports greater proximity to transit, work, shopping and recreational uses, TOD residents also enjoy lower transportation costs, which results in greater overall affordability for households. Additionally, TOD projects have the potential to generate enhanced economic activity related to new construction, neighborhood urban revitalization; thus promoting local economic development. Finally, TOD can help reduce the cost of medical care and impact on local medical facilities, by promoting healthier lifestyles, encouraging walking and biking, and allowing residents enjoy the health benefits associated with reduced energy consumption, which reduce greenhouse gas emissions and air pollution.

9.2 Methods and Caveats for Quantitative Analysis

It is important to reiterate that results of this analysis focus on the net new *islandwide* components largely common to each TOD Alternative – i.e., three new hotels and an increment in the part-time resident population – plus construction of public facilities and infrastructure (whether in Kaka'ako or elsewhere on island) assumed to occur only due to the TOD Alternatives. There will be many public expenditures required, and revenues

[46] Examples include (a) The Pacific Resource Partnership (PRP) and Calthorpe Associates (2013). *Honolulu Transit Oriented Development Study Scenarios*. http://www.calthorpe.com/files/Honolulu%20TOD%20Scenarios%20Report.pdf;(b) Center for Transit Oriented Development (2011). *Rails to Real Estate Development Patterns along Three New Transit Lines*. http://ctod.org/pdfs/2011R2R.pdf; and c) Goetz, E.G. et al. (2010). *The Hiawatha Line: Impacts on Land Use and Residential Housing Value*. University of Minnesota Center for Transportation Studies. CTS Report 10-09.
[47] PRP and Calthorpe Associates, *op. cit.*, p. 16
[48] Some urban schools now share athletic fields at sites remote from each location.
[49] Center for Transit Oriented Development (2011), *op. cit.*, p. 2.

raised, in Kaka'ako as a result of the TOD Alternatives that will also be generated no matter where on O'ahu that new residential and commercial demand is accommodated.

Because the methods underlying this analysis yield results that appear very precise, it is also useful to remind the reader that all the input to this analysis stem from assumed "scenarios" of possible ways that Kaka'ako might build out under existing Rules (Future Baseline Condition) and or proposed TOD Alternatives (A or B). Like every other analysis in this report, the following fiscal cost-revenue calculations are actually *illustrative and indicative* of potential outcomes – not calculations of specific known proposals that developers/landowners have stated firm intentions to carry out.

Furthermore, the ***islandwide inputs to the analysis are very similar, meaning the results will be very similar.*** This chapter will present separate results for each Alternative, but will also point out their practical equivalence.

Beyond this general sense of testing the changes in two *very* hypothetical long-term realities, this cost-revenue analysis is constrained by key uncertainties related both to assumed costs and assumed revenues.

Government Cost Uncertainties: Chapter 7, the analysis of "Public Services and Facilities," pointed out several concerns about costing future facility construction and operations for Kaka'ako and urban Honolulu in general –

- While no new publicly-funded Kaka'ako park or recreational facilities are proposed as of this writing, the additional population expected under *either* scenario will greatly impact existing/nearby facilities. HCDA is planning a study of likely recreational needs and solutions that *might* result in more taxpayer-funded facilities. Whether such taxpayer-supported facilities will actually be developed, and whether or to what extent costs would be higher due to either of the TOD Alternatives, remains an Unresolved Issue as of this writing. It is probably the most critical of the issues noted in this short series of bullet points.

- Similarly, Hawai'i in general faces challenges to provision of enough public health facilities – private or public – as the population grows. While either one of the TOD Alternatives is highly unlikely to determine the nature of the final response to these challenges, it should be remembered that some additional public expenditures are likely to be needed under any of the scenarios, including the Future Baseline.

Furthermore, as discussed in the relevant methodology Section 2.8, government costs and revenues – for both services and for capital expenditures – generally balance out for residential population increases, and so this analysis estimates service costs only for transient populations and includes no averaged capital costs. However, as a strongly conservative step, islandwide service and facility costs (particularly DOE facility costs) are included if they were attributed by the agencies to this project. It is not clear that this is appropriate, since it could be viewed as double-counting, but these costs *will* be included, albeit subject to comment about their overall effect on results.

Government Revenue Uncertainties: All revenues cited in this analysis come from standard tax sources typically associated with the sorts of costs that have been listed. However, the HCDA is an atypical agency – it is a *development authority* with the powers to set or negotiate impact fees. That means it is possible that some currently unknown amount of revenues will come not from overall taxpayers, but initially from developers and ultimately from residential or commercial purchasers/lessees.

HCDA is exploring various "value capture" mechanisms by which it might gain additional revenues from landowners, developers, etc. Depending on whether and how such mechanisms are employed, the illustrative fiscal cost-revenue analysis in this chapter could turn out very differently.

Beyond the foregoing caveats and uncertainties … the full methodology, including explanation of assumed multipliers, is to be found in the foregoing Chapter 2, Section 2.8. As noted there, analysis for each level of government must be divided into:

1. The Construction phase, which for this analysis involves the *cumulative* effects of all construction over time; and

2. The Operational phase, which is properly assessed at a representative point-in-time *annual* basis.

In a standard fiscal cost-revenue analysis, results of both phases would be presented together in a single table for each TOD Alternative by year, with cumulative figures indicating points in time when any negative balance for Construction might be eventually offset by potential positive balances for Operations. That is not possible for this sort of hypothetical analysis with unclear timeframes, but the textual interpretation of the tables will note when and if such offsetting results are found.

As with other islandwide analyses, this analysis reflects inputs that are already "impacts" (i.e., differences between each of the TOD Alternatives and the Future Baseline Condition), and then calculates results from those. This generates results identical to those that would flow from the more cumbersome procedure of separately calculating Future Baseline Condition and TOD Alternative results, and then subtracting.

9.3 Construction Phase

9.3.1 State Results

The upper parts of Table 9.1 and Table 9.2 indicate that construction elements, in and of themselves, would result in about a $2.3 million net revenue *loss* for the State for TOD Alternative B and a larger $6.5 loss for Alternative A. The private-sector portions of the equation (hotels and part-time residential population) generate overwhelmingly

positive returns. However, these are substantially though not entirely offset by the very conservative inclusion of DOE public school costs for land acquisition and construction.

In an analysis of this nature, these apparent net losses are actually relatively small and fairly similarly. Perhaps more importantly, ***they would be offset by considerably larger annual Operational phase positive balances*** (see following Section 9.4.1) at build-out. As will be seen, just one year's net Operational positive balance for State government would wipe away the calculated loss from the Construction phase under either TOD Alternative A or B.

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9.3.2 County Results

The lower parts of Table 9.1 and Table 9.2 show modest positive balances of a little over $2 million each for the City and County of Honolulu for TOD Alternatives B and A, respectively. This is in part because of the assumption that County revenues are limited to a modest share of the General Excise Tax (GET).

It also reflects the very small County costs *or* revenues that can be directly associated with this very marginal addition to a much larger directed growth strategy. In the "bigger picture," as per studies reviewed in the foregoing Section 9.1, concentrated development on average is more cost-effective for municipal governments than is dispersed development.

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Table 9.1: State and County Fiscal Cost-Revenue Impacts – Construction Phase – TOD Alternative B

Costs/Revenues Flowing from Change from Future Baseline to TOD Alternative B in Construction Costs (Cumulative)									
	Full-Service Hotel	Business Hotel	Condo-Hotel	State Facilities	County Facilities	State Infra-structure	County Infra-structure	Part-Time Resident Initial Expenditures	TOTAL
State Costs									
Total State Facility, Infrastructure Costs[1]				$33,974,873		$0			$33,974,873
Service Cost, Off-Island Constr. Workers[2]	$90,422	$67,872	$74,885	$14,440	$0	$0	$0		$247,619
Total State Costs	***$90,422***	***$67,872***	***$74,885***	***$33,989,313***	***$0***	***$0***	***$0***		***$34,222,491***
State Revenues									
Total State Tax Revenues[3]	***$11,104,906***	***$8,335,484***	***$9,196,876***	***$1,773,404***	***$0***	***$0***	***$0***	***$1,526,410***	***$31,937,079***
State Revenues Minus Costs	**$11,014,484**	**$8,267,612**	**$9,121,990**	**-$32,215,909**	**$0**	**$0**	**$0**	**$1,526,410**	**-$2,285,412**
County Costs									
Total County Facility, Infrastructure Costs[1]					$0		$0		$0
Service Cost, Off-Island Constr. Workers[2]	$56,285	$42,248	$46,614	$8,989	$0	$0	$0		$154,137
Total County Costs	***$56,285***	***$42,248***	***$46,614***	***$8,989***	***$0***	***$0***	***$0***		***$154,137***
County Revenues									
Total County Revenues (GET only)[3]	***$827,865***	***$621,406***	***$685,622***	***$132,206***	***$0***	***$0***	***$0***	***$111,916***	***$2,379,015***
County Revenues Minus Costs	**$771,579**	**$579,157**	**$639,008**	**$123,218**	**$0**	**$0**	**$0**	**$111,916**	**$2,224,878**

[1] As per input from government agencies and reported in Chapter 7.
[2] Off-island construction workers from Table 8.1 times estimated service costs (State $1,406.02; County $968.50).
[3] Previously calculated in Table 8.1.
Note: Figures reflect differences ("impact") – i.e., TOD Alternative B minus Future Baseline Condition.

Table 9.2: State and County Fiscal Cost-Revenue Impacts – Construction Phase – TOD Alternative A

Costs/Revenues Flowing from Change from Future Baseline to TOD Alternative A in Construction Costs (Cumulative)									
	Full-Service Hotel	Business Hotel	Condo-Hotel	State Facilities	County Facilities	State Infra-structure	County Infra-structure	Part-Time Resident Initial Expenditures	TOTAL
State Costs									
Total State Facility, Infrastructure Costs[1]				$36,880,619		$0			$36,880,619
Service Cost, Off-Island Constr. Workers[2]	$90,422	$67,872	$45,980	$15,675	$0	$0	$0		$219,948
Total State Costs	***$90,422***	***$67,872***	***$45,980***	***$36,896,293***	***$0***	***$0***	***$0***		***$37,100,566***
State Revenues									
Total State Tax Revenues[3]	***$11,104,906***	***$8,335,484***	***$5,646,899***	***$1,925,077***	***$0***	***$0***	***$0***	***$3,638,522***	***$30,650,887***
State Revenues Minus Costs	**$11,014,484**	**$8,267,612**	**$5,600,919**	**-$34,971,217**	**$0**	**$0**	**$0**	**$3,638,522**	**-$6,449,680**
County Costs									
Total County Facility, Infrastructure Costs[1]					$0		$0		$0
Service Cost, Off-Island Constr. Workers[2]	$56,285	$42,248	$28,621	$9,757	$0	$0	$0		$136,912
Total County Costs	***$56,285***	***$42,248***	***$28,621***	***$9,757***	***$0***	***$0***	***$0***		***$136,912***
County Revenues									
Total County Revenues (GET only)[3]	***$827,865***	***$621,406***	***$420,973***	***$143,513***	***$0***	***$0***	***$0***	***$266,775***	***$2,280,532***
County Revenues Minus Costs	**$771,579**	**$579,157**	**$392,352**	**$133,756**	**$0**	**$0**	**$0**	**$266,775**	**$2,143,620**

[1] As per input from government agencies and reported in Chapter 7.
[2] Off-island construction workers from Table 8.2 times estimated service costs (State $1,406.02; County $968.50).
[3] Previously calculated in Table 8.2.
Note: Figures reflect differences ("impact") – i.e., TOD Alternative A minus Future Baseline Condition.

9.4 Operational Phase

9.4.1 State Results

The upper parts of Table 9.3 and Table 9.4 indicate the State would receive considerably more revenues than costs (about $14.1 million each year for TOD Alternative B and a roughly equal $14.8 million for Alternative A) due to operations of the net new islandwide components.

This is because service costs associated with new transient hotel and part-time resident populations – as well as service costs for residents conservatively assumed to be on-island only because of these economic activities – are greatly outweighed by State tax revenues.

9.4.2 County Results

The lower parts of Table 9.3 and Table 9.4 have two "bottom lines." As explained in Section 2.8.2, county government portions of the Transient Accommodations Tax (TAT, the "hotel room tax") have recently been capped by the State Legislature, such that additions to the lodging inventory under present law would not add to county coffers on any island. But for the long range, it seems reasonable to project the results if the cap is removed and additional TAT money again flows to counties under the previous formula.

If municipal revenues are limited to the GET and increased property tax values for the three hotel sites, the differences between the City and County's revenues and costs – a positive $0.08 million and negative $0.41 million for Alternative B – are essentially zero, considering all the uncertainties in this analysis.

If the TAT is restored, the analysis suggests the TOD Alternative B would generate a small positive annual balance for the County of about $1.2 million per year, and an essentially similar $0.7 million for Alternative B. Even these greater positive figures are quite small in light of the uncertainties underlying this analysis, although they are achieved in the face of various conservative assumptions. The real conclusion to be drawn from the County portions of Table 9.3 and Table 9.4 is that the project is unlikely to have any real perceptible impact at all on annual County operating budgets.

Table 9.3: State and County Fiscal Cost-Revenue Impacts – Operational Phase – TOD Alternative B

Costs/Revenues Flowing from Change from Future Baseline to TOD Alternative B -- Stabilized Operations (Annual)

	Full-Service Hotel	Business Hotel	Condo-Hotel	Change in State Operational Spending[1]	Change in County Operational Spending[1]	Change in Part-Time Residents	TOTAL
State Costs							
Service Costs, Transient Populations[1]	$1,040,684	$711,485	$907,668			$538,039	$3,197,875
Change in Selected Islandwide Operating Costs[1]				$3,852,016			$3,852,016
Total State Costs	***$1,040,684***	***$711,485***	***$907,668***	***$3,852,016***		***$538,039***	***$7,049,892***
State Revenues							
Total State Tax Revenues[2]	***$8,549,200***	***$5,844,833***	***$5,172,868***			***$1,624,947***	***$21,191,848***
State Revenues Minus Costs	**$7,508,516**	**$5,133,349**	**$4,265,201**	**-$3,852,016**		**$1,086,908**	**$14,141,957**
County Costs							
Service Costs, Transient Populations[1]	$647,802	$442,883	$565,002			$334,917	$1,990,603
Change in Islandwide Operating Costs[1]					$1,885,675		$1,885,675
Total County Costs	***$647,802***	***$442,883***	***$565,002***		***$1,885,675***	***$334,917***	***$3,876,278***
A. County Revenues – No Additional TAT							
GET, Annually[2]	$600,143	$410,300	$362,477			$141,577	$1,514,497
Property Tax (Change, Building Values)[3]	$947,254	$711,021	$784,499				$2,442,774
Total County Revenues, No TAT	***$1,547,397***	***$1,121,321***	***$1,146,976***			***$141,577***	***$3,957,271***
A. County Revenues (No TAT) Minus Costs	**$899,595**	**$678,438**	**$581,974**		**-$1,885,675**	**-$193,339**	**$80,993**
B. If Cap on TAT Lifted (Former TAT Laws)							
TAT to County Under Previous System	$461,661	$315,624	$305,073				$1,082,359
Total County Revenues, If TAT Restored	***$2,009,058***	***$1,436,945***	***$1,452,049***		***$0***	***$141,577***	***$5,039,630***
B. County Revenues (with TAT) Minus Costs	**$1,361,257**	**$994,062**	**$887,047**		**-$1,885,675**	**-$193,339**	**$1,163,351**

[1] As noted in Section 2.6, services costs are appropriately limited mostly to transient populations (hotel guests and incremental part-time resident populations), but any increases in islandwide operational spending for selected agencies discussed in Chapter 7 are conservatively included as well. Transient population service costs again estimated as $1,406.02 for State and $968.50 for County.
[2] Previously calculated in Table 8.3. [3] Construction value times rate of $12.40 per $1,000.
Note: Figures reflect differences ("impact") – i.e., TOD Alternative B minus Future Baseline Condition.

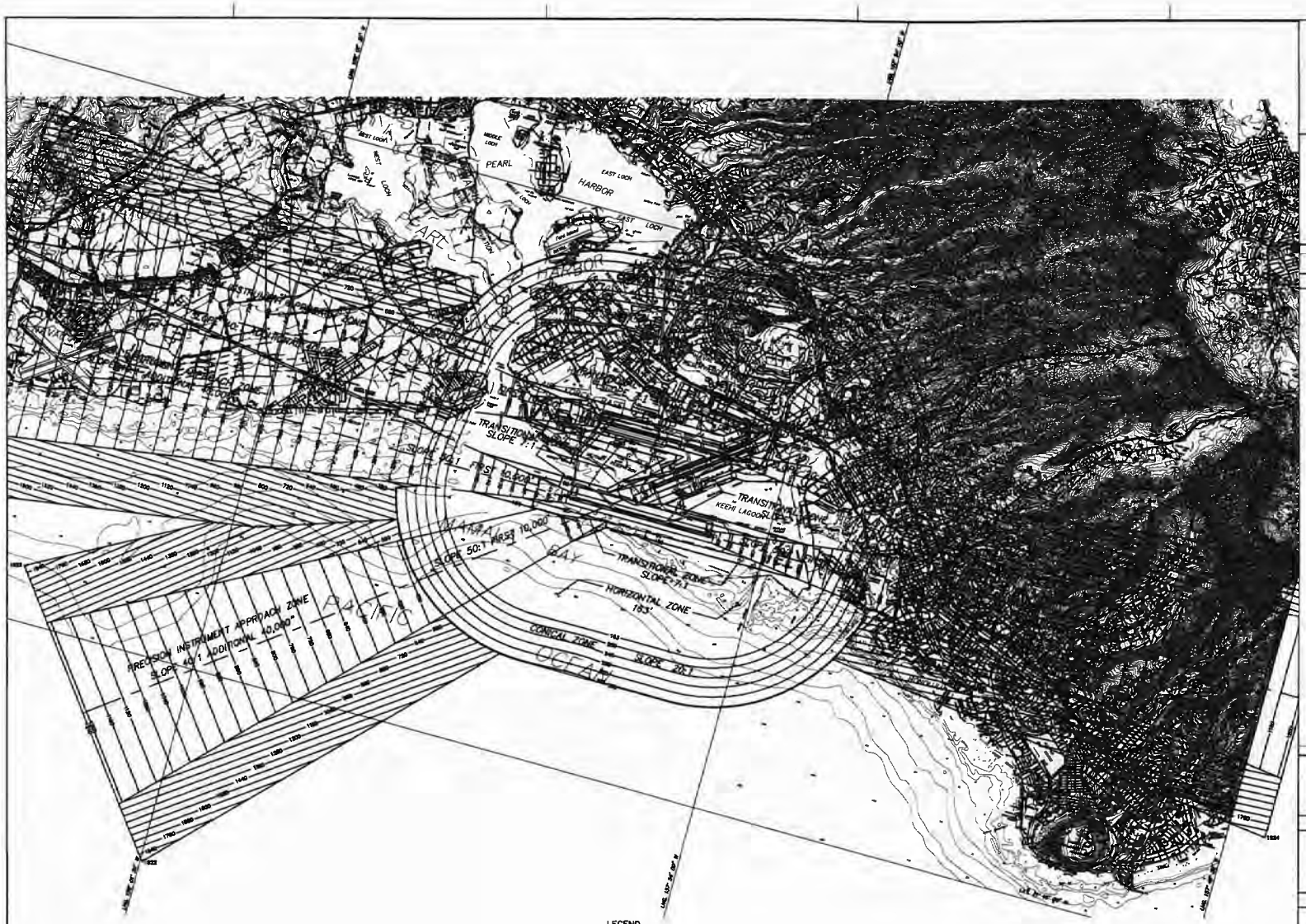
Table 9.4: State and County Fiscal Cost-Revenue Impacts – Operational Phase – TOD Alternative A

Costs/Revenues Flowing from Change from Future Baseline to TOD Alternative A -- Stabilized Operations (Annual)

	Full-Service Hotel	Business Hotel	Condo-Hotel	Change in State Operational Spending[1]	Change in County Operational Spending[1]	Change in Part-Time Residents	TOTAL
State Costs							
Service Costs, Transient Populations[1]	$1,268,437	$711,485	$557,310			$1,051,681	$3,588,912
Change in Selected Islandwide Operating Costs[1]				$4,181,465			$4,181,465
Total State Costs	***$1,268,437***	***$711,485***	***$557,310***	***$4,181,465***		***$1,051,681***	***$7,770,377***
State Revenues							
Total State Tax Revenues[2]	***$10,420,185***	***$5,844,833***	***$3,176,151***			***$3,176,213***	***$22,617,382***
State Revenues Minus Costs	**$9,151,748**	**$5,133,349**	**$2,618,841**	**-$4,181,465**		**$2,124,532**	**$14,847,005**
County Costs							
Service Costs, Transient Populations[1]	$789,572	$442,883	$346,912			$654,647	$2,234,014
Change in Islandwide Operating Costs[1]					$1,957,146		$1,957,146
Total County Costs	***$789,572***	***$442,883***	***$346,912***		***$1,957,146***	***$654,647***	***$4,191,161***
A. County Revenues – No Additional TAT							
GET, Annually[2]	$731,483	$410,300	$222,562			$276,735	$1,641,080
Property Tax (Change, Building Values)[3]	$947,254	$711,021	$481,684				$2,139,959
Total County Revenues, No TAT	***$1,678,738***	***$1,121,321***	***$704,245***			***$276,735***	***$3,781,039***
A. County Revenues (No TAT) Minus Costs	**$889,165**	**$678,438**	**$357,333**		**-$1,957,146**	**-$377,912**	**-$410,122**
B. If Cap on TAT Lifted (Former TAT Laws)							
TAT to County Under Previous System	$562,696	$315,624	$187,315				$1,065,635
Total County Revenues, If TAT Restored	***$2,241,433***	***$1,436,945***	***$891,561***		***$0***	***$276,735***	***$4,846,674***
B. County Revenues (with TAT) Minus Costs	**$1,451,861**	**$994,062**	**$544,648**		**-$1,957,146**	**-$377,912**	**$655,513**

[1] As noted in Section 2.6, services costs are appropriately limited mostly to transient populations (hotel guests and incremental part-time resident populations), but any increases in islandwide operational spending for selected agencies discussed in Chapter 7 are conservatively included as well. Transient population service costs again estimated as $1,406.02 for State and $968.50 for County.
[2] Previously calculated in Table 8.4. [3] Construction value times rate of $12.40 per $1,000.
Note: Figures reflect differences ("impact") – i.e., TOD Alternative B minus Future Baseline Condition.

Appendix H:
Honolulu Airport Zoning Map



DATE OF PHOTOGRAPH: 1 JANUARY 1998
ESTABLISHED AIRPORT ELEVATION ELEVATION 13' M.S.L.

LEGEND

— 580 — AERIAL CONTOURS, M.S.L.
——— AIRPORT BOUNDARY
⊕ AIRPORT REFERENCE POINT (APR) AT:
LAT. 21°19'19" N
LNG. 157°55'32" W

3000 0 3000 6000 9000
SCALE

Airports Division
DEPARTMENT OF TRANSPORTATION
STATE OF HAWAII

DSGN.	DRWN.	CHKD.	APPD.

KEY PLAN / NOTES :

NO.	DATE	REVISIONS

PROJECT TITLE :

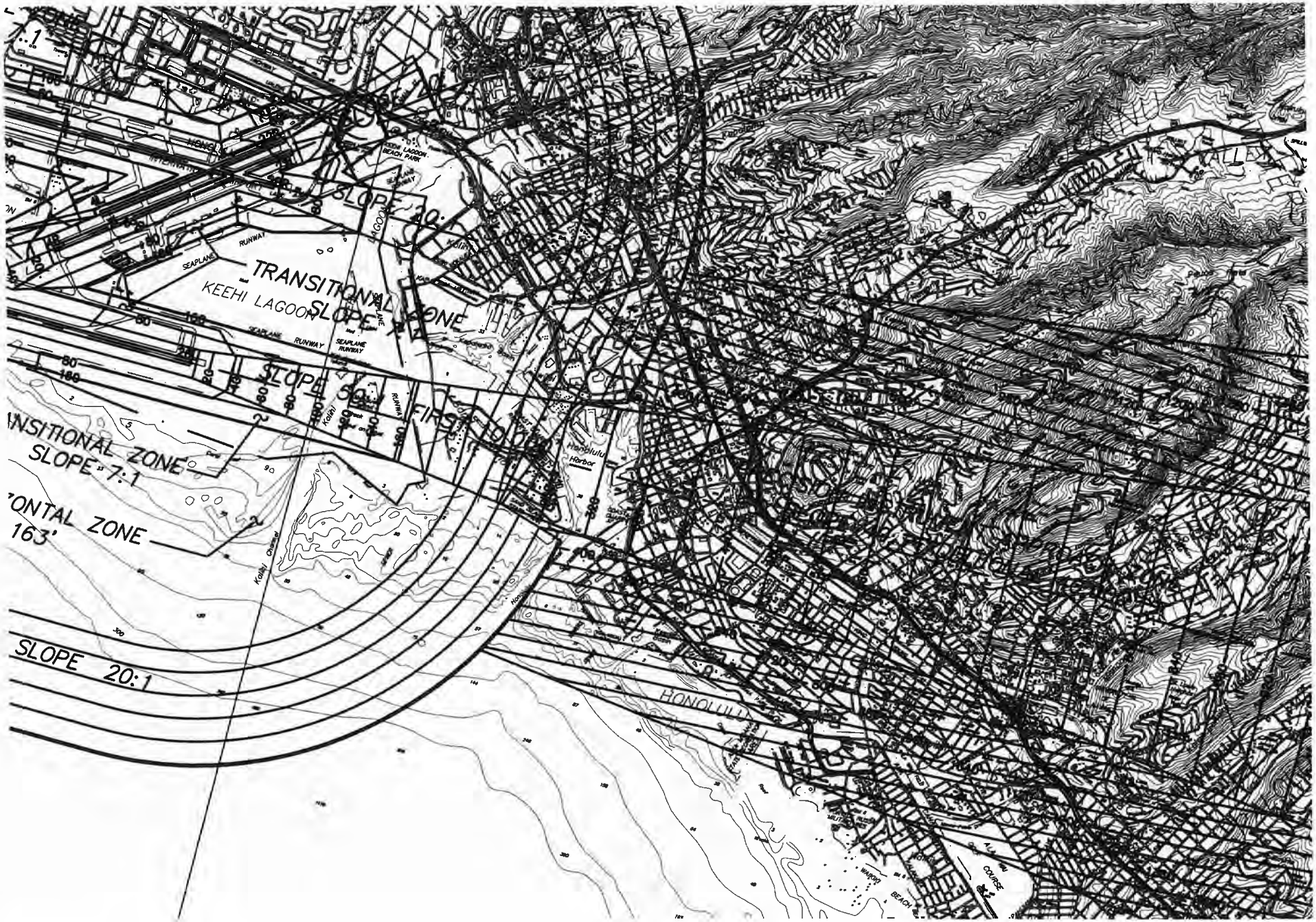
PROJECT NO. :

SHEET TITLE :
HONOLULU INTERNATIONAL AIRPORT
HONOLULU, OAHU, HAWAII

AIRPORT ZONING MAP
EXPANDED TOPOGRAPHIC MAP

DATE : 8-28-98
DWG. NO. :

SHEET 1 OF 2 SHEETS


TRANSITIONAL ZONE
KEEHI LAGOON
SLOPE 20:1
SLOPE 50:1
SLOPE 7:1
163'
SLOPE 20:1
SEAPLANE RUNWAY
Honolulu Harbor
Kaihi Channel
HONOLULU
KAPIOLANI PARK
WAIKIKI BEACH

Appendix I:
Urban Design Aesthetics Methodology

METHODOLOGY APPENDIX

The TOD Overlay Land Use Alternative was developed by the Hawaii Community Development Authority using a blend of methods including 3D modeling programs (Revit, Sketch-up and Google Earth) to test a potential forfull build-out of the area. This model is used to estimate redevelopment proposals, and frequency and spacing of towers meeting the criteria in the design standards in the Mauka Area Rules Chapter 217-15 and the table following.

Future Baseline Condition

The Future Baseline Condition also includes the entitled Master Plan areas; Kamehameha Schools, and Ward Centers. No changes were assumed to these areas.

TOD Overlay Plan Alternative Assumptions

The TOD Alternatives were developed using 3D modeling programs (Revit, Sketch-up and Google Earth) to test a potential build-out of the area, including an exploration of selected sites eligible for redevelopment under proposed either TOD Alternative. This model is used to estimate the frequency and spacing of towers meeting the criteria proposed by the design standards as listed in the table below. The model also provided assumptions for program, capacity and parking assumptions for the Mauka area. Assumptions used for the placement and scale of potential TOD developments are listed following:

In Mauka:

- Site eligibility: all TOD eligible under developed sites will redevelop in the future, unless otherwise constrained by an existing major project (such as an existing tower, condominium), a historic property, institutional land holder, park or open space, or currently engaged with a development permit.
- Where individual parcels with separate ownership are contiguous and can be assembled to make a lot size of 40,000 SF or greater, a developer or property owner will do so to build the maximum gross building area allowable with reasonable allowances for required parking, access, floor plate and height restrictions. Sites less than 40,000 SF will generally develop to their maximum using underlying zoning.
- High Rise developments are constrained by guidelines for height allowances, lot criteria, placement and spacing as noted..
- On adopted Master Plan Areas (Kamehameha Schools) and (Ward Centers Master Plan) general assumptions were made on allocation of new potential residential square footage applicable to the relevant land area. Additional square footage in these locations are assumed to be **residential**, and would be allocated primarily in the addition of taller heights in planned towers, or the application of additional towers on a compatible site.
- New public open space, although a likely incentive for accessing maximum FAR is generally not shown except on Blaisdell Center (this is a publically owned site) and the HECO property (this is a large consolidated property). On smaller parcels, the open space amount and location would be unknown and speculative. Assumptions that open space would be provided at a minimum comparable rate with the Mauka Area Rules, with additional public open space with greater intensity of use.

In Makai

- The project land use alternative took into account the best available information on potential build-out concepts of existing property owners in Makai, meeting the goals and objectives of the Kaka`ako Makai Conceptual Master Plan. For purposes of Analysis the Makai land area is generally shown with dashed lines to show the extent of current height limitations.

Standard	TOD A	TOD B	Mauka Area Plan
Lot Size and Dimension	A minimum lot size of 40,000 SF Heights greater than 420' and up to 550' require a minimum lot size of 90,000 SF (one tower of per development site).	40,000 Sq Ft assumed	All high-rise buildings must have a minimum lot size of 20,000 SF. Maximum lot width is 300'
Street Front Element	75' max height street fronts is proposed for Commercial Boulevards and Avenues. 65' max height is preferred for District Streets (Residential Streets, Local Streets, and internal connectors). 50' setbacks are required tower floor plates above the Street Element on identified Mauka-Makai view corridor streets.	75' max height street fronts is proposed for Commercial Boulevards and Avenues. 65' max height is preferred for District Streets (Residential Streets, Local Streets, and internal connectors). 50' setbacks are required tower floor plates above the Street Element on identified Mauka-Makai view corridor streets.	Street Front Element is currently required at 65'. Variances allowed under both KS and Ward Master Plans. 50' setbacks are required tower floor plates above the Street Element on identified Mauka-Makai view corridor streets.
Building Placement and tower siting	No change is proposed to Mauka build-to lines. Tower siting is flexible. Towers are preferred to be staggered on a development site to preserve internal / external views.	No change is proposed to Mauka build-to lines. Tower siting is flexible. Towers are preferred to be staggered on a development site to preserve internal / external views.	Build-to lines as defined in the Mauka Area Regulating Plan define building placement. **At least 65% of the tower must be flush with the street except in the case of a view corridor street.**
Tower Separation	Maintains requirement as identified in the Mauka Area Rules	Maintains requirement as identified in the Mauka Area Rules	80' is required as a separation between towers (i.e. building above 100' in height.)
Building Types **Tower / Floor Plate controls**	Untethers floor plate from lot size and controls floor plate by building type. Maintain maximum length of 210' between the two farthest points of the tower floor plate. *High rise Commercial/Office*; 28,000 SF/ 240' maximum	Untethers floor plate from lot size and controls floor plate by building type. Maintain maximum length of 210' between the two farthest points of the tower floor plate. *High rise Commercial/Office*; 28,000 SF/ 240'	Horizontal plan projection less than or equal to 150' in one direction, and a maximum length of 210' between the two farthest points of the tower floor plate. (15-217-55). Tower Floor Plate Maximums Lot Size ; Maximum floor plate

VIA ARCHITECTURE DEIS AESTHETICS SEPTEMBER 2014

Efficiency Residential; 24,000 SF / 160' maximum *Point Tower/Center Core Residential Towers*; 9,000–12,500 SF / 550' maximum *Iconic Tower*; Varies according to building height, uses a ratio to control tower profile. / 700' maximum	maximum *Efficiency Residential*; 24,000 SF / 160' maximum *Point Tower/Center Core Residential Towers*; 9,000– 12,500 SF / 400' maximum	> 40,000 SF ; 8,000 SF > 40,000-80,000 SF ; up to 10,000 SF > 80,000-120,000 SF ; up to 12,000 SF >160,000 SF lot; up to 16,000 SF

Appendix J:
Kaka`ako Water Master Plan Update

WATER MASTER PLAN UPDATE

HCDA KAKA‘AKO MAUKA DISTRICT

Kaka‘ako, O‘ahu, Hawai‘i

December 2014

Prepared for:
Lee Sichter LLC
45024-1 Malulani Street
Kāne‘ohe, Hawai‘i 96744
and
The Hawai‘i Community Development Authority

Prepared by:
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2153 North King Street, Suite 200
Honolulu, Hawai‘i 96819

2012.70.0900

1 PURPOSE

The purpose of this study was to provide an updated water master plan for the Hawai‘i Community Development Authority (HCDA) Kaka‘ako Community Development District (KCDD) – Mauka Area. The analysis reflected development projects currently or soon to be under construction, developments and infrastructure upgrades proposed by the Howard Hughes Group (HHG) for its properties within the district, and increased densities proposed in the Transit Oriented Development (TOD) Overlay for the KCDD Mauka Area. Infrastructure requirements determined in previous utility analyses did not include the proposed density increases and infrastructure improvements. These previous utility analyses were presented in the *Mauka Area Infrastructure Plan*[1], which was prepared in conjunction with the *KCDD Final Supplemental Environmental Impact Statement – Mauka Area Plan*[2].

Recommendations were made to upgrade the water infrastructure system to meet the demands of the projected development scenarios. The master plan update will be used by the Honolulu Board of Water Supply (BWS) as a guide for evaluating infrastructure needs for future developments within the KCDD Mauka Area.

2 BACKGROUND

The KCDD study area is approximately 503 acres, bounded by South King Street, Pi‘ikoi Street, Ala Moana Boulevard, and Punchbowl Street, as shown in Figure 1. HCDA is considering rule changes for the KCDD to incorporate TOD. Rule changes would permit greater development densities than currently allowed under the Mauka Area rules. The water master plan maintained by BWS does not reflect the ongoing developments or proposed densities that would be allowed in the Mauka Area rule changes. The BWS master plan for the KCDD Mauka Area was last updated in 2009. This current study analyzed the existing water infrastructure system and commented on whether the existing system could sustain an increase in development density.

The analysis considered five scenarios: the existing condition, a Future Baseline condition, two TOD Overlay alternatives (TOD Alternative A and TOD Alternative B), and the 690 Pohukaina Street Project. Where appropriate, projects currently approved for development were incorporated into each scenario.

A capacity study was prepared for each scenario, identifying the total number of residential units and areas defined by non-residential uses (e.g., office space, commercial space, etc.) in accordance with existing or proposed development rules. Generally, the capacity study was started by determining the maximum developable floor area available to a project based on the parcel area and underlying zoning rules. This area was reduced to account for open space, circulation, and parking requirements, and then adjusted further to account for building setback and height limit requirements. The developable area was then proportioned between residential and commercial

[1] M&E Pacific, *Kakaako Community Development District, Mauka Area Infrastructure Plan* (Honolulu: March 2009).
[2] EDAW, Inc., *Kakaako Community Development District, Final Supplemental Environmental Impact Statement, Mauka Area Plan* (Honolulu: May 2009).

uses. A 4:1 ratio of residential area to commercial area was applied; however, the actual ratio will vary depending on market demand and the developer's requirements. The total number of residential units was then determined by dividing the total residential area by average unit floor areas for different types of units (e.g., luxury, moderate, or workforce units). The unit floor areas ranged from 750 square feet for workforce units to 2,000 square feet for luxury units.

The capacity study only suggested a plausible development scenario. The HCDA Rules allow for a great degree of flexibility in development. Blocks may be developed as a single project or as multiple smaller parcels, and proposed uses may vary widely. Furthermore, development within the KCDD occurs on an opt-in basis. A definitive development schedule or plan for the KCDD is unavailable; therefore, the master plan may not reflect the developments that are ultimately implemented. The development scenarios are summarized below.

- The existing condition was defined as the current land uses for each tax map key parcel and included redevelopment projects currently under construction. Uses and densities were derived from real property records of the individual tax map parcels within the study area.
- The Future Baseline condition represented full build-out in accordance with the current Mauka Area rules. Redevelopment was evaluated by large city blocks that combine several adjacent TMK parcels generally bound by the existing street grid.
- The 690 Pohukaina Street Project is a high-rise condominium project that was incorporated into TOD Alternative A and TOD Alternative B. The project was evaluated separately from the TOD alternatives since completion of the project is anticipated prior to full build-out of the TOD alternatives. The existing condition model was modified to incorporate the project.
- TOD Alternative A represented the full build-out of the KCDD with an increase in densities above what is currently allowed in the Mauka Area rules.
- TOD Alternative B proposed densities similar to the TOD Alternative A, but with a 400-foot building height limit.

For the purposes of the water master plan update, baseline demands for specific properties that are not likely to be redeveloped were applied in all development scenarios. For example, current demands from existing high-rise condominiums, government agency facilities, open space areas such as parks and cemeteries, and projects near or under construction were assumed to remain for each scenario.

Of the three future full build-out scenarios, TOD Alternative A proposes the highest densities and would result in higher water consumption than TOD Alternative B and the Future Baseline condition. Consequently, only the impacts of TOD Alternative A development on the water system were analyzed. The infrastructure improvements proposed for TOD Alternative A would also address the impacts of TOD Alternative B and Future Baseline development on the water infrastructure.

3 ANALYSIS

This water master plan update was prepared in accordance with *Water System Standards* (2002) and additional requirements from BWS that are specific to the KCDD. BWS indicated sufficient water resources are available to serve the KCDD; however, the capacity of the water distribution system within the KCDD needed to be evaluated.

The water system within the KCDD is an interconnected grid with multiple sources and multiple points of inflow and outflow. For the purposes of this update, multiple sources are assigned at water mains equal to and greater than 12" in diameter located at the perimeter of the study area with a starting pressure equal to average system pressures computed by the BWS.

3.1 DOMESTIC WATER CONSUMPTION

The average daily demands for uses published in Table 100-18, Domestic Consumption Guidelines, of the Water System Standards were evaluated for this master plan. At the request of BWS, the average daily consumption rates for multifamily residential and commercial uses were re-evaluated using recent historical water meter billing records and real property records for representative properties within the KCDD. The consumption rates were then aggregated by land use type and averaged to determine revised average daily demand rates (see Table 1). Derivation of the revised demand rates was limited to land use types that are prevalent within the KCDD, including multifamily residential, civic/office, and commercial/restaurant. Average daily demands from *Water System Standards* were used to determine average demands for other land use types.

Table 1: KCDD Water Consumption Rates

Land Use	Standard Average Daily Consumption Rate	Proposed Average Daily Consumption Rate
Single Family Residential	500 gallons / unit	500 gallons / unit
Multifamily Residential	400 gallons / unit	200 gallons / unit
Civic / Office	n/a	120 gallons / 1,000 square feet (sf)
Commercial/Restaurant	69 gallons / 1000 sf (3,000 gallons / acre)	300 gallons / 1000 sf (13,100 gallons / acre)
General/Light Industry	92 gallons / 1000 sf (4,000 gallons / acre)	92 gallons / 1000 sf (4,000 gallons / acre)
School	60 gallons / student	60 gallons / student

The proposed average daily consumption rates listed in Table 1 were applied to all scenarios to determine the average daily consumption. Maximum daily and peak hour demand factors from Table 100-20 in *Water System Standards* were then applied to the average daily demands to determine the respective high-volume demands. Domestic water consumption demands for the planned HHG developments were provided by Wilson Okamoto Corporation. See Tables A through D at the end of this report for the domestic water consumption rates utilized in the modeling.

Domestic consumption rates for adjacent properties were generally aggregated by neighborhood blocks and the domestic demand for each block was applied to a single junction within the KCDD water system model (see Figure 1).

3.2 WATER SYSTEM REQUIREMENTS

Analysis of the water distribution system was based on planning criteria from *Water System Standards*. The following criteria were utilized for all scenarios:

- Pipelines shall be sized to accommodate maximum daily flow plus fire flow with a minimum residual pressure of 20 pounds per square inch (psi) at fire hydrants.
- Pipelines shall be sized to accommodate peak hour flow with a minimum residual pressure of 40 psi.
- The maximum velocity in distribution mains without fire flow shall be 6 feet per second.

In addition to planning criteria from *Water System Standards*, BWS requires fire flow for the entire KCDD to be equal to 4,000 gallons per minute (gpm). KCDD is envisioned to be a densely developed area similar to Waikīkī or downtown Honolulu. This additional requirement was incorporated into the analyses of each scenario.

3.3 HYDRAULIC ANALYSIS

The KCDD water system was analyzed using the water distribution modeling software WaterCAD. The base water system model provided by BWS, which was limited to the KCDD area, was extracted from BWS' overall system model. The water system within the KCDD is part of a larger, interconnected grid that draws water from multiple sources to deliver water to a specific location. Any water system demand applied to an area outside of the KCDD has the potential to impact the water system within the study area.

Recent system improvements and planned improvements to be constructed by BWS or by HHG were also incorporated into the model as appropriate. The following improvements were incorporated into the model and are shown in Figure 2:

- Ward Avenue – Replace an existing 12-inch diameter main with a new 12-inch diameter main and a new 8-inch diameter main from Kapiʻolani Boulevard to Kīnaʻu Street. This improvement was recently completed and was added to all scenarios.
- Ala Moana Boulevard – Replace an existing 12-inch diameter main with a new 24-inch diameter main from Aloha Tower Drive to Kalākaua Avenue. This BWS improvement is planned for construction and was only added to the TOD Alternative A scenario.
- Cooke Street – Replace an existing 12-inch diameter main with a new 20-inch diameter main from Ala Moana Boulevard to Pohukaina Street. This BWS improvement is planned for construction and was only added to the TOD Alternative A scenario.
- Queen Street – Replace an existing 6-inch diameter main with a new 12-inch diameter main from Cooke Street to an existing 12-inch diameter main located between Cummings Street and Kamakee Street. This HHG improvement is planned for construction and was only added to the TOD Alternative A scenario.

To approximate conditions at the boundary of the KCDD water model, multiple incoming sources and outgoing flows were assigned to water mains equal to and greater than 12 inches in diameter located at the perimeter of the study area. Water draws and source pressures at the boundary of the study area were based on average values provided by BWS. No adjustments were made to the average demands and pressures to account for population growth or specific peak demand scenarios.

The existing water distribution system southwest of Ala Moana Boulevard from Punchbowl Street to Ward Avenue is isolated from the rest of the grid by the water system within the KCDD. Consequently, an increase in water consumption from developments within the KCDD could potentially impact this isolated water system. The water system in this area was analyzed in accordance with *Water System Standards* planning criteria for each scenario. Demands for this area were included in the hydraulic model provided by BWS and were held constant for each development scenario and specific peak demand scenario. Under all scenarios, no significant impacts are anticipated to the existing water system in this isolated area due to the proposed increase in densities within the KCDD.

Fire flow demands were applied to selected junctions throughout the KCDD study area. The fire flow junctions were distributed across the study area to obtain representative results for the entire KCDD water system.

3.4 RESULTS

An overall reduction in domestic water consumption of approximately 35 percent was realized by using the proposed average daily consumption rates rather than the current *Water System Standards* rates. The proposed development scenarios are heavily weighted toward multifamily residential units, which largely contributed to the reduction in overall consumption because the proposed average daily consumption rate is half of the *Water System Standards* rate for multifamily residential units.

The existing water system within the KCDD is adequate to meet peak hour domestic demands for all scenarios; however, the existing system is inadequate to meet the fire flow requirement for all scenarios. Specifically, fire hydrants along existing 6-inch diameter water mains will not have adequate residual pressure when operating at 4,000 gpm (see Figures 3 through 5). The model also indicates velocities in some existing 6-inch and 8-inch diameter water mains approaching 30 feet per second and 20 feet per second, respectively, under fire flow conditions. These velocities are well above the general engineering practice maximum value of 10 feet per second.

3.5 MITIGATION MEASURES

The following improvements are recommended for all scenarios:

- Replace approximately 37,580 lineal feet of existing 6-inch and 8-inch diameter mains with new 12-inch diameter mains throughout the KCDD.

The locations of the proposed 12-inch diameter replacement mains are shown in Figure 6. Under fire flow, velocities through the 12-inch diameter replacement mains within the grid system are estimated to drop below 10 feet per second. The larger replacement mains will also provide adequate residual pressures for fire hydrants in operation. The same improvements will satisfy fire flow requirements and pipe velocities for the existing, 690 Pohukaina Street Project, Future Baseline, and TOD Alternative B scenarios.

Water system upgrades will be implemented in phases corresponding to the growth in development density. Improvements may be implemented by the HCDA on an incremental basis prioritizing aging infrastructure or may be implemented by developers to support their projects.

4 OPINIONS OF PROBABLE COST

Opinions of probable costs are estimated for the proposed mitigation measures. A lineal foot unit cost for water line installation is derived from recent similar sewer line construction projects. The total cost includes design fees equal to 10% of the probable construction cost and a 25% contingency.

Table E: Opinion of Probable Construction Costs

Mitigation Measure	Unit Cost	Future Baseline	TOD Alternative A
Replace approximately 37,580 lineal feet of existing 6-inch and 8-inch diameter mains with new 12-inch diameter mains throughout the KCDD.	$1,300 / lf	$49,100,000	$49,100,000

The cost of the system upgrades will be incurred over time as the water system is upgraded in phases.

5 SUMMARY AND RECOMMENDATIONS

The existing KCDD Mauka Area water system as modified by planned BWS and HHG system improvements is capable of meeting peak hour domestic consumption demand requirements; however, the existing system is unable to meet fire flow requirements. Approximately 37,580 lineal feet of existing 6-inch and 8-inch diameter mains will need to be replaced with new 12-inch diameter mains to accommodate the 4,000-gpm fire flow requirement and maintain pipe velocities within an acceptable range. These improvements are recommended for the existing, 690 Pohukaina Street Project, Future Baseline, TOD Alternative A, and TOD Alternative B scenarios. The 690 Pohukaina Street Project will result in a relatively small increase in overall water consumption that is not anticipated to negatively impact the existing water distribution system.

The recommendations prepared for this master plan update are based on a steady-state analysis of the KCDD Mauka Area water system model provided by BWS. The KCDD water model

was extracted from a larger, interconnected grid system that draws water from multiple sources to deliver water to a specific location. Average pressures and outgoing flows provided by BWS were used across all scenarios to approximate boundary conditions for the KCDD water system. Any changes to the water system outside of the KCDD have the potential to impact the water system within the study area.

Figures

- Figure 1 – Domestic Demand Junction Locations
- Figure 2 – Recent and Planned System Improvements
- Figure 3 – Existing Condition Fire Flow
- Figure 4 – 690 Pohukaina Street Fire Flow
- Figure 5 – TOD Alternative A Fire Flow
- Figure 6 – TOD Alternative A Improvements

Tables

- Table A – Population and Utility Demands – Existing Condition
- Table B – Population and Utility Demands – Future Baseline
- Table C – Population and Utility Demands – TOD Alternative A
- Table D – Population and Utility Demands – TOD Alternative B

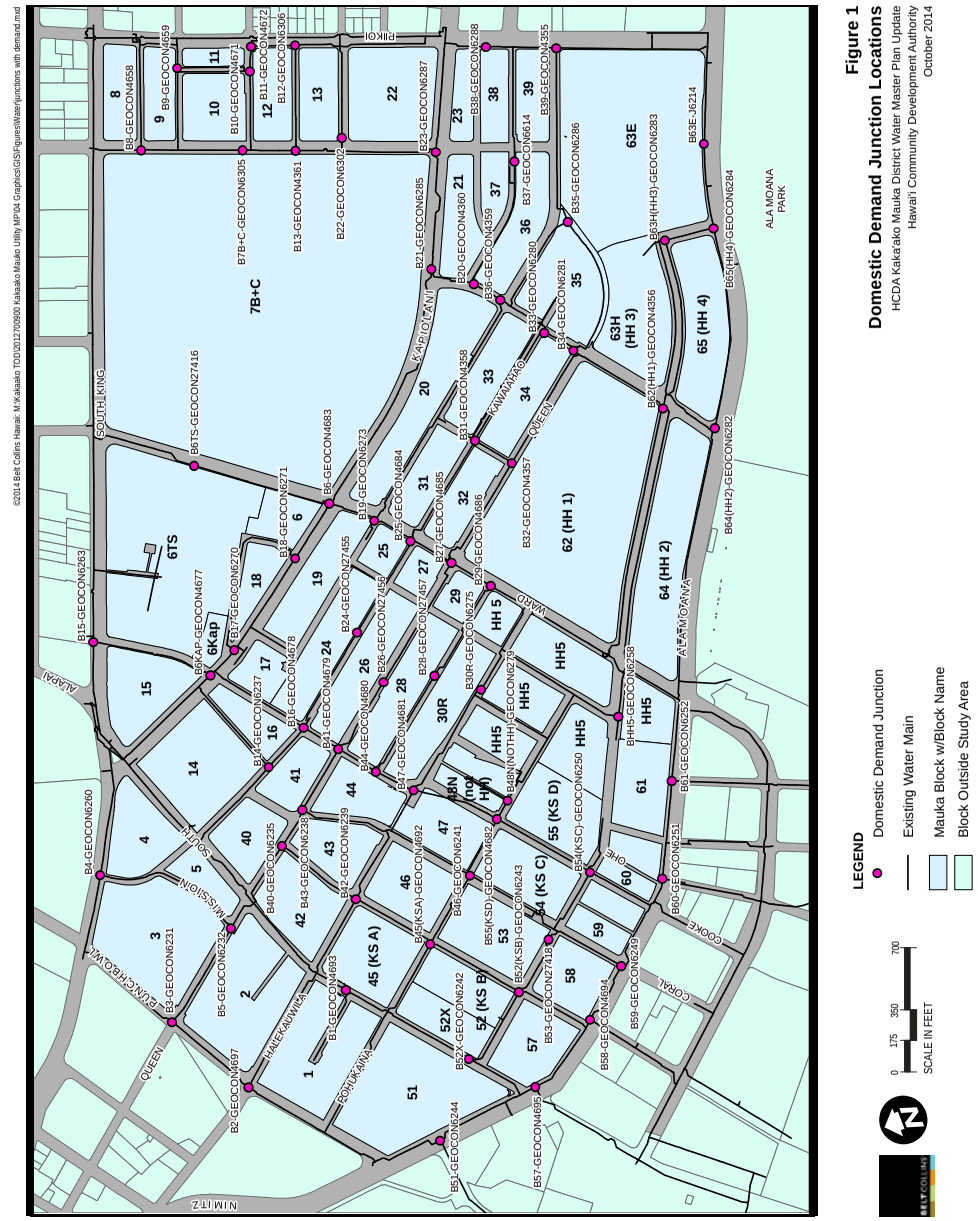
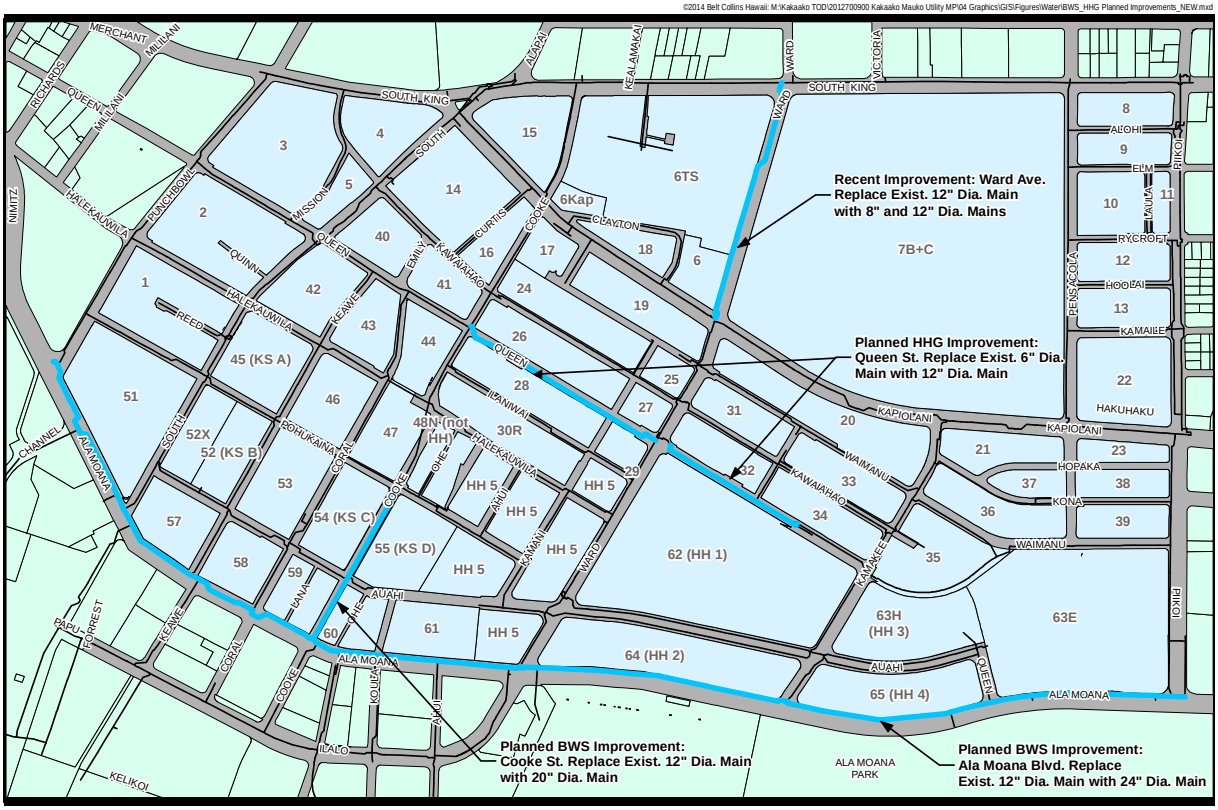


Figure 1
Domestic Demand Junction Locations
HCDA Kakaako Mauka District Water Master Plan Update
Hawai'i Community Development Authority
October 2014

©2014 Belt Collins Hawaii: M:\Kakaako TOD\2012700900 Kakaako Mauko Utility MP\04 Graphics\GIS\Figures\Water\BWS_HHG Planned Improvements_NEW.mxd



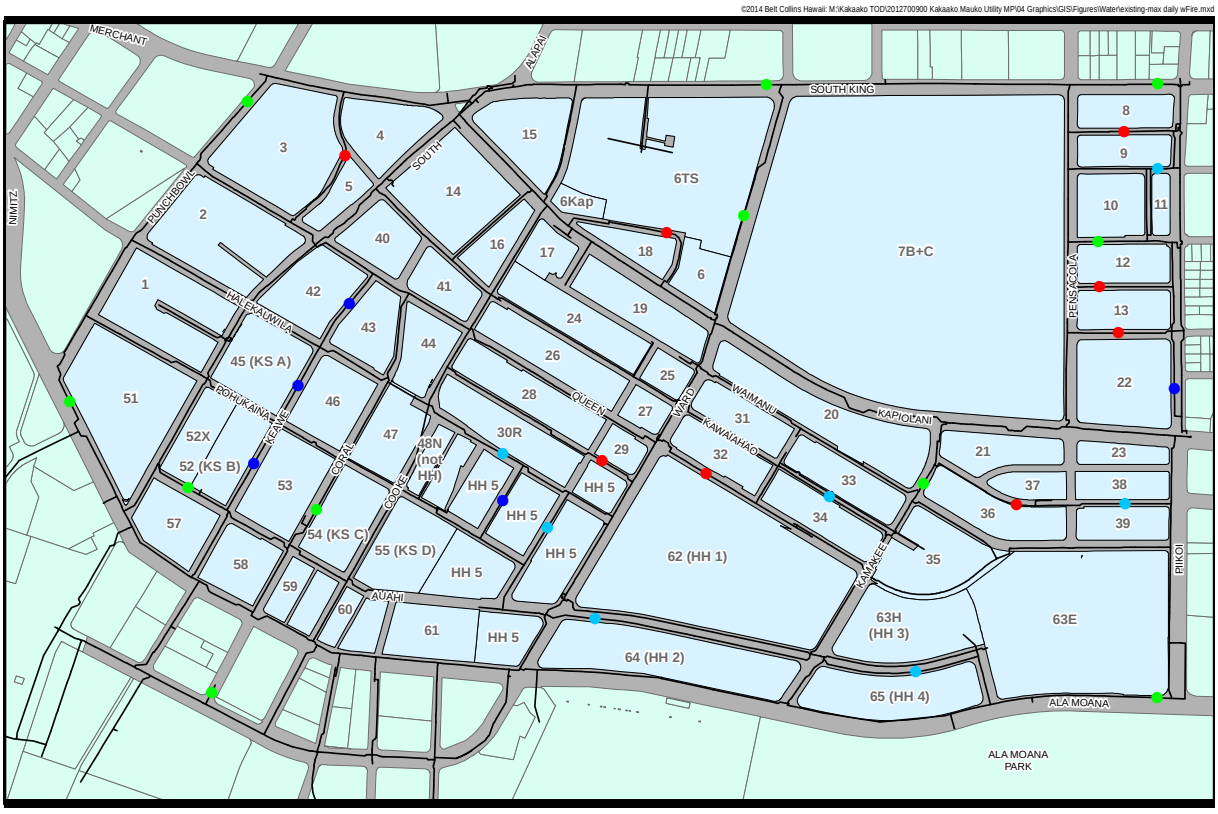
LEGEND

- Recent/Planned Improvement
- Existing Water Main
- Mauka Block w/Block Name
- Block Outside Study Area

0 175 350 700
SCALE IN FEET

Figure 2
Recent and Planned System Improvements
HCDA Kaka'ako District Mauka Water Master Plan Update
Hawai'i Community Development Authority
October 2014

©2014 Belt Collins Hawaii: M:\Kakaako TOD\2012700900 Kakaako Mauko Utility MP\04 Graphics\GIS\Figures\Water\existing-max daily wFire.mxd



LEGEND

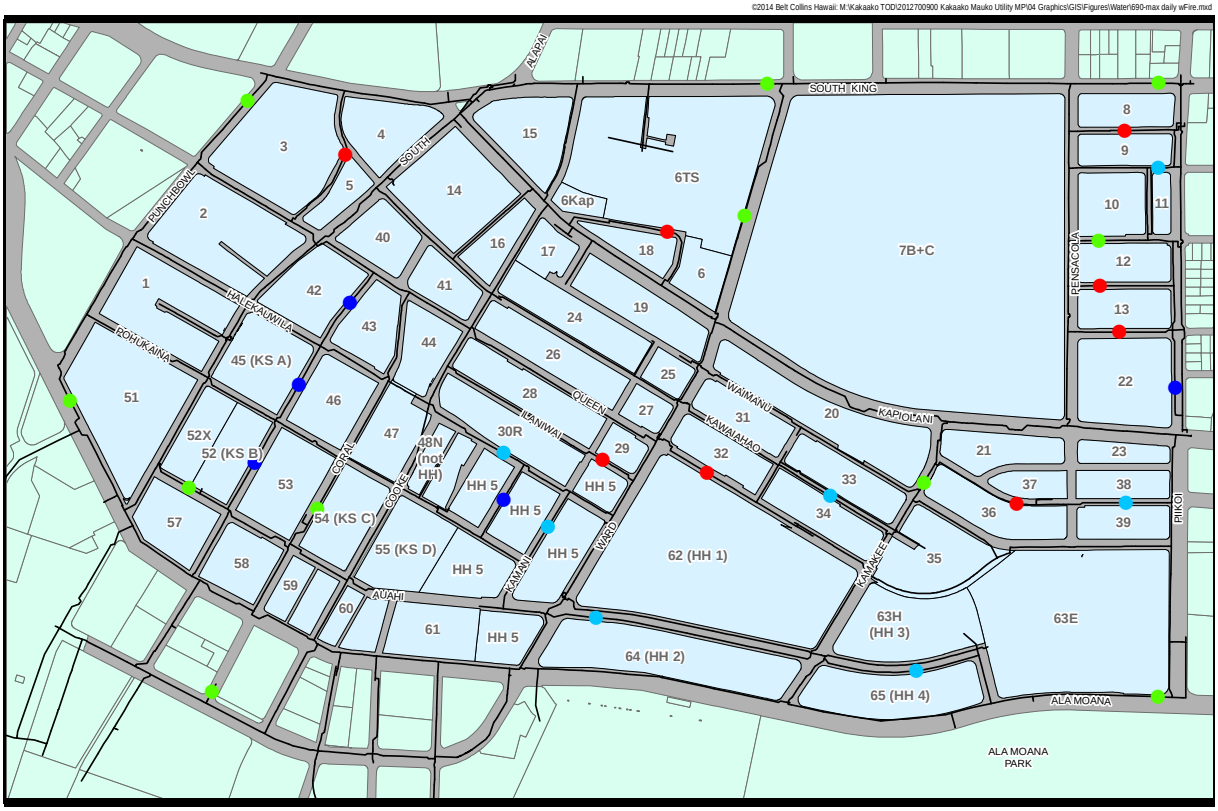
Junction w/ Fire Flow	Residual Pressure (psi)
●	Less than 20
●	20 to 40
●	40 to 60
●	Greater than 60

- Existing Water Main
- Mauka Block w/Block Name
- Block Outside Study Area

0 175 350 700
SCALE IN FEET

Figure 3
Existing Condition Fire Flow
HCDA Kaka'ako District Mauka Water Master Plan Update
Hawai'i Community Development Authority
October 2014

©2014 Belt Collins Hawaii: M:\Kakaako TOD\2012700900 Kakaako Mauka Utility MP\04 Graphics\GIS\Figures\Water\690-max daily wFire.mxd



LEGEND

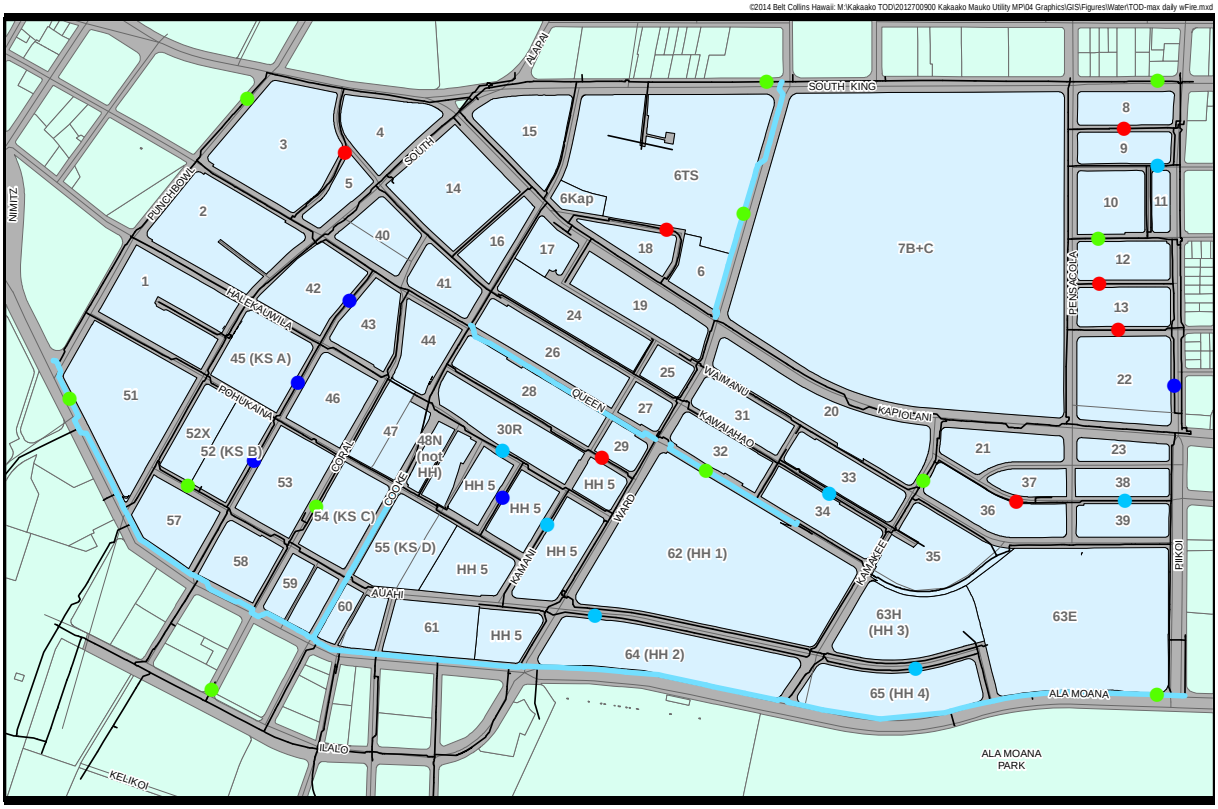
Junction w/ Fire Flow	Residual Pressure (psi)
●	Less than 20
●	20 to 40
●	40 to 60
●	Greater than 60

Existing Water Main
Mauka Block w/Block Name
Block Outside Study Area

0 175 350 700
SCALE IN FEET

Figure 4
690 Pohukaina Street Fire Flow
HCDA Kaka'ako District Mauka Water Master Plan Update
Hawai'i Community Development Authority
October 2014

©2014 Belt Collins Hawaii: M:\Kakaako TOD\2012700900 Kakaako Mauka Utility MP\04 Graphics\GIS\Figures\Water\TOD-max daily wFire.mxd



LEGEND

Junction w/ Fire Flow	Residual Pressure (psi)
●	Less than 20
●	20 to 40
●	40 to 60
●	Greater than 60

Recent/Planned Improvement
Existing Water Main
Mauka Block w/Block Name
Block Outside Study Area

0 175 350 700
SCALE IN FEET

Figure 5
TOD Alternative A Fire Flow
HCDA Kaka'ako District Mauka Water Master Plan Update
Hawai'i Community Development Authority
October 2014

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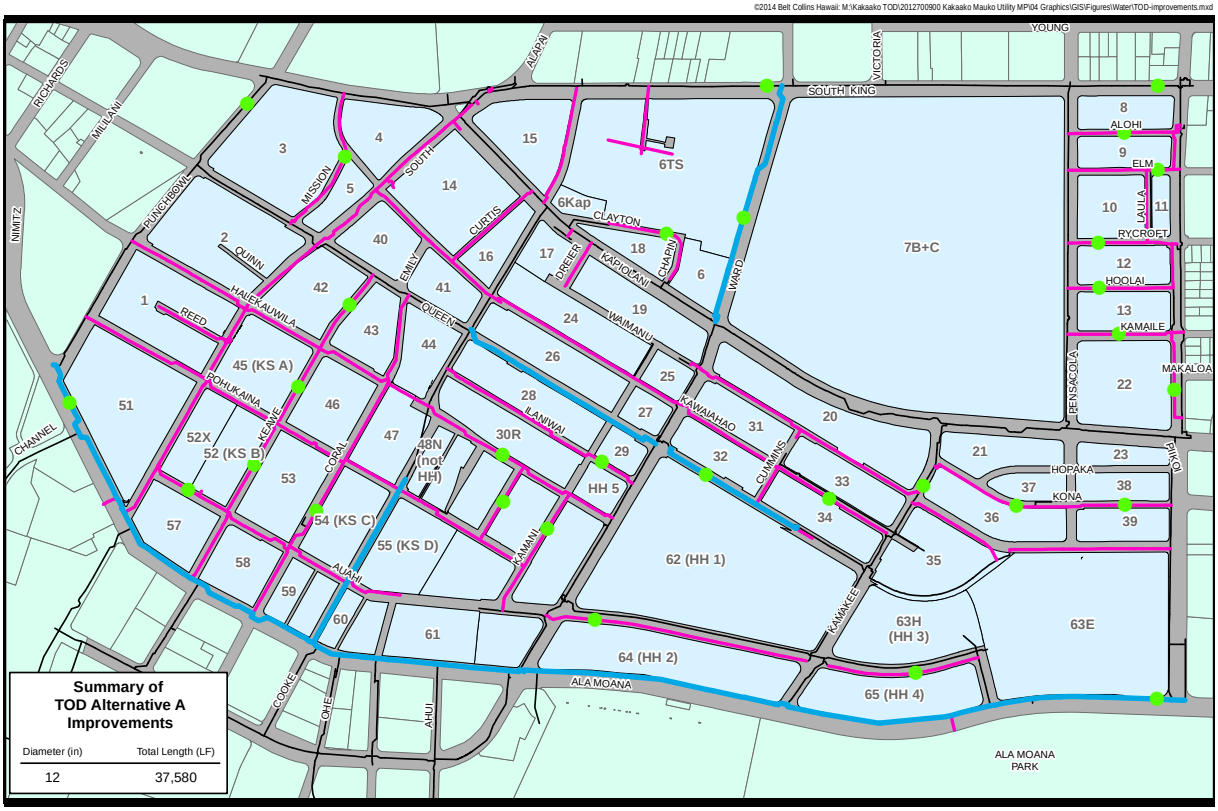

LEGEND

- Recent/Planned Improvement by Others
- TOD Improvement: Replace Exist. 6" Dia. Main or 8" Dia. Main w/12" Dia. Main
- Existing Water Main
- Mauka Block w/Block Name
- Block Outside Study Area

Junction w/ Fire Flow — Residual Pressure (psi)

- Greater than 60

0 175 350 700
SCALE IN FEET

Figure 6
TOD Alternative A Improvements
HCDA Kaka'ako District Mauka Water Master Plan Update
Hawai'i Community Development Authority
October 2014

Table A: Population and Utility Demands - Existing Condition

Land Use: Existing Condition												Domestic Water Consumption							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civil / Office	Commercial	General / Light Industry	Other	Average Day Flow
				units	units	units	SF	SF	SF	SF		500 gal/unit	200 gal/unit	350 ga/unit	120 gal/1000 sf	300 gal/1000 sf	92 gal/1000 sf	gal	gpd
RESTAURANT ROW	51	21029001	Pauahi				500,812				OFFICES	0	0	0	60098	0	0		60098
KEAHOU LANE	45 (KS A)	21030001	Pauahi		632			41,999			APARTMENT/COMMERCIAL	0	126400	0	0	12600	0		139000
COURTHOUSE - SINGLE STORY	1	21030003	Civic Center				68,300				OFFICES	0	0	0	8196	0	0		8196
	1	21030008	Civic Center						1,000		WAREHOUSE	0	0	0	0	0	92		92
	1	21030008	Civic Center				6,000				OFFICES	0	0	0	720	0	0		720
	1	21030013	Civic Center				2,874				OFFICES	0	0	0	345	0	0		345
	1	21030014	Civic Center						2,856		WAREHOUSE	0	0	0	0	0	263		263
	1	21030015	Civic Center				9,438				OFF ENCL WAREHSE	0	0	0	1133	0	0		1133
	1	21030017	Civic Center				19,907				OFFICES	0	0	0	2389	0	0		2389
	2	21031002	Civic Center				2,500				OFFICES	0	0	0	300	0	0		300
	2	21031005	Civic Center				1,533		1,533		OFFICES / WAREHOUSE	0	0	0	184	0	142		326
	2	21031008	Civic Center				22,753				BANK/SAVINGS INST/PARKING	0	0	0	2731	0	0		2731
DOT	2	21031010	Civic Center								PARK STRUCTURE	0	0	0	0	0	0		0
DOT	2	21031012	Civic Center				55,000				OFFICES	0	0	0	6600	0	0		6600
HFD HQ/Museum	2	21031015	Civic Center				50,050				OFFICES	0	0	0	6006	0	0		6006
HFD Kaka'ako Station	2	21031018	Civic Center				5,200				OFFICES	0	0	0	624	0	0		624
	2	21031019	Civic Center		6						APARTMENT	0	1200	0	0	0	0		1200
	2	21031020	Civic Center				14,200				OFFICES	0	0	0	1704	0	0		1704
HONUAKAHA	2	21031021	Civic Center		96		18,202				APARTMENT / OFFICES	0	19200	0	2185	0	0		21385
	2	21031024	Civic Center				11,410				OFFICES/PARKING	0	0	0	1370	0	0		1370
	42	21031030	Pauahi						26,800		AUTO PARTS/SERVICE	0	0	0	0	0	2466		2466
	42	21031032	Pauahi				2,284		5,450		OFFICES/WAREHOUSE	0	0	0	275	0	502		777
	42	21031033	Pauahi				17,554				OFFICES	0	0	0	2107	0	0		2107
	4	21032001	Civic Center				103,433				OFFICES/PARKING	0	0	0	12412	0	0		12412
Mission Houses	4	21032002	Civic Center				14,163				OFFICES	0	0	0	1700	0	0		1700
Mission Houses	4	21032002	Civic Center						420		LIGHT MANUFACTURING	0	0	0	0	0	39		39
	5	21032007	Civic Center						19,289		WAREHOUSE	0	0	0	0	0	1775		1775
	5	21032008	Civic Center	2							SF HOME	1000	0	0	0	0	0		1000
	5	21032009	Civic Center				4,079				OFFICES	0	0	0	490	0	0		490
	5	21032010	Civic Center						25,004		WAREHOUSE	0	0	0	0	0	2301		2301
	5	21032010	Civic Center				5,002				MEZZ ENCL OFFICE	0	0	0	601	0	0		601
	5	21032011	Civic Center						5,893		AUTO PARTS/SERVICE	0	0	0	0	0	543		543
	5	21032012	Civic Center				4,060		5,893		WAREHOUSE	0	0	0	488	0	543		1031
	3	21032015	Civic Center							30,186	RELIGIOUS INST	0	0	0	0	0	0	9056 Commercial	9056
KAWAIHAO CHURCH	3	21032017	Civic Center							11,805	RELIGIOUS INST	0	0	0	0	0	0	3542 Commercial	3542
	3	21032017	Civic Center							4,977	SCHOOL	0	0	0	0	0	0	3780 60 gal/student	3780
	3	21032017	Civic Center				14,500				OFFICES	0	0	0	1740	0	0		1740
	3	21032022	Civic Center							6,192	SCHOOL	0	0	0	0	0	0	4680 60 gal/student	4680
	3	21032022	Civic Center				6,192				OFFICES	0	0	0	744	0	0		744
	3	21032023	Civic Center						2,262		WAREHOUSE	0	0	0	0	0	209		209
HECO	6TS	21044003	Thomas Square				15,385				OFFICES	0	0	0	1847	0	0		1847
HECO	6TS	21044003	Thomas Square						140,843		WAREHOUSE	0	0	0	0	0	12958		12958
	6TS	21044004	Thomas Square								BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	6TS	21044004	Thomas Square				2,769				OFFICES	0	0	0	333	0	0		333
HONOLULU CLUB	6TS	21044005	Thomas Square				69,299				OFFICES	0	0	0	8316	0	0		8316
HONOLULU CLUB	6TS	21044005	Thomas Square							10912	RESTAURANT	0	0	0	0	0	0		0
HONOLULU CLUB	6TS	21044005	Thomas Square							38909	BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	18	21044022	Kapiolani				84,296				OFFICES	0	0	0	10116	0	0		10116
	18	21044022	Kapiolani					4,679			RETAIL STORE	0	0	0	0	1404	0		1404
	18	21044022	Kapiolani						9,933		WAREHOUSE	0	0	0	0	0	914		914
	18	21044023	Kapiolani					36,380			AUTO SHOWROOM/OFFICE	0	0	0	0	10914	0		10914
	18	21044023	Kapiolani								PARK STRUCTURE	0	0	0	0	0	0		0
	18	21044023	Kapiolani						28,196		AUTO PARTS/SERVICE	0	0	0	0	0	2595		2595
ROYAL COURT	6TS	21044033	Thomas Square		112						APARTMENT	0	22400	0	0	0	0		22400
	18	21044034	Kapiolani							4000	RESTAURANT	0	0	0	0	0	0	1200 Commercial	1200
	6TS	21044038	Thomas Square					1,749			CONVENIENCE STORE	0	0	0	0	525	0		525
ONE ARCHER LANE	6TS	21044041	Thomas Square		331						APARTMENT	0	66200	0	0	0	0		66200
VANGUARD LOFTS	6Kap	21044046	Kapiolani		38						APARTMENT	0	7600	0	0	0	0		7600
VANGUARD LOFTS	6Kap	21044046	Kapiolani					3616			AUTO SHOWROOM/OFFICE	0	0	0	0	1085	0		1085
	15	21046001	Kapiolani				3,857				MEZZ ENCL OFFICE	0	0	0	463	0	0		463
	15	21046001	Kapiolani						10,727		AUTO PARTS/SERVICE	0	0	0	0	0	987		987
	15	21046001	Kapiolani					3,814			AUTO SHOWROOM/OFFICE	0	0	0	0	1145	0		1145
	15	21046002	Kapiolani							11,446	RESTAURANT	0	0	0	0	0	0	3434 Commercial	3434
	15	21046002	Kapiolani				14,170				OFFICES	0	0	0	1701	0	0		1701

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				units	units	units	SF	SF	SF	SF									
	15	21046003	Kapiolani				11,993				OFFICES	0	0	0	1440	0	0		1440
	15	21046005	Kapiolani				2,538				OFFICES	0	0	0	305	0	0		305
	15	21046005	Kapiolani				6,213				MEZZ ENCL OFFICE	0	0	0	746	0	0		746
	15	21046005	Kapiolani						6,213		WAREHOUSE	0	0	0	0	0	572		572
	15	21046007	Kapiolani				42,978				OFFICES	0	0	0	5158	0	0		5158
HO'OMANA NA'AUAAO O Hawai'i - CHURCH	15	21046009	Kapiolani							6,907	RELIGIOUS INST	0	0	0	0	0	0	2073 Commercial	2073
PACIFIC PARK PLAZA	16	21047001	Kapiolani				96,613				OFFICES	0	0	0	11594	0	0		11594
	14	21047002	Kapiolani								PARK STRUCTURE	0	0	0	0	0	0		0
801 SOUTH PH1	14	21047003	Kapiolani		636							0	127200	0	0	0	0		127200
801 SOUTH PH1	14	21047003	Kapiolani									0	0	0	0	0	0		0
801 SOUTH PH1	14	21047004	Kapiolani				66,593				OFFICES	0	0	0	7992	0	0		7992
801 SOUTH PH2	14	21047004	Kapiolani		410						APARTMENT	0	82000	0	0	0	0		82000
801 SOUTH PH2	14	21047004	Kapiolani									0	0	0	0	0	0		0
	14	21047005	Kapiolani					3,724			AUTO SHOWROOM/OFFICE	0	0	0	0	1118	0		1118
	14	21047005	Kapiolani						1,506		AUTO PARTS/SERVICE	0	0	0	0	0	139		139
	14	21047005	Kapiolani				3,984				OFFICES	0	0	0	479	0	0		479
ROYAL CAPITOL PLAZA	14	21047008	Kapiolani		297						APARTMENT	0	59400	0	0	0	0		59400
ROYAL CAPITOL PLAZA	14	21047008	Kapiolani					947			CONVENIENCE STORE	0	0	0	0	285	0		285
ROYAL CAPITOL PLAZA	14	21047008	Kapiolani						1,511		MINI-WAREHOUSE	0	0	0	0	0	140		140
	41	21048001	Pauahi						7,630		WAREHOUSE	0	0	0	0	0	702		702
	41	21048001	Pauahi				400				OFF ENCL WAREHSE	0	0	0	48	0	0		48
	41	21048002	Pauahi					7,985			RETAIL STORE	0	0	0	0	2396	0		2396
	41	21048005	Pauahi						5,158		WAREHOUSE	0	0	0	0	0	475		475
	41	21048005	Pauahi				3,996				MEZZ ENCL OFFICE	0	0	0	480	0	0		480
	41	21048006	Pauahi						40,491		WAREHOUSE	0	0	0	0	0	3726		3726
	41	21048006	Pauahi				19,096				MEZZ ENCL OFFICE	0	0	0	2292	0	0		2292
KEOLA LAI	40	21048008	Pauahi		353						APARTMENT	0	70600	0	0	0	0		70600
KEOLA LAI	40	21048008	Pauahi					8,607			RETAIL STORE	0	0	0	0	2583	0		2583
	41	21048022	Pauahi							1,334	RESTAURANT	0	0	0	0	0	0	401 Commercial	401
	41	21048022	Pauahi				812				OFFICES	0	0	0	98	0	0		98
	41	21048022	Pauahi		4						APARTMENT	0	800	0	0	0	0		800
	27	21049001	Central Kakaako						2,629		SERVICE STATION W/BAYS	0	0	0	0	0	242		242
	27	21049003	Central Kakaako		1						APARTMENT	0	200	0	0	0	0		200
	27	21049003	Central Kakaako				1,650				OFFICES	0	0	0	198	0	0		198
	27	21049004	Central Kakaako						2,100		WAREHOUSE	0	0	0	0	0	194		194
	27	21049005	Central Kakaako		2						APARTMENT	0	400	0	0	0	0		400
	26	21049008	Central Kakaako				4,917				OFFICES	0	0	0	591	0	0		591
	26	21049009	Central Kakaako						2,500		AUTO PARTS/SERVICE	0	0	0	0	0	230		230
	26	21049010	Central Kakaako						3,750		WAREHOUSE	0	0	0	0	0	345		345
	26	21049011	Central Kakaako				855				OFFICES	0	0	0	103	0	0		103
	26	21049011	Central Kakaako						27,860		WAREHOUSE	0	0	0	0	0	2564		2564
	26	21049012	Central Kakaako				902				OFFICES	0	0	0	109	0	0		109
	26	21049014	Central Kakaako						1,970		AUTO PARTS/SERVICE	0	0	0	0	0	182		182
	26	21049014	Central Kakaako				132				OFF ENCL WAREHSE	0	0	0	16	0	0		16
	26	21049015	Central Kakaako				700				OFFICES	0	0	0	84	0	0		84
	26	21049015	Central Kakaako						2,170		WAREHOUSE	0	0	0	0	0	200		200
	26	21049018	Central Kakaako				2,700				OFFICES	0	0	0	324	0	0		324
	26	21049019	Central Kakaako				14,940				OFFICES	0	0	0	1793	0	0		1793
	26	21049020	Central Kakaako								PARKING PAR/ENCL	0	0	0	0	0	0		0
	26	21049020	Central Kakaako					4,628			RETAIL STORE	0	0	0	0	1389	0		1389
	26	21049021	Central Kakaako						1,650		WAREHOUSE	0	0	0	0	0	152		152
	26	21049022	Central Kakaako						2,794		WAREHOUSE	0	0	0	0	0	258		258
	26	21049023	Central Kakaako				500				OFF ENCL WAREHSE	0	0	0	60	0	0		60
	26	21049023	Central Kakaako						6,750		WAREHOUSE	0	0	0	0	0	621		621
	26	21049024	Central Kakaako					1,428			RETAIL STORE	0	0	0	0	429	0		429
	26	21049025	Central Kakaako						4,250		WAREHOUSE	0	0	0	0	0	391		391
	26	21049026	Central Kakaako				808				OFFICES	0	0	0	97	0	0		97
	26	21049026	Central Kakaako							4,600	RESTAURANT	0	0	0	0	0	0	1380 Commercial	1380
IMPERIAL PLAZA	24	21049027	Central Kakaako		206						APARTMENT	0	41200	0	0	0	0		41200
IMPERIAL PLAZA	17	21049027	Central Kakaako					50,967			RETAIL STORE	0	0	0	0	15291	0		15291
IMPERIAL PLAZA	17	21049027	Central Kakaako				10,904				OFFICES	0	0	0	1309	0	0		1309
IMPERIAL PLAZA	17	21049027	Central Kakaako				483				MEZZ ENCL OFFICE	0	0	0	58	0	0		58
	26	21049028	Central Kakaako						3,600		WAREHOUSE	0	0	0	0	0	332		332
	26	21049029	Central Kakaako						2,000		WAREHOUSE	0	0	0	0	0	184		184
	26	21049030	Central Kakaako					846			MEZZ DISPLAY SALES	0	0	0	0	254	0		254
	26	21049030	Central Kakaako						5,000		WAREHOUSE	0	0	0	0	0	460		460

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				units	units	units	SF	SF	SF	SF									
	26	21049031	Central Kakaako						3,945		WAREHOUSE	0	0	0	0	0	363		363
	26	21049032	Central Kakaako				1,000				MEZZ ENCL OFFICE	0	0	0	120	0	0		120
	26	21049032	Central Kakaako				1,000				OFFICES	0	0	0	120	0	0		120
	26	21049032	Central Kakaako						8,400		WAREHOUSE	0	0	0	0	0	773		773
	26	21049033	Central Kakaako				288				OFF ENCL WAREHSE	0	0	0	35	0	0		35
	26	21049033	Central Kakaako						3,285		WAREHOUSE	0	0	0	0	0	303		303
	26	21049037	Central Kakaako				200				OFFICES	0	0	0	24	0	0		24
	26	21049037	Central Kakaako						1,300		WAREHOUSE	0	0	0	0	0	120		120
	26	21049038	Central Kakaako				520				OFFICES	0	0	0	63	0	0		63
	26	21049038	Central Kakaako						4,000		WAREHOUSE	0	0	0	0	0	368		368
	24	21049040	Central Kakaako						4,000		WAREHOUSE	0	0	0	0	0	368		368
	24	21049041	Central Kakaako				3,000				OFFICES	0	0	0	360	0	0		360
	24	21049041	Central Kakaako						3,000		WAREHOUSE	0	0	0	0	0	276		276
	24	21049042	Central Kakaako						3,750		WAREHOUSE	0	0	0	0	0	345		345
	24	21049043	Central Kakaako					1,904			RETAIL STORE	0	0	0	0	572	0		572
	24	21049043	Central Kakaako						1,428		WAREHOUSE	0	0	0	0	0	132		132
	24	21049045	Central Kakaako				30,000				OFFICES	0	0	0	3600	0	0		3600
	24	21049045	Central Kakaako						182,450		WAREHOUSE	0	0	0	0	0	16786		16786
	24	21049046	Central Kakaako						1,600		WAREHOUSE	0	0	0	0	0	148		148
	24	21049049	Central Kakaako						1,050		WAREHOUSE	0	0	0	0	0	97		97
803 Waimanu	24	21049050	Central Kakaako		153						APARTMENT	0	30600	0	0	0	0		30600
	24	21049054	Central Kakaako					975			MEZZ DISPLAY SALES	0	0	0	0	293	0		293
	24	21049054	Central Kakaako				1,364				OFF ENCL WAREHSE	0	0	0	164	0	0		164
	24	21049054	Central Kakaako						5,353		WAREHOUSE	0	0	0	0	0	493		493
	25	21049055	Central Kakaako					1,620			RETAIL STORE	0	0	0	0	486	0		486
	25	21049055	Central Kakaako						2,250		WAREHOUSE	0	0	0	0	0	207		207
	25	21049056	Central Kakaako	1							SF HOME	500	0	0	0	0	0		500
	25	21049057	Central Kakaako	1							SF HOME	500	0	0	0	0	0		500
	25	21049058	Central Kakaako						4,275		WAREHOUSE	0	0	0	0	0	394		394
	25	21049060	Central Kakaako					1,008			RETAIL STORE	0	0	0	0	303	0		303
	25	21049060	Central Kakaako						2,400		WAREHOUSE	0	0	0	0	0	221		221
	25	21049061	Central Kakaako						3,800		WAREHOUSE	0	0	0	0	0	350		350
	19	21049063	Kapiolani				5,207				OFFICES	0	0	0	625	0	0		625
	19	21049063	Kapiolani							5,239	RESTAURANT	0	0	0	0	0	0	1572 Commercial	1572
	19	21049064	Kapiolani				3,022				OFFICES	0	0	0	363	0	0		363
	19	21049064	Kapiolani							3,478	RESTAURANT	0	0	0	0	0	0	1044 Commercial	1044
	19	21049066	Kapiolani					53,124			AUTO SHOWROOM/OFFICE	0	0	0	0	15938	0		15938
	19	21049066	Kapiolani					1,034			MEZZ DISPLAY SALES	0	0	0	0	311	0		311
	25	21049069	Central Kakaako					2,805			RETAIL STORE	0	0	0	0	842	0		842
	24	21049070	Central Kakaako				160				OFF ENCL WAREHSE	0	0	0	20	0	0		20
	24	21049071	Central Kakaako						1,830		WAREHOUSE	0	0	0	0	0	169		169
	24	21049073	Central Kakaako						7,580		WAREHOUSE	0	0	0	0	0	698		698
	19	21049075	Kapiolani					665			MEZZ DISPLAY SALES	0	0	0	0	200	0		200
	19	21049075	Kapiolani				1,501				OFFICES	0	0	0	181	0	0		181
	19	21049075	Kapiolani						5,267		WAREHOUSE	0	0	0	0	0	485		485
	24	21049076	Central Kakaako				1,026				OFFICES	0	0	0	124	0	0		124
	24	21049076	Central Kakaako						6,030		WAREHOUSE	0	0	0	0	0	555		555
	27	21049078	Central Kakaako						14,500		AUTO PARTS/SERVICE	0	0	0	0	0	1334		1334
	26	21049079	Central Kakaako						3,564		WAREHOUSE	0	0	0	0	0	328		328
	19	21049080	Kapiolani							3,129	RESTAURANT	0	0	0	0	0	0	939 Commercial	939
	HH 5	21050001	Pauahi						9,600		WAREHOUSE	0	0	0	0	0	884		884
	30R	21050002	Central Kakaako				3,050				OFFICES	0	0	0	366	0	0		366
	30R	21050003	Central Kakaako				3,500				OFF ENCL WAREHSE	0	0	0	420	0	0		420
	30R	21050003	Central Kakaako						20,500		WAREHOUSE	0	0	0	0	0	1886		1886
	30R	21050004	Central Kakaako				6,202				OFF ENCL WAREHSE	0	0	0	745	0	0		745
	30R	21050004	Central Kakaako					3,082			RETAIL STORE	0	0	0	0	925	0		925
	30R	21050004	Central Kakaako						12,241		WAREHOUSE	0	0	0	0	0	1127		1127
	30R	21050007	Central Kakaako				7,030				OFFICES	0	0	0	844	0	0		844
	30R	21050007	Central Kakaako						4,029		WAREHOUSE	0	0	0	0	0	371		371
	30R	21050009	Central Kakaako				1,225				OFFICES	0	0	0	147	0	0		147
	30R	21050011	Central Kakaako				1,200				OFFICES	0	0	0	144	0	0		144
	30R	21050011	Central Kakaako						14,550		WAREHOUSE	0	0	0	0	0	1339		1339
	30R	21050012	Central Kakaako				1,488				OFFICES	0	0	0	179	0	0		179
	30R	21050012	Central Kakaako								PARKING PAR/ENCL	0	0	0	0	0	0		0
	28	21050016	Central Kakaako						6,816		WAREHOUSE	0	0	0	0	0	628		628
	28	21050017	Central Kakaako						5,150		WAREHOUSE	0	0	0	0	0	474		474
	28	21050018	Central Kakaako				6,300				OFFICES	0	0	0	756	0	0		756

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Land Use: Existing Condition												Domestic Water Consumption							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential 500 gal/unit	MF Residential 200 gal/unit	Hotel 350 gal/unit	Civil / Office 120 gal/1000 sf	Commercial 300 gal/1000 sf	General / Light Industry 92 gal/1000 sf	Other gal	Average Day Flow gpd
				units	units	units	SF	SF	SF	SF									
	28	21050019 Central Kakaako							2,436		AUTO PARTS/SERVICE	0	0	0	0	0	225		225
	28	21050020 Central Kakaako							2,772		AUTO PARTS/SERVICE	0	0	0	0	0	256		256
	28	21050021 Central Kakaako							1,609		WAREHOUSE	0	0	0	0	0	149		149
	28	21050022 Central Kakaako							2,500		AUTO PARTS/SERVICE	0	0	0	0	0	230		230
	28	21050023 Central Kakaako							5,000		AUTO PARTS/SERVICE	0	0	0	0	0	460		460
	28	21050024 Central Kakaako					320				OFFICES	0	0	0	39	0	0		39
	28	21050027 Central Kakaako						720			MEZZ DISPLAY SALES	0	0	0	0	216	0		216
	28	21050027 Central Kakaako							2,850		WAREHOUSE	0	0	0	0	0	263		263
	28	21050028 Central Kakaako						1,388			MEZZ DISPLAY SALES	0	0	0	0	417	0		417
	28	21050028 Central Kakaako					1,388				OFFICES	0	0	0	167	0	0		167
	28	21050028 Central Kakaako							8,200		WAREHOUSE	0	0	0	0	0	755		755
	28	21050030 Central Kakaako							9,750		LIGHT MANUFACTURING	0	0	0	0	0	897		897
	28	21050030 Central Kakaako							8,000		WAREHOUSE	0	0	0	0	0	736		736
	28	21050031 Central Kakaako						1,207			RETAIL STORE	0	0	0	0	363	0		363
	28	21050031 Central Kakaako							2,289		WAREHOUSE	0	0	0	0	0	211		211
	28	21050032 Central Kakaako						4,319			RETAIL STORE	0	0	0	0	1296	0		1296
	28	21050033 Central Kakaako					240				MEZZ ENCL OFFICE	0	0	0	29	0	0		29
	28	21050033 Central Kakaako							2,104		WAREHOUSE	0	0	0	0	0	194		194
	28	21050034 Central Kakaako								2,116	VETENARIAN	0	0	0	0	0	0	254 Office	254
	28	21050034 Central Kakaako							4,644		WAREHOUSE	0	0	0	0	0	428		428
	28	21050035 Central Kakaako							6,000		WAREHOUSE	0	0	0	0	0	552		552
	28	21050036 Central Kakaako					557				OFFICES	0	0	0	67	0	0		67
	28	21050036 Central Kakaako							6,422		WAREHOUSE	0	0	0	0	0	591		591
	28	21050037 Central Kakaako			1						APARTMENT	0	200	0	0	0	0		200
	28	21050037 Central Kakaako					760				OFFICES	0	0	0	92	0	0		92
	28	21050038 Central Kakaako					440				MEZZ ENCL OFFICE	0	0	0	53	0	0		53
	28	21050039 Central Kakaako							3,772		WAREHOUSE	0	0	0	0	0	348		348
	28	21050042 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	28	21050042 Central Kakaako							7,300		WAREHOUSE	0	0	0	0	0	672		672
	29	21050043 Central Kakaako					905				MEZZ ENCL OFFICE	0	0	0	109	0	0		109
	29	21050043 Central Kakaako							3,761		WAREHOUSE	0	0	0	0	0	347		347
	29	21050045 Central Kakaako							2,576		AUTO PARTS/SERVICE	0	0	0	0	0	237		237
	29	21050046 Central Kakaako							2,972		AUTO PARTS/SERVICE	0	0	0	0	0	274		274
	29	21050049 Central Kakaako					1,600				MEZZ ENCL OFFICE	0	0	0	192	0	0		192
	29	21050048 Central Kakaako							4,050		WAREHOUSE	0	0	0	0	0	373		373
	29	21050049 Central Kakaako			2						APARTMENT	0	400	0	0	0	0		400
	29	21050052 Central Kakaako					3,096				BANK/SAVINGS INST	0	0	0	372	0	0		372
	29	21050052 Central Kakaako					6,943				MEZZ ENCL OFFICE	0	0	0	834	0	0		834
	28	21050054 Central Kakaako						7,150			RETAIL STORE	0	0	0	0	2145	0		2145
	28	21050055 Central Kakaako							2,000		WAREHOUSE	0	0	0	0	0	184		184
	29	21050056 Central Kakaako							2,075		AUTO PARTS/SERVICE	0	0	0	0	0	191		191
	28	21050057 Central Kakaako							3,000		WAREHOUSE	0	0	0	0	0	276		276
	30R	21050058 Central Kakaako							5,677		LIGHT MANUFACTURING	0	0	0	0	0	523		523
	28	21050059 Central Kakaako							2,900		LIGHT MANUFACTURING	0	0	0	0	0	267		267
	28	21050060 Central Kakaako							960		WAREHOUSE	0	0	0	0	0	89		89
	HH 5	21050061 Pauahi						12,800			RETAIL STORE	0	0	0	0	3840	0		3840
	HH 5	21050061 Pauahi							15,429		WAREHOUSE	0	0	0	0	0	1420		1420
	HH 5	21050062 Pauahi								4,808	RESTAURANT	0	0	0	0	0	0	1443 Commercial	1443
	HH 5	21050062 Pauahi							4,808		WAREHOUSE	0	0	0	0	0	443		443
KAUHALE Kaka'ako	30R	21050070 Central Kakaako			269						APARTMENT	0	53800	0	0	0	0		53800
KAUHALE Kaka'ako	30R	21050070 Central Kakaako								7,108	SCHOOL	0	0	0	0	0	0	5340 60 gal/student	5340
KAUHALE Kaka'ako	30R	21050070 Central Kakaako					3,763				OFFICES	0	0	0	452	0	0		452
KAUHALE Kaka'ako	30R	21050070 Central Kakaako						220			CONVENIENCE STORE	0	0	0	0	66	0		66
KAUHALE Kaka'ako	30R	21050070 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	44	21051001 Pauahi					9,128				MEZZ ENCL OFFICE	0	0	0	1096	0	0		1096
	44	21051002 Pauahi							10,775		AUTO PARTS/SERVICE	0	0	0	0	0	992		992
	44	21051002 Pauahi					16,000				OFFICES	0	0	0	1920	0	0		1920
	44	21051002 Pauahi							15,916		WAREHOUSE	0	0	0	0	0	1465		1465
	43	21051007 Pauahi					18,028				OFFICES	0	0	0	2164	0	0		2164
	43	21051010 Pauahi							7,589		WAREHOUSE	0	0	0	0	0	699		699
	43	21051011 Pauahi							17,000		WAREHOUSE	0	0	0	0	0	1564		1564
	43	21051012 Pauahi					1,480				OFFICES	0	0	0	178	0	0		178
	43	21051012 Pauahi							29,687		WAREHOUSE	0	0	0	0	0	2732		2732
POHULANI	43	21051013 Pauahi			262						APARTMENT	0	52400	0	0	0	0		52400
	43	21051018 Pauahi					2,592				MEZZ ENCL OFFICE	0	0	0	312	0	0		312
	43	21051018 Pauahi							6,570		WAREHOUSE	0	0	0	0	0	605		605
	43	21051031 Pauahi					3,259				OFF ENCL WAREHSE	0	0	0	392	0	0		392

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				units	units	units	SF	SF	SF	SF									
	43	21051033 Pauahi			3						APARTMENT	0	600	0	0	0	0		600
	43	21051033 Pauahi					47,715				OFFICES	0	0	0	5726	0	0		5726
	43	21051033 Pauahi								16,470	RACQUET BALL COURT	0	0	0	0	0	0	4941 Commercial	4941
NĀ LE HULU KŪPUNA	44	21051038 Pauahi			76						APARTMENT	0	15200	0	0	0	0		15200
NĀ LE HULU KŪPUNA	44	21051038 Pauahi					1,995				OFFICES	0	0	0	240	0	0		240
LIBRARY WAREHOUSE /	46	21051041 Pauahi							18,000		WAREHOUSE	0	0	0	0	0	1656		1656
Halekauwila Place	46	21051042 Pauahi			203						APARTMENT	0	40600	0	0	0	0		40600
	48N (not HH)	21052001 Pauahi					4,340				MEZZ ENCL OFFICE	0	0	0	521	0	0		521
	48N (not HH)	21052001 Pauahi							23,334		WAREHOUSE	0	0	0	0	0	2147		2147
	48N (not HH)	21052002 Pauahi					405				OFF ENCL WAREHSE	0	0	0	49	0	0		49
	48N (not HH)	21052002 Pauahi							3,080		WAREHOUSE	0	0	0	0	0	284		284
	48N (not HH)	21052003 Pauahi					312				MEZZ ENCL OFFICE	0	0	0	38	0	0		38
	48N (not HH)	21052003 Pauahi							1,968		WAREHOUSE	0	0	0	0	0	182		182
	48N (not HH)	21052005 Pauahi							6,320		WAREHOUSE	0	0	0	0	0	582		582
	48N (not HH)	21052007 Pauahi					280				OFF ENCL WAREHSE	0	0	0	34	0	0		34
	48N (not HH)	21052007 Pauahi							6,222		WAREHOUSE	0	0	0	0	0	573		573
	48N (not HH)	21052008 Pauahi					16,800				OFFICES	0	0	0	2016	0	0		2016
	HH 5	21052010 Pauahi					4,992				OFFICES	0	0	0	600	0	0		600
	HH 5	21052011 Pauahi							8,452		MINI-WAREHOUSE	0	0	0	0	0	778		778
	HH 5	21052012 Pauahi					1,618				OFFICES	0	0	0	195	0	0		195
	HH 5	21052012 Pauahi							32,998		WAREHOUSE	0	0	0	0	0	3036		3036
	48N (not HH)	21052013 Pauahi							11,978		WAREHOUSE	0	0	0	0	0	1102		1102
	HH 5	21052017 Pauahi					3,530				MEZZ ENCL OFFICE	0	0	0	424	0	0		424
	HH 5	21052017 Pauahi							4,340		WAREHOUSE	0	0	0	0	0	400		400
	HH 5	21052020 Pauahi					16,936				OFFICES	0	0	0	2033	0	0		2033
	HH 5	21052020 Pauahi						15,668			RETAIL STORE	0	0	0	0	4701	0		4701
	HH 5	21052024 Pauahi					10,403				OFFICES	0	0	0	1249	0	0		1249
	HH 5	21052027 Pauahi					4,936				OFFICES	0	0	0	593	0	0		593
	HH 5	21052027 Pauahi								4,936	RESTAURANT	0	0	0	0	0	0	1481 Commercial	1481
	HH 5	21052028 Pauahi					8,571				OFFICES	0	0	0	1029	0	0		1029
	HH 5	21052028 Pauahi							3,380		WAREHOUSE	0	0	0	0	0	311		311
	HH 5	21052031 Pauahi					2,800				MEZZ ENCL OFFICE	0	0	0	336	0	0		336
	HH 5	21052031 Pauahi							2,800		WAREHOUSE	0	0	0	0	0	258		258
	HH 5	21052032 Pauahi					10,000				OFFICES	0	0	0	1200	0	0		1200
	HH 5	21052033 Pauahi					3,240				OFF ENCL WAREHSE	0	0	0	389	0	0		389
	HH 5	21052034 Pauahi					740				MEZZ ENCL OFFICE	0	0	0	89	0	0		89
	HH 5	21052034 Pauahi							3,050		WAREHOUSE	0	0	0	0	0	281		281
	HH 5	21052035 Pauahi					4,300				OFFICES	0	0	0	516	0	0		516
	HH 5	21052036 Pauahi					10,320				OFFICES	0	0	0	1239	0	0		1239
	HH 5	21052038 Pauahi					4,000				OFF ENCL WAREHSE	0	0	0	480	0	0		480
	HH 5	21052039 Pauahi					680				OFFICES	0	0	0	82	0	0		82
	HH 5	21052039 Pauahi							8,000		WAREHOUSE	0	0	0	0	0	736		736
	HH 5	21052040 Pauahi							4,000		WAREHOUSE	0	0	0	0	0	368		368
	HH 5	21052042 Pauahi					4,640				MEZZ ENCL OFFICE	0	0	0	557	0	0		557
	HH 5	21052042 Pauahi					12,600				OFF ENCL WAREHSE	0	0	0	1512	0	0		1512
	HH 5	21052043 Pauahi					2,214				MEZZ ENCL OFFICE	0	0	0	266	0	0		266
	HH 5	21052043 Pauahi							12,600		WAREHOUSE	0	0	0	0	0	1160		1160
	HH 5	21052045 Pauahi						3,050			RETAIL STORE	0	0	0	0	915	0		915
	HH 5	21052046 Pauahi							9,271		WAREHOUSE	0	0	0	0	0	853		853
	HH 5	21052051 Pauahi					510				OFF ENCL WAREHSE	0	0	0	62	0	0		62
	HH 5	21052051 Pauahi							3,000		WAREHOUSE	0	0	0	0	0	276		276
	HH 5	21052052 Pauahi					720				OFFICES	0	0	0	87	0	0		87
	HH 5	21052052 Pauahi							2,700		WAREHOUSE	0	0	0	0	0	249		249
	HH 5	21052053 Pauahi							4,440		WAREHOUSE	0	0	0	0	0	409		409
	HH 5	21052054 Pauahi		1							SF HOME	500	0	0	0	0	0		500
	HH 5	21053001 Pauahi							50,880		WAREHOUSE	0	0	0	0	0	4681		4681
	HH 5	21053030 Pauahi						17,273			RETAIL STORE	0	0	0	0	5182	0		5182
	HH 5	21053030 Pauahi					14,096				OFFICES	0	0	0	1692	0	0		1692
	55 (KS D)	21053032 Pauahi							109,011		WAREHOUSE	0	0	0	0	0	10030		10030
	55 (KS D)	21053032 Pauahi						20,000			MEZZ DISPLAY SALES	0	0	0	0	6000	0		6000
	55 (KS D)	21053032 Pauahi								4,784	BAR LOUNGE	0	0	0	0	0	0	1436 Commercial	1436
	55 (KS D)	21053032 Pauahi					3,275				MEZZ ENCL OFFICE	0	0	0	393	0	0		393
	53	21054021 Pauahi							80,321		WAREHOUSE	0	0	0	0	0	7390		7390
	53	21054021 Pauahi					4,403				OFF ENCL WAREHSE	0	0	0	529	0	0		529
	53	21054021 Pauahi						40,941			RETAIL STORE	0	0	0	0	12283	0		12283
	53	21054021 Pauahi					11,150				OFFICES	0	0	0	1338	0	0		1338

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				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
ONE WATERFRONT TOWERS	52X	21054022 Pauahi					49,891				OFFICES	0	0	0	5987	0	0		5987
ONE WATERFRONT TOWERS	52X	21054022 Pauahi			306						APARTMENT	0	61200	0	0	0	0		61200
	52 (KS B)	21054025 Pauahi							40,728		WAREHOUSE	0	0	0	0	0	3747		3747
	52 (KS B)	21054025 Pauahi					9,940				OFF ENCL WAREHSE	0	0	0	1193	0	0		1193
	52 (KS B)	21054025 Pauahi						18,373			RETAIL STORE	0	0	0	0	5512	0		5512
	52 (KS B)	21054027 Pauahi								17,000	SCHOOL	0	0	0	0	0	0	12780 60 gal/student	12780
	52 (KS B)	21054027 Pauahi					3,000				MEZZ ENCL OFFICE	0	0	0	360	0	0		360
	52 (KS B)	21054028 Pauahi							24,600		WAREHOUSE	0	0	0	0	0	2264		2264
	52 (KS B)	21054028 Pauahi					1,300				OFF ENCL WAREHSE	0	0	0	156	0	0		156
	54 (KS C)	21054036 Pauahi							55,926		WAREHOUSE	0	0	0	0	0	5146		5146
	59	21055001 Pauahi						5,054			RETAIL STORE	0	0	0	0	1517	0		1517
	59	21055002 Pauahi					9,861				AUTO SHOWROOM/OFFICE	0	0	0	1184	0	0		1184
	59	21055002 Pauahi							2,565		AUTO PARTS/SERVICE	0	0	0	0	0	236		236
	58	21055003 Pauahi						5,480			RETAIL STORE	0	0	0	0	1644	0		1644
	58	21055003 Pauahi							8,760		WAREHOUSE	0	0	0	0	0	806		806
	58	21055003 Pauahi					5,480				MEZZ ENCL OFFICE	0	0	0	658	0	0		658
THE COLLECTION	57	21055004 Pauahi			467			12,987			APARTMENT/COMMERCIAL	0	93400	0	0	3897	0		97297
	58	21055006 Pauahi							6,970		WAREHOUSE	0	0	0	0	0	642		642
	58	21055006 Pauahi					7,200				OFFICES	0	0	0	864	0	0		864
	58	21055021 Pauahi					22,128				OFFICES	0	0	0	2656	0	0		2656
	58	21055026 Pauahi						2,420			RETAIL STORE	0	0	0	0	726	0		726
	59	21055032 Pauahi							4,800		WAREHOUSE	0	0	0	0	0	442		442
	59	21055032 Pauahi					200				OFFICES	0	0	0	24	0	0		24
	59	21055033 Pauahi							7,260		WAREHOUSE	0	0	0	0	0	668		668
	59	21055034 Pauahi						4,961			RETAIL STORE	0	0	0	0	1489	0		1489
	59	21055035 Pauahi							5,360		WAREHOUSE	0	0	0	0	0	494		494
	58	21055038 Pauahi					10,644				OFFICES	0	0	0	1278	0	0		1278
	58	21055038 Pauahi							20,366		WAREHOUSE	0	0	0	0	0	1874		1874
	58	21055038 Pauahi					1,925				MEZZ ENCL OFFICE	0	0	0	231	0	0		231
	HH 5	21056001 Pauahi					34,376				OFFICES	0	0	0	4126	0	0		4126
	HH 5	21056001 Pauahi					7,136				BANK/SAVINGS INST	0	0	0	857	0	0		857
	61	21056002 Pauahi					5,256				OFFICES	0	0	0	631	0	0		631
	61	21056002 Pauahi							12,382		WAREHOUSE	0	0	0	0	0	1140		1140
	60	21056003 Pauahi						24,000			RETAIL STORE	0	0	0	0	7200	0		7200
	60	21056004 Pauahi							5,324		WAREHOUSE	0	0	0	0	0	490		490
	60	21056004 Pauahi					1,217				OFF ENCL WAREHSE	0	0	0	147	0	0		147
	60	21056004 Pauahi						12,200			AUTO SHOWROOM/OFFICE	0	0	0	0	3660	0		3660
	60	21056004 Pauahi							12,870		AUTO PARTS/SERVICE	0	0	0	0	0	1185		1185
	61	21056007 Pauahi					20,812				OFFICES	0	0	0	2498	0	0		2498
	61	21056008 Pauahi					1,654				OFFICES	0	0	0	199	0	0		199
	61	21056008 Pauahi							16,037		AUTO PARTS/SERVICE	0	0	0	0	0	1476		1476
	64 (HH 2)	23001005 Auahi						2,970			MEZZ DISPLAY SALES	0	0	0	0	891	0		891
	64 (HH 2)	23001005 Auahi					3,717				MEZZ ENCL OFFICE	0	0	0	447	0	0		447
	64 (HH 2)	23001005 Auahi									PARK STRUCTURE	0	0	0	0	0	0		0
	64 (HH 2)	23001005 Auahi								1,761	RESTAURANT	0	0	0	0	0	0	529 Commercial	529
	64 (HH 2)	23001005 Auahi						110,307			RETAIL STORE	0	0	0	0	33093	0		33093
	62 (HH 1)	23002001 Auahi						81,945			RETAIL STORE	0	0	0	0	24584	0		24584
	62 (HH 1)	23002001 Auahi							80,840		WAREHOUSE	0	0	0	0	0	7438		7438
	62 (HH 1)	23002002 Auahi								7,481	RESTAURANT	0	0	0	0	0	0	2245 Commercial	2245
	62 (HH 1)	23002057 Auahi						23,567			RETAIL STORE	0	0	0	0	7071	0		7071
	62 (HH 1)	23002058 Auahi					1,404				OFF ENCL WAREHSE	0	0	0	169	0	0		169
	62 (HH 1)	23002058 Auahi							5,594		WAREHOUSE	0	0	0	0	0	515		515
	62 (HH 1)	23002059 Auahi					64,561				DEPARTMENT STORE	0	0	0	7748	0	0		7748
	62 (HH 1)	23002059 Auahi							17,435		WAREHOUSE	0	0	0	0	0	1605		1605
	62 (HH 1)	23002066 Auahi							2,458		WAREHOUSE	0	0	0	0	0	227		227
	62 (HH 1)	23002069 Auahi							4,000		WAREHOUSE	0	0	0	0	0	368		368
	62 (HH 1)	23002104 Auahi									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	62 (HH 1)	23002104 Auahi								86,676	CINEMA	0	0	0	0	0	0	26003 Commercial	26003
1	62 (HH 1)	23002104 Auahi								38,700	RESTAURANT	0	0	0	0	0	0	11610 Commercial	11610
	62 (HH 1)	23002104 Auahi						27,066			RETAIL STORE	0	0	0	0	8120	0		8120
	34	23003004 Central Kakaako						2,900			MEZZ DISPLAY SALES	0	0	0	0	870	0		870
	34	23003004 Central Kakaako					2,900				OFFICES	0	0	0	348	0	0		348
	34	23003005 Central Kakaako					3,249				OFFICES	0	0	0	390	0	0		390
	34	23003005 Central Kakaako							1,000		WAREHOUSE	0	0	0	0	0	92		92
	34	23003006 Central Kakaako							2,790		WAREHOUSE	0	0	0	0	0	257		257

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Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential 500	MF Residential 200	Hotel 350	Civil / Office 120	Commercial 300	General / Light Industry 92	Other	Average Day Flow
				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
	34	23003007 Central Kakaako			2						APARTMENT	0	400	0	0	0	0		400
	34	23003008 Central Kakaako					21,888				MINI-WAREHOUSE	0	0	0	2627	0	0		2627
	34	23003008 Central Kakaako					2,786				OFF ENCL WAREHSE	0	0	0	335	0	0		335
	34	23003008 Central Kakaako							21,207		WAREHOUSE	0	0	0	0	0	1952		1952
	34	23003011 Central Kakaako					1,732				OFF ENCL WAREHSE	0	0	0	208	0	0		208
	34	23003011 Central Kakaako								3,000	RACQUET BALL COURT	0	0	0	0	0	0	900 Commercial	900
	34	23003012 Central Kakaako							2,784		WAREHOUSE	0	0	0	0	0	257		257
	34	23003013 Central Kakaako					3,000				OFFICES	0	0	0	360	0	0		360
	34	23003014 Central Kakaako										0	0	0	0	0	0		0
	34	23003015 Central Kakaako					15,000				OFFICES	0	0	0	1800	0	0		1800
KAMAKEE VISTA	34	23003018 Central Kakaako			226						APARTMENT	0	45200	0	0	0	0		45200
KAMAKEE VISTA	34	23003018 Central Kakaako					736				MEZZ ENCL OFFICE	0	0	0	89	0	0		89
KAMAKEE VISTA	34	23003018 Central Kakaako					15,285				OFFICES	0	0	0	1835	0	0		1835
KAMAKEE VISTA	34	23003018 Central Kakaako									PARKING PAR/ENCL	0	0	0	0	0	0		0
KAMAKEE VISTA	34	23003018 Central Kakaako								9,059	SCHOOL	0	0	0	0	0	0	6840 60 gal/student	6840
	32	23003019 Central Kakaako							1,792		WAREHOUSE	0	0	0	0	0	165		165
	32	23003020 Central Kakaako					969				MEZZ ENCL OFFICE	0	0	0	117	0	0		117
	32	23003020 Central Kakaako							9,969		WAREHOUSE	0	0	0	0	0	918		918
	32	23003021 Central Kakaako							3,500		WAREHOUSE	0	0	0	0	0	322		322
	32	23003022 Central Kakaako						2,472			MEZZ DISPLAY SALES	0	0	0	0	742	0		742
	32	23003022 Central Kakaako					948				MEZZ ENCL OFFICE	0	0	0	114	0	0		114
	32	23003022 Central Kakaako					556				OFF ENCL WAREHSE	0	0	0	67	0	0		67
	32	23003022 Central Kakaako							7,120		WAREHOUSE	0	0	0	0	0	656		656
	32	23003023 Central Kakaako							8,455		WAREHOUSE	0	0	0	0	0	778		778
	32	23003024 Central Kakaako					6,493				OFFICES	0	0	0	780	0	0		780
	32	23003024 Central Kakaako						5,513			RETAIL STORE	0	0	0	0	1654	0		1654
	32	23003026 Central Kakaako							4,018		LIGHT MANUFACTURING	0	0	0	0	0	370		370
	32	23003026 Central Kakaako					690				MEZZ ENCL OFFICE	0	0	0	83	0	0		83
	32	23003026 Central Kakaako								1,890	RESTAURANT	0	0	0	0	0	0	567 Commercial	567
	32	23003028 Central Kakaako							2,940		WAREHOUSE	0	0	0	0	0	271		271
	32	23003030 Central Kakaako		1							SF HOME	500	0	0	0	0	0		500
	32	23003031 Central Kakaako					312				MEZZ ENCL OFFICE	0	0	0	38	0	0		38
	32	23003031 Central Kakaako					572				OFFICES	0	0	0	69	0	0		69
	32	23003031 Central Kakaako							1,628		WAREHOUSE	0	0	0	0	0	150		150
	32	23003032 Central Kakaako			1						APARTMENT	0	200	0	0	0	0		200
	32	23003032 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	32	23003032 Central Kakaako					2,526				OFFICES	0	0	0	304	0	0		304
	33	23003037 Central Kakaako							8,550		WAREHOUSE	0	0	0	0	0	787		787
	33	23003038 Central Kakaako					2,800				MEZZ ENCL OFFICE	0	0	0	336	0	0		336
	33	23003038 Central Kakaako					2,800				OFF ENCL WAREHSE	0	0	0	336	0	0		336
	33	23003038 Central Kakaako							13,680		WAREHOUSE	0	0	0	0	0	1259		1259
	33	23003043 Central Kakaako					24,064				OFFICES	0	0	0	2888	0	0		2888
	33	23003046 Central Kakaako							4,414		WAREHOUSE	0	0	0	0	0	407		407
	33	23003047 Central Kakaako							3,000		WAREHOUSE	0	0	0	0	0	276		276
	33	23003048 Central Kakaako							3,800		WAREHOUSE	0	0	0	0	0	350		350
	33	23003049 Central Kakaako					3,936				OFFICES	0	0	0	473	0	0		473
	33	23003049 Central Kakaako						3,936			RETAIL STORE	0	0	0	0	1181	0		1181
	33	23003059 Central Kakaako							27,158		WAREHOUSE	0	0	0	0	0	2499		2499
	31	23003061 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	31	23003061 Central Kakaako					4,199				OFFICES	0	0	0	504	0	0		504
	31	23003061 Central Kakaako								1,409	RESTAURANT	0	0	0	0	0	0	423 Commercial	423
	31	23003062 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	31	23003062 Central Kakaako							7,500		WAREHOUSE	0	0	0	0	0	690		690
	31	23003063 Central Kakaako					480				OFF ENCL WAREHSE	0	0	0	58	0	0		58
	31	23003063 Central Kakaako							1,920		WAREHOUSE	0	0	0	0	0	177		177
	31	23003064 Central Kakaako							10,000		WAREHOUSE	0	0	0	0	0	920		920
	31	23003065 Central Kakaako					1,446				OFFICES	0	0	0	174	0	0		174
	31	23003065 Central Kakaako							2,644		WAREHOUSE	0	0	0	0	0	244		244
	31	23003066 Central Kakaako							6,500		WAREHOUSE	0	0	0	0	0	598		598
	31	23003067 Central Kakaako					7,530				MEZZ ENCL OFFICE	0	0	0	904	0	0		904
	31	23003067 Central Kakaako					2,244				OFF ENCL WAREHSE	0	0	0	270	0	0		270
	31	23003067 Central Kakaako							12,504		WAREHOUSE	0	0	0	0	0	1151		1151
	31	23003068 Central Kakaako					1,600				OFF ENCL WAREHSE	0	0	0	192	0	0		192
	31	23003068 Central Kakaako							3,680		WAREHOUSE	0	0	0	0	0	339		339
	31	23003069 Central Kakaako					1,520				MEZZ ENCL OFFICE	0	0	0	183	0	0		183
	31	23003069 Central Kakaako							3,560		WAREHOUSE	0	0	0	0	0	328		328
	20	23003071 Kapiolani					1,287				MEZZ ENCL OFFICE	0	0	0	155	0	0		155

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				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
	20	23003071 Kapiolani					2,803				MEZZ ENCL OFFICE	0	0	0	337	0	0		337
	20	23003071 Kapiolani							7,127		WAREHOUSE	0	0	0	0	0	656		656
909 Kapiolani	20	23003073 Kapiolani			228						APARTMENT	0	45600	0	0	0	0		45600
909 Kapiolani	20	23003073 Kapiolani					3,923				OFFICES	0	0	0	471	0	0		471
909 Kapiolani	20	23003073 Kapiolani							4,838		WAREHOUSE	0	0	0	0	0	446		446
	20	23003074 Kapiolani							1,680		AUTO PARTS/SERVICE	0	0	0	0	0	155		155
	20	23003074 Kapiolani					1,000				OFFICES	0	0	0	120	0	0		120
	20	23003075 Kapiolani					16,990				MINI-WAREHOUSE	0	0	0	2039	0	0		2039
	31	23003078 Central Kakaako					2,684				OFF ENCL WAREHSE	0	0	0	323	0	0		323
	31	23003078 Central Kakaako							9,200		WAREHOUSE	0	0	0	0	0	847		847
	32	23003081 Central Kakaako					2,016				OFFICES	0	0	0	242	0	0		242
	32	23003083 Central Kakaako					720				OFF ENCL WAREHSE	0	0	0	87	0	0		87
	32	23003083 Central Kakaako							2,240		WAREHOUSE	0	0	0	0	0	207		207
	31	23003090 Central Kakaako					1,250				OFFICES	0	0	0	150	0	0		150
	31	23003091 Central Kakaako								7,500	RESTAURANT	0	0	0	0	0	0	2250 Commercial	2250
	31	23003092 Central Kakaako							3,650		WAREHOUSE	0	0	0	0	0	336		336
	31	23003093 Central Kakaako					835				MEZZ ENCL OFFICE	0	0	0	101	0	0		101
	31	23003093 Central Kakaako							6,880		WAREHOUSE	0	0	0	0	0	633		633
	32	23003094 Central Kakaako					942				OFFICES	0	0	0	114	0	0		114
	32	23003094 Central Kakaako							2,880		WAREHOUSE	0	0	0	0	0	265		265
	32	23003095 Central Kakaako							1,035		WAREHOUSE	0	0	0	0	0	96		96
	20	23003097 Kapiolani					12,228				OFFICES	0	0	0	1468	0	0		1468
	20	23003098 Kapiolani					13,824				OFFICES	0	0	0	1659	0	0		1659
	20	23003099 Kapiolani					1,911				BANK/SAVINGS INST	0	0	0	230	0	0		230
	20	23003099 Kapiolani					1,620				OFFICES	0	0	0	195	0	0		195
PACIFICA HONOLULU	20	23003105 Kapiolani			489						APARTMENT	0	97800	0	0	0	0		97800
PACIFICA HONOLULU	20	23003105 Kapiolani						9,985			RETAIL STORE	0	0	0	0	2996	0		2996
	21	23004002 Kapiolani					7,210				OFFICES	0	0	0	866	0	0		866
	21	23004003 Kapiolani					15,388				OFFICES	0	0	0	1847	0	0		1847
	21	23004003 Kapiolani						3,721			RETAIL STORE	0	0	0	0	1117	0		1117
	21	23004007 Kapiolani								4,257	RESTAURANT	0	0	0	0	0	0	1278 Commercial	1278
	21	23004007 Kapiolani						4,257			RETAIL STORE	0	0	0	0	1278	0		1278
	21	23004010 Kapiolani								1,888	CAR WASH AUTOMATIC	0	0	0	0	0	0	567 Commercial	567
	21	23004010 Kapiolani							1,946		SERVICE STATION W/BAYS	0	0	0	0	0	180		180
	21	23004012 Kapiolani							8,792		WAREHOUSE	0	0	0	0	0	809		809
1133 WAIMANU	35	23004025 Central Kakaako			282						APARTMENT	0	56400	0	0	0	0		56400
	35	23004029 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	35	23004029 Central Kakaako					6,561				OFFICES	0	0	0	788	0	0		788
	35	23004031 Central Kakaako					576				OFFICES	0	0	0	70	0	0		70
	35	23004033 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	35	23004033 Central Kakaako					2,960				MEZZ ENCL OFFICE	0	0	0	356	0	0		356
	35	23004033 Central Kakaako					2,960				OFFICES	0	0	0	356	0	0		356
	35	23004033 Central Kakaako							7,790		WAREHOUSE	0	0	0	0	0	717		717
	35	23004034 Central Kakaako								1,994	RESTAURANT	0	0	0	0	0	0	599 Commercial	599
	36	23004035 Central Kakaako					5,839				OFF ENCL WAREHSE	0	0	0	701	0	0		701
	36	23004035 Central Kakaako					7,274				OFFICES	0	0	0	873	0	0		873
	36	23004035 Central Kakaako							38,790		WAREHOUSE	0	0	0	0	0	3569		3569
	21	23004037 Kapiolani					160				OFFICES	0	0	0	20	0	0		20
	21	23004039 Kapiolani							1,248		AUTO PARTS/SERVICE	0	0	0	0	0	115		115
	36	23004048 Central Kakaako					2,130				OFF ENCL WAREHSE	0	0	0	256	0	0		256
	36	23004048 Central Kakaako							6,493		WAREHOUSE	0	0	0	0	0	598		598
	36	23004051 Central Kakaako					1,830				OFFICES	0	0	0	220	0	0		220
	36	23004051 Central Kakaako							2,688		WAREHOUSE	0	0	0	0	0	248		248
	36	23004069 Central Kakaako					900				OFF ENCL WAREHSE	0	0	0	108	0	0		108
	36	23004069 Central Kakaako							7,280		WAREHOUSE	0	0	0	0	0	670		670
	35	23004071 Central Kakaako						565			RETAIL STORE	0	0	0	0	170	0		170
HOKUA AT 1288 ALA MOANA	63E	23005001 Auahi					32,282				OFFICES	0	0	0	3874	0	0		3874
HOKUA AT 1288 ALA MOANA	63E	23005001 Auahi			248						APARTMENT	0	49600	0	0	0	0		49600
	65 (HH 4)	23005004 Auahi					22,687				OFFICES	0	0	0	2723	0	0		2723
	65 (HH 4)	23005004 Auahi						3,937			MEZZ DISPLAY SALES	0	0	0	0	1182	0		1182
	65 (HH 4)	23005006 Auahi						920			MEZZ DISPLAY SALES	0	0	0	0	276	0		276
	65 (HH 4)	23005006 Auahi									PARK STRUCTURE	0	0	0	0	0	0		0
	65 (HH 4)	23005006 Auahi						116,370			RETAIL STORE	0	0	0	0	34911	0		34911
	63H (HH 3)	23005013 Auahi						68,079			DEPARTMENT STORE	0	0	0	0	20424	0		20424
	63H (HH 3)	23005013 Auahi						6,081			MEZZ DISPLAY SALES	0	0	0	0	1825	0		1825

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				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
	63H (HH 3)	23005013 Auahi									PARK STRUCTURE	0	0	0	0	0	0		0
WARD VILLAGE SHOPS	63H (HH 3)	23005014 Auahi						129,778			DEPARTMENT STORE	0	0	0	0	38934	0		38934
	63H (HH 3)	23005019 Auahi						15,704			RETAIL STORE	0	0	0	0	4712	0		4712
1350 ALA MOANA	63E	23006001 Auahi			353						APARTMENT	0	70600	0	0	0	0		70600
NAURU TOWER	63E	23006003 Auahi							4,788		WAREHOUSE	0	0	0	0	0	441		441
NAURU TOWER	63E	23006003 Auahi					11,184				OFFICES	0	0	0	1343	0	0		1343
NAURU TOWER	63E	23006003 Auahi								10,740	RESTAURANT	0	0	0	0	0	0	3222 Commercial	3222
NAURU TOWER	63E	23006003 Auahi			430						APARTMENT	0	86000	0	0	0	0		86000
HAWAIKI TOWER	63E	23006004 Auahi					41,940				OFFICES	0	0	0	5033	0	0		5033
HAWAIKI TOWER	63E	23006004 Auahi			417						APARTMENT	0	83400	0	0	0	0		83400
KOOLANI	63E	23006014 Auahi			370						APARTMENT	0	74000	0	0	0	0		74000
KOOLANI	63E	23006014 Auahi					20,516				OFFICES	0	0	0	2462	0	0		2462
WAIHONUA	63E	23006017 Auahi			345						APARTMENT	0	69000	0	0	0	0		69000
	39	23007023 Central Kakaako					17,057				OFFICES	0	0	0	2047	0	0		2047
	39	23007026 Central Kakaako							2,512		WAREHOUSE	0	0	0	0	0	232		232
	39	23007027 Central Kakaako					7,628				OFFICES	0	0	0	916	0	0		916
	39	23007028 Central Kakaako								5,680	BAR LOUNGE	0	0	0	0	0	0	1704 Commercial	1704
	39	23007028 Central Kakaako							7,360		WAREHOUSE	0	0	0	0	0	678		678
	39	23007029 Central Kakaako					4,458				OFFICES	0	0	0	535	0	0		535
	36	23007033 Central Kakaako					1,470				OFF ENCL WAREHSE	0	0	0	177	0	0		177
	36	23007033 Central Kakaako							6,616		WAREHOUSE	0	0	0	0	0	609		609
	36	23007036 Central Kakaako					896				OFF ENCL WAREHSE	0	0	0	108	0	0		108
	36	23007036 Central Kakaako					896				OFFICES	0	0	0	108	0	0		108
	36	23007036 Central Kakaako							4,509		WAREHOUSE	0	0	0	0	0	415		415
	36	23007039 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	36	23007039 Central Kakaako							7,192		WAREHOUSE	0	0	0	0	0	662		662
	39	23007044 Central Kakaako					3,710				OFFICES	0	0	0	446	0	0		446
	39	23007045 Central Kakaako							8,460		WAREHOUSE	0	0	0	0	0	779		779
	39	23007049 Central Kakaako						2,045			RETAIL STORE	0	0	0	0	614	0		614
	39	23007049 Central Kakaako							18,240		WAREHOUSE	0	0	0	0	0	1679		1679
	38	23007054 Central Kakaako								1,288	RESTAURANT	0	0	0	0	0	0	387 Commercial	387
	38	23007054 Central Kakaako							1,664		WAREHOUSE	0	0	0	0	0	154		154
	38	23007056 Central Kakaako							4,051		WAREHOUSE	0	0	0	0	0	373		373
	38	23007057 Central Kakaako							14,960		MANUFACTURING	0	0	0	0	0	1377		1377
	38	23007057 Central Kakaako								28,140	RESTAURANT	0	0	0	0	0	0	8442 Commercial	8442
	38	23007061 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	38	23007061 Central Kakaako					2,100				MEZZ ENCL OFFICE	0	0	0	252	0	0		252
	38	23007061 Central Kakaako							4,500		WAREHOUSE	0	0	0	0	0	414		414
	38	23007062 Central Kakaako						1,200			MEZZ DISPLAY SALES	0	0	0	0	360	0		360
	38	23007062 Central Kakaako							8,228		WAREHOUSE	0	0	0	0	0	757		757
	38	23007063 Central Kakaako							8,000		WAREHOUSE	0	0	0	0	0	736		736
	37	23007064 Central Kakaako					1,584				AUTO SHOWROOM/OFFICE	0	0	0	191	0	0		191
	37	23007064 Central Kakaako							6,037		WAREHOUSE	0	0	0	0	0	556		556
	37	23007066 Central Kakaako					1,144				OFF ENCL WAREHSE	0	0	0	138	0	0		138
	37	23007066 Central Kakaako							6,608		WAREHOUSE	0	0	0	0	0	608		608
	37	23007067 Central Kakaako					910				OFF ENCL WAREHSE	0	0	0	110	0	0		110
	37	23007067 Central Kakaako							6,760		WAREHOUSE	0	0	0	0	0	622		622
	37	23007069 Central Kakaako					360				MEZZ ENCL OFFICE	0	0	0	44	0	0		44
	37	23007069 Central Kakaako					1,608				OFF ENCL WAREHSE	0	0	0	193	0	0		193
	37	23007069 Central Kakaako							32,137		WAREHOUSE	0	0	0	0	0	2957		2957
	37	23007078 Central Kakaako					2,577				OFFICES	0	0	0	310	0	0		310
	37	23007078 Central Kakaako							11,332		WAREHOUSE	0	0	0	0	0	1043		1043
	38	23007092 Central Kakaako								1,724	TAVERN/BAR	0	0	0	0	0	0	518 Commercial	518
	38	23007093 Central Kakaako					5,385				OFFICES	0	0	0	647	0	0		647
	38	23007093 Central Kakaako								5,385	RESTAURANT	0	0	0	0	0	0	1616 Commercial	1616
	23	23007098 Kapiolani								2,030	RESTAURANT	0	0	0	0	0	0	609 Commercial	609
	23	23007099 Kapiolani									PARK STRUCTURE	0	0	0	0	0	0		0
	23	23007100 Kapiolani					4,823				OFFICES	0	0	0	579	0	0		579
	23	23007107 Kapiolani					31,933				OFFICES	0	0	0	3832	0	0		3832
	23	23007107 Kapiolani									PARKING PAR/ENCL	0	0	0	0	0	0		0
	23	23007107 Kapiolani						19,864			RETAIL STORE	0	0	0	0	5960	0		5960
BLAISDELL CENTER	7B+C	23008002 Thomas Square									PARK STRUCTURE	0	0	0	0	0	0		0
	7B+C	23008003 Thomas Square								4,747	RESTAURANT	0	0	0	0	0	0	1425 Commercial	1425
MCKINLEY HIGH SCHOOL	7B+C	23009001 Thomas Square									SCHOOL	0	0	0	0	0	0		0
	12	23010001 Sheridan			2						APARTMENT	0	400	0	0	0	0		400
	12	23010002 Sheridan		1							SF HOME	500	0	0	0	0	0		500
	12	23010003 Sheridan		1							SF HOME	500	0	0	0	0	0		500

Table A: Population and Utility Demands - Existing Condition

Land Use: Existing Condition												Domestic Water Consumption							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential 500 gal/unit	MF Residential 200 gal/unit	Hotel 350 ga/unit	Civil / Office 120 gal/1000 sf	Commercial 300 gal/1000 sf	General / Light Industry 92 gal/1000 sf	Other gal	Average Day Flow gpd
				units	units	units	SF	SF	SF	SF									
	12	23010004	Sheridan		4						APARTMENT	0	800	0	0	0	0		800
	12	23010005	Sheridan		1						APARTMENT	0	200	0	0	0	0		200
	12	23010006	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	12	23010007	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	12	23010008	Sheridan	1							SF HOME	500	0	0	0	0	0		500
HAWAIIANA APTS	12	23010009	Sheridan		14						APARTMENT	0	2800	0	0	0	0		2800
RYCROFT MANOR	12	23010011	Sheridan		29						APARTMENT	0	5800	0	0	0	0		5800
	12	23010012	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	12	23010013	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010014	Sheridan		4						APARTMENT	0	800	0	0	0	0		800
	13	23010015	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010016	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	13	23010017	Sheridan		3						APARTMENT	0	600	0	0	0	0		600
	13	23010018	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010019	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010020	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	13	23010021	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	13	23010022	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010023	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	13	23010024	Sheridan		4						APARTMENT	0	800	0	0	0	0		800
	13	23010025	Sheridan		4						APARTMENT	0	800	0	0	0	0		800
	13	23010026	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010027	Sheridan		1						APARTMENT	0	200	0	0	0	0		200
MOANA PACIFIC	22	23010028	Kapiolani		1,404						APARTMENT	0	280800	0	0	0	0		280800
	13	23010083	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010092	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010093	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	13	23010094	Sheridan		3						APARTMENT	0	600	0	0	0	0		600
	13	23010096	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	13	23010097	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	13	23010098	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	12	23010099	Sheridan		1						APARTMENT	0	200	0	0	0	0		200
	12	23010100	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	12	23010101	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	12	23010102	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	12	23010103	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	12	23010104	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	12	23010105	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	12	23010106	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	12	23010107	Sheridan	1							SF HOME	500	0	0	0	0	0		500
Honolulu Design Center	22	23010111	Kapiolani							19,751	RESTAURANT	0	0	0	0	0	0	5926 Commercial	5926
Honolulu Design Center	22	23010111	Kapiolani					60,112			RETAIL STORE	0	0	0	0	18034	0		18034
	10	23011002	Sheridan				460				LIBRARY	0	0	0	56	0	0		56
	10	23011002	Sheridan				969				MEZZ ENCL OFFICE	0	0	0	117	0	0		117
	10	23011002	Sheridan				2,766				OFFICES	0	0	0	332	0	0		332
	10	23011002	Sheridan							5,207	RELIGIOUS INST	0	0	0	0	0	0	1563 Commercial	1563
	10	23011002	Sheridan							28,573	SCHOOL	0	0	0	0	0	0	21480 60 gal/student	21480
	10	23011002	Sheridan				7,058				SOCIAL/FRATERNAL HALL	0	0	0	847	0	0		847
	8	23011003	Sheridan				955				OFFICES	0	0	0	115	0	0		115
	8	23011003	Sheridan					3,215			RETAIL STORE	0	0	0	0	965	0		965
	8	23011004	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	8	23011005	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011006	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011007	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011008	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011009	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011010	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011011	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	8	23011012	Sheridan								PARKING PAR/ENCL	0	0	0	0	0	0		0
	8	23011012	Sheridan					5,228			RETAIL STORE	0	0	0	0	1569	0		1569
	8	23011013	Sheridan					5,041			RETAIL STORE	0	0	0	0	1513	0		1513
	8	23011014	Sheridan					1,138			RETAIL STORE	0	0	0	0	342	0		342
	8	23011015	Sheridan				1,920				OFFICES	0	0	0	231	0	0		231
	8	23011015	Sheridan					1,441			RETAIL STORE	0	0	0	0	433	0		433
	8	23011016	Sheridan					2,400			RETAIL STORE	0	0	0	0	720	0		720
	8	23011017	Sheridan							1,650	RESTAURANT	0	0	0	0	0	0	495 Commercial	495
	8	23011018	Sheridan				1,281				OFFICES	0	0	0	154	0	0		154

Table A: Population and Utility Demands - Existing Condition

Land Use: Existing Condition												Domestic Water Consumption							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential 500 gal/unit	MF Residential 200 gal/unit	Hotel 350 ga/unit	Civil / Office 120 gal/1000 sf	Commercial 300 gal/1000 sf	General / Light Industry 92 gal/1000 sf	Other gal	Average Day Flow gpd
				units	units	units	SF	SF	SF	SF									
	8	23011018	Sheridan					3,294			RETAIL STORE	0	0	0	0	989	0		989
	8	23011019	Sheridan				2,500				OFFICES	0	0	0	300	0	0		300
	8	23011019	Sheridan					2,800			RETAIL STORE	0	0	0	0	840	0		840
	9	23011021	Sheridan		4						APARTMENT	0	800	0	0	0	0		800
	9	23011022	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011023	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011024	Sheridan	1							SF HOME	500	0	0	0	0	0		500
ELMS	9	23011025	Sheridan		63						APARTMENT	0	12600	0	0	0	0		12600
	9	23011029	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	9	23011030	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011031	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011032	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011033	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	9	23011034	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011035	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011036	Sheridan		1						APARTMENT	0	200	0	0	0	0		200
	9	23011037	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	11	23011038	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	11	23011039	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	11	23011040	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	11	23011041	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	11	23011042	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	11	23011043	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	11	23011044	Sheridan		4						APARTMENT	0	800	0	0	0	0		800
	10	23011045	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	10	23011046	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	10	23011047	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	10	23011048	Sheridan		4						APARTMENT	0	800	0	0	0	0		800
	10	23011049	Sheridan		2						APARTMENT	0	400	0	0	0	0		400
	10	23011050	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	10	23011051	Sheridan		4						APARTMENT	0	800	0	0	0	0		800
	11	23011053	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	10	23011054	Sheridan	1							SF HOME	500	0	0	0	0	0		500
											TOTALS	**22,500**	**1,971,400**	**-**	**306,341**	**352,727**	**200,465**	**161,974**	**3,015,407**
690 Pohukaina	46	21051041	Pauahi		851		19,000	76,000			APARTMENT	0	170200	0	2280	22800	0		195280

Table B: Population and Utility Demands - Future Baseline

Land Use: Future Baseline												Domestic Water Consumption					
Block	HCDA Neighborhood	MF Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	Surface Parking SF	Garage Parking SF	MF Residential 200 gal/unit	Hotel 350 gal/unit	Civil / Office 120 gal/1000 sf	Commercial 300 gal/1000 sf	General / Light Industry 92 gal/1000 sf	Average Day Flow gpd
1	Civic Center	115	-	191,734	-	211,496	-	43,841	6,650	-	248,489	23,036	-	25,380	13,153	612	62,181
2	Civic Center	369	-	507,690	-	124,100	9,136	62,636	-	15,390	242,632	73,770	-	15,989	18,791	-	108,550
3	Civic Center	84	-	139,897	-	62,776	-	-	-	-	-	16,808	-	7,534	-	-	24,342
4	Civic Center	33	-	55,451	-	7,154	101,375	-	-	-	183,233	6,662	-	13,024	-	-	19,686
5	Civic Center	86	-	143,605	-	-	8,281	28,320	-	-	108,000	17,254	-	994	8,496	-	26,744
6		407						86,000				81,400			25,800		107,200
8	Sheridan	84	-	139,482	-	-	39,561	-	-	-	-	16,758	-	4,748	-	-	21,506
9	Sheridan	65	-	108,311	-	-	-	-	-	-	18,940	13,013	-	-	-	-	13,013
10	Sheridan	40	-	64,881	-	73,871	-	-	-	-	-	7,995	-	8,865	-	-	16,860
11	Sheridan	26	-	42,600	-	-	-	-	-	-	-	5,118	-	-	-	-	5,118
12	Sheridan	75	-	124,372	-	-	-	-	-	-	-	14,943	-	-	-	-	14,943
13	Sheridan	147	-	244,849	-	-	-	10,078	-	-	156,317	29,418	-	-	3,024	-	32,442
14	Kapiolani	1,270	-	1,061,528	-	-	**21,000**	10,500	-	-	622,220	254,000	-	2,520	3,150	-	259,670
15	Kapiolani	97	-	161,119	-	12,602	289,843	73,038	-	-	237,920	19,358	-	36,294	21,912	-	77,564
16	Kapiolani	-	-	-	-	41,898	245,254	-	-	-	-	-	-	34,459	-	-	34,459
17	Kapiolani	176	-	166,007	-	-	3,470	38,164	71,720	-	245,892	35,200	-	417	11,450	6,599	53,666
18	Kapiolani	126	-	210,194	-	-	-	52,498	-	-	-	25,254	-	-	15,750	-	41,004
19	Kapiolani	189	-	313,910	-	-	158,868	75,127	-	-	349,045	37,715	-	19,065	22,539	-	79,319
20	Kapiolani	1,088	-	1,197,305	-	-	134,663	64,609	-	-	655,518	217,660	-	16,160	19,383	-	253,203
21	Kapiolani	130	-	216,240	-	-	141,344	78,860	-	-	135,768	25,980	-	16,962	23,658	-	66,600
22	Kapiolani	1,404	-	-	-	-	-	87,604	-	-	-	280,800	-	-	26,282	-	307,082
23	Kapiolani	-	-	-	-	-	159,447	50,583	-	-	169,460	-	-	19,134	15,175	-	34,309
24	Central Kakaako	167	-	277,370	-	-	160,570	5,000	55,000	-	253,142	33,325	-	19,269	1,500	5,060	59,154
25	Central Kakaako	15	-	25,000	-	-	20,000	5,000	100,000	-	48,969	3,004	-	2,400	1,500	9,200	16,104
26	Central Kakaako	126	-	210,000	-	-	49,227	5,000	95,000	-	119,760	25,231	-	5,908	1,500	8,740	41,379
27	Central Kakaako	-	-	-	-	-	71,475	5,000	36,255	-	56,381	-	-	8,577	1,500	3,336	13,413
28	Central Kakaako	24	-	40,000	-	9,590	62,420	27,010	95,000	-	96,449	4,806	-	8,642	8,103	8,740	30,291
29	Central Kakaako	-	-	-	-	-	-	10,000	90,000	-	32,432	-	-	-	3,000	8,280	11,280
31	Central Kakaako	64	-	106,836	-	-	43,577	10,000	65,756	-	84,286	12,836	-	5,230	3,000	6,050	27,116
32	Central Kakaako	64	-	106,831	-	-	-	10,000	74,202	-	58,741	12,835	-	-	3,000	6,827	22,662
33	Central Kakaako	118	-	195,674	-	-	103,323	10,000	69,471	-	149,405	23,510	-	12,399	3,000	6,392	45,301
34	Central Kakaako	226	-	181,976	-	209,391	42,436	15,664	-	-	112,032	45,200	-	30,220	4,700	-	80,120
35	Central Kakaako	282	-	255,996	-	15,760	31,680	5,960	-	-	-	56,400	-	5,693	1,788	-	63,881
36	Central Kakaako	305	-	507,952	-	-	-	20,000	-	-	159,643	61,029	-	-	6,000	-	67,029
37	Central Kakaako	110	-	182,953	-	-	-	25,253	-	-	69,091	21,981	-	-	7,576	-	29,557
38	Central Kakaako	-	-	-	-	-	187,361	5,000	62,454	-	-	-	-	22,484	1,500	5,746	29,730
39	Central Kakaako	-	-	-	-	-	200,000	5,000	90,000	-	157,666	-	-	24,000	1,500	8,280	33,780
40	Pauahi	**430**	-	-	-	-	-	**18,529**	-	-	-	86,000	-	-	5,559	-	91,559
41	Pauahi	154	-	257,090	-	-	30,291	43,212	-	-	124,256	30,888	-	3,635	12,964	-	47,487
42	Pauahi	110	-	182,988	-	-	317,986	79,025	-	-	264,000	21,985	-	38,159	23,708	-	83,852
43	Pauahi	280	-	340,555	-	-	70,065	32,933	-	-	224,515	55,949	-	8,408	9,880	-	74,237
44	Pauahi	214	-	356,900	-	-	-	41,999	-	-	236,406	42,880	-	-	12,600	-	55,480
46	Pauahi	**462**	-	-	-	-	**15,269**	**13,066**	-	-	**243,760**	92,400	-	1,833	3,920	-	98,153
47	Pauahi	-	-	-	-	947	-	-	-	-	-	-	-	114	-	-	114
51	Pauahi	-	-	-	-	-	632,055	237,265	-	-	-	-	-	75,847	71,180	-	147,027
53	Pauahi	153	-	254,312	-	-	307,424	77,606	-	-	392,795	30,555	-	36,891	23,282	-	90,728
57	Pauahi	**348**	-	-	-	-	-	12,987	-	-	-	69,600	-	-	3,897	-	73,497
58	Pauahi	159	-	264,061	-	-	200,005	44,400	-	-	298,740	31,726	-	24,001	13,320	-	69,047
59	Pauahi	149	-	247,483	-	-	146,224	36,556	-	-	173,530	29,734	-	17,547	10,967	-	58,248
60	Pauahi	121	-	201,120	-	-	136,505	27,301	-	-	208,008	24,164	-	16,381	8,191	-	48,736
61	Pauahi	185	-	308,025	-	-	250,655	50,131	-	-	386,364	37,008	-	30,079	15,040	-	82,127
30R	Central Kakaako	458	-	596,548	-	-	-	10,000	-	-	230,965	91,578	-	-	3,000	-	94,578
45 (KS A)	Pauahi	**348**	-	-	-	-	**1,299**	**9,091**	**2,597**	-	**159,127**	69,600	-	156	2,728	239	72,723
48N (not HH)	Pauahi	322	-	535,238	-	-	169,686	111,343	-	-	184,845	64,307	-	20,363	33,403	-	118,073
52 (KS B)	Pauahi	**114**	-	**188,953**	-	-	**3,389**	**23,722**	**6,778**	-	**74,578**	22,800	-	407	7,117	624	30,948
52X	Pauahi	**591**	-	**591,356**	-	-	-	-	-	-	**199,720**	118,200	-	-	-	-	118,200
54 (KS C)	Pauahi	332	-	552,031	-	-	8,767	61,366	17,533	-	**209,199**	66,325	-	1,052	18,410	1,614	87,401
55 (KS D)	Pauahi	118	-	196,781	-	-	8,610	60,270	17,220	-	**116,575**	23,643	-	1,034	18,081	1,585	44,343
63E	Auahi	2,163	-		-	-	105,922	15,528	-	-		432,600	-	12,711	4,659	-	449,970
62 (HH 1)																	485,324
63H (HH 3)																	110,827
64 (HH 2)																	199,548
65 (HH 4)																	169,229
6Kap	Kapiolani	38	-		-	-	-	3,616	-	-	-	7,600	-	-	1,085	-	8,685
6TS	Thomas Square	1,353	-	1,934,557	-	-	461,758	328,971	-	-	1,218,949	270,689	-	55,411	98,692	-	424,792
7B+C	Thomas Square	761	-	1,266,626	-	441,585	1,127,010	325,734	-	-	1,377,096	152,181	-	188,232	97,721	-	438,134
HH 5																	632,034
Average consumption rates for HHG developments provided by Wilson Okamoto Corporation																	
											TOTALS	**3,374,710** gpd	**-** gpd	**898,628** gpd	**777,134** gpd	**87,924** gpd	**6,735,357** gpd

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Table C: Population and Utility Demands - TOD Alternative A

Land Use: TOD Alternative A												Domestic Water Consumption					
Block	HCDA Neighborhood	MF Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	Surface Parking SF	Garage Parking SF	MF Residential 200 gal/unit	Hotel 350 gal/unit	Civil / Office 120 gal/1000 sf	Commercial 300 gal/1000 sf	General / Light Industry 92 gal/1000 sf	Average Daily Flow gpd
1	Civic Center	115	-	191,734	-	211,496	-	43,841	6,650	-	248,489	23,036	-	25,380	13,153	612	62,181
2	Civic Center	369	-	507,690	-	124,100	9,136	62,636	-	15,390	242,632	73,770	-	15,989	18,791	-	108,550
3	Civic Center	84	-	139,897	-	62,776	-	-	-	-	-	16,808	-	7,534	-	-	24,342
4	Civic Center	33	-	55,451	-	7,154	101,375	-	-	-	183,233	6,662	-	13,024	-	-	19,686
5	Civic Center	86	-	143,605	-	-	8,281	28,320	-	-	108,000	17,254	-	994	8,496	-	26,744
6		407						86,000				81,400			25,800		107,200
8	Sheridan	84	-	139,482	-	-	39,561	-	-	-	-	16,758	-	4,748	-	-	21,506
9	Sheridan	65	-	108,311	-	-	-	-	-	-	18,940	13,013	-	-	-	-	13,013
10	Sheridan	40	-	64,881	-	73,871	-	-	-	-	-	7,995	-	8,865	-	-	16,860
11	Sheridan	26	-	42,600	-	-	-	-	-	-	-	5,118	-	-	-	-	5,118
12	Sheridan	75	-	124,372	-	-	-	-	-	-	-	14,943	-	-	-	-	14,943
13	Sheridan	147	-	244,849	-	-	-	10,078	-	-	156,317	29,418	-	-	3,024	-	32,442
14	Kapiolani	1,270	-	1,061,528	-	-	**21,000**	10,500	-	-	**622,220**	254,000	-	2,520	3,150	-	259,670
15	Kapiolani	406	-	675,024	-	-	277,798	13,703	-	-	391,728	81,102	-	33,336	4,111	-	118,549
16	Kapiolani	-	-	-	-	41,898	245,254	-	-	-	-	-	-	34,459	-	-	34,459
17	Kapiolani	176	-	166,007	-	-	3,470	38,164	71,720	-	245,892	35,200	-	417	11,450	6,599	53,666
18	Kapiolani	126	-	210,194	-	-	-	52,498	-	-	-	25,254	-	-	15,750	-	41,004
19	Kapiolani	449	-	748,181	-	-	319,088	14,732	-	-	337,200	89,891	-	38,291	4,420	-	132,602
20	Kapiolani	1,088	-	1,197,305	-	-	134,663	64,609	-	-	655,518	217,660	-	16,160	19,383	-	253,203
21	Kapiolani	452	-	751,729	-	-	36,172	20,539	-	-	262,478	90,318	-	4,341	6,162	-	100,821
22	Kapiolani	1,404	-	-	-	-	-	87,604	-	-	358,508	280,800	-	-	26,282	-	307,082
23	Kapiolani	-	-	-	-	-	159,447	50,583	-	-	169,460	-	-	19,134	15,175	-	34,309
24	Central Kakaako	167	-	277,370	-	-	160,570	5,000	55,000	-	253,142	33,325	-	19,269	1,500	5,060	59,154
25	Central Kakaako	15	-	25,000	-	-	20,000	5,000	100,000	-	48,969	3,004	-	2,400	1,500	9,200	16,104
26	Central Kakaako	126	-	210,000	-	-	49,227	5,000	95,000	-	119,760	25,231	-	5,908	1,500	8,740	41,379
27	Central Kakaako	-	-	-	-	-	71,475	5,000	36,255	-	56,381	-	-	8,577	1,500	3,336	13,413
28	Central Kakaako	24	-	40,000	-	9,590	62,420	27,010	95,000	-	96,449	4,806	-	8,642	8,103	8,740	30,291
29	Central Kakaako	-	-	-	-	-	-	10,000	90,000	-	32,432	-	-	-	3,000	8,280	11,280
31	Central Kakaako	64	-	106,836	-	-	43,577	10,000	65,756	-	84,286	12,836	-	5,230	3,000	6,050	27,116
32	Central Kakaako	135	-	224,156	-	-	-	10,000	74,202	-	58,741	26,932	-	-	3,000	6,827	36,759
33	Central Kakaako	118	-	195,674	-	-	103,323	10,000	69,471	-	149,405	23,510	-	12,399	3,000	6,392	45,301
34	Central Kakaako	226	-	181,976	-	209,391	42,436	15,664	-	-	112,032	45,200	-	30,220	4,700	-	80,120
35	Central Kakaako	282	-	-	-	15,760	31,680	5,960	-	-	98,186	56,400	-	5,693	1,788	-	63,881
36	Central Kakaako	448	-	745,064	-	-	39,307	13,156	-	-	361,100	89,517	-	4,717	3,947	-	98,181
37	Central Kakaako	223	-	371,548	-	-	8,967	10,136	-	-	116,180	44,640	-	1,077	3,041	-	48,758
38	Central Kakaako	287	-	477,788	-	-	-	30,395	-	-	205,701	57,405	-	-	9,119	-	66,524
39	Central Kakaako	205	-	341,415	-	-	5,202	12,771	-	-	199,198	41,020	-	625	3,832	-	45,477
40	Pauahi	**430**	-	**419,206**	-	-	-	**18,529**	-	-	**229,475**	86,000	-	-	5,559	-	91,559
41	Pauahi	431	-	716,632	-	-	44,877	23,143	-	-	245,500	86,101	-	5,386	6,943	-	98,430
42	Pauahi	603	-	1,003,023	-	-	284,997	62,069	-	-	569,800	120,510	-	34,200	18,621	-	173,331
43	Pauahi	388	-	520,660	-	-	90,054	18,011	-	-	269,640	77,588	-	10,807	5,404	-	93,799
44	Pauahi	407	-	678,300	-	-	59,850	27,385	-	-	323,300	81,495	-	7,182	8,216	-	96,893
46	Pauahi	1,054	-	927,244	-	-	19,000	76,000	-	-	471,580	210,800	-	2,280	22,800	-	235,880
47	Pauahi	-	-	-	-	947	-	-	-	-	-	-	-	114	-	-	114
51	Pauahi	-	-	-	-	-	632,055	237,265	-	-	-	-	-	75,847	71,180	-	147,027
53	Pauahi	802	-	1,334,747	-	-	125,844	29,111	-	-	387,280	160,365	-	15,102	8,734	-	184,201
57	Pauahi	**348**	-	**579,675**	-	-	-	**12,987**	-	-	**159,127**	69,600	-	-	3,897	-	73,497
58	Pauahi	159	-	264,061	-	-	200,005	44,400	-	-	298,740	31,726	-	24,001	13,320	-	69,047
59	Pauahi	149	-	247,483	-	-	146,224	36,556	-	-	173,530	29,734	-	17,547	10,967	-	58,248
60	Pauahi	121	-	201,120	-	-	136,505	27,301	-	-	208,008	24,164	-	16,381	8,191	-	48,736
61	Pauahi	185	-	308,025	-	-	250,655	50,131	-	-	386,364	37,008	-	30,079	15,040	-	82,127
30R	Central Kakaako	458	-	596,548	-	-	-	10,000	-	-	230,965	91,578	-	-	3,000	-	94,578
45 (KS A)	Pauahi	**348**	-	**579,675**	-	-	**1,299**	**9,091**	**2,597**	-	**159,127**	69,600	-	156	2,728	239	72,723
48N (not HH)	Pauahi	370	-	615,798	-	-	56,466	22,800	-	-	180,000	73,986	-	6,776	6,840	-	87,602
52 (KS B)	Pauahi	**114**	-	**188,953**	-	-	**3,389**	**23,722**	**6,778**	-	**74,578**	22,800	-	407	7,117	624	30,948
52X	Pauahi	**591**	-	**591,356**	-	-	-	-	-	-	**199,720**	118,200	-	-	-	-	118,200
54 (KS C)	Pauahi	685	-	1,140,787	-	-	31,238	218,669	62,477	-	421,692	137,062	-	3,749	65,601	5,748	212,160
55 (KS D)	Pauahi	292	-	485,581	-	-	29,730	208,110	59,460	-	253,018	58,341	-	3,568	62,433	5,471	129,813
63E	Auahi	2,163	-		-	-	105,922	15,528	-	-		432,600	-	12,711	4,659	-	449,970
62 (HH 1)																	485,324
63H (HH 3)																	110,827
64 (HH 2)																	199,548
65 (HH 4)																	169,229
6Kap	Kapiolani	38	-		-	-	-	3,616	-	-	-	7,600	-	-	1,085	-	8,685
6TS	Thomas Square	2,435	-	3,741,772	-	-	312,654	242,236	-	-	1,512,092	487,071	-	37,519	72,671	-	597,261
7B+C	Thomas Square	1,143	434	1,901,977	204,000	582,670	8,720	236,574	-	-	798,212	228,516	151,900	70,967	70,973	-	522,356
HH 5																	632,034
Average consumption rates for HHG developments provided by Wilson Okamoto Corporation																	
											TOTALS	**4,586,668** gpd	**151,900** gpd	**704,728** gpd	**723,656** gpd	**81,918** gpd	**7,845,831** gpd

10/30/2014

Table D: Population and Utility Demands - TOD Alternative B

Land Use: TOD Alternative B												Domestic Water Consumption					
Block	HCDA Neighborhood	MF Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	Surface Parking SF	Garage Parking SF	MF Residential	Hotel	Civil / Office	Commercial	General / Light Industry	Average Daily Flow
												200	350	120	300	92	
												gal/unit	ga/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gpd
1	Civic Center	115	-	191,734	-	211,496	-	43,841	6,650	-	248,489	23,036	-	25,380	13,153	612	62,181
2	Civic Center	369	-	507,690	-	124,100	9,136	62,636	-	15,390	242,632	73,770	-	15,989	18,791	-	108,550
3	Civic Center	84	-	139,897	-	62,776	-	-	-	-	-	16,808	-	7,534	-	-	24,342
4	Civic Center	33	-	55,451	-	7,154	101,375	-	-	-	183,233	6,662	-	13,024	-	-	19,686
5	Civic Center	86	-	143,605	-	-	8,281	28,320	-	-	108,000	17,254	-	994	8,496	-	26,744
6		407						86,000				81,400			25,800		107,200
8	Sheridan	84	-	139,482	-	-	39,561	-	-	-	-	16,758	-	4,748	-	-	21,506
9	Sheridan	65	-	108,311	-	-	-	-	-	-	18,940	13,013	-	-	-	-	13,013
10	Sheridan	40	-	64,881	-	73,871	-	-	-	-	-	7,995	-	8,865	-	-	16,860
~~11~~	~~Sheridan~~	~~26~~	-	~~42,600~~	-	-	-	-	-	-	-	~~5,118~~	-	-	-	-	~~5,118~~
12	Sheridan	75	-	124,372	-	-	-	-	-	-	-	14,943	-	-	-	-	14,943
13	Sheridan	147	-	244,849	-	-	-	10,078	-	-	156,317	29,418	-	-	3,024	-	32,442
14	Kapiolani	1,270	-	1,061,528	-	-	**21,000**	10,500	-	-	**622,220**	254,000	-	2,520	3,150	-	259,670
15	Kapiolani	406	-	675,024	-	-	277,798	13,703	-	-	391,728	81,102	-	33,336	4,111	-	118,549
16	Kapiolani	-	-	-	-	41,898	245,254	-	-	-	-	-	-	34,459	-	-	34,459
17	Kapiolani	176	-	166,007	-	-	3,470	38,164	71,720	-	245,892	35,200	-	417	11,450	6,599	53,666
18	Kapiolani	126	-	210,194	-	-	-	52,498	-	-	-	25,254	-	-	15,750	-	41,004
19	Kapiolani	449	-	748,181	-	-	319,088	14,732	-	-	337,200	89,891	-	38,291	4,420	-	132,602
20	Kapiolani	1,088	-	1,197,305	-	-	134,663	64,609	-	-	655,518	217,660	-	16,160	19,383	-	253,203
21	Kapiolani	452	-	751,729	-	-	36,172	20,539	-	-	262,478	90,318	-	4,341	6,162	-	100,821
22	Kapiolani	1,404	-	-	-	-	-	87,604	-	-	358,508	280,800	-	-	26,282	-	307,082
23	Kapiolani	-	-	-	-	-	159,447	50,583	-	-	169,460	-	-	19,134	15,175	-	34,309
24	Central Kakaako	167	-	277,370	-	-	160,570	5,000	55,000	-	253,142	33,325	-	19,269	1,500	5,060	59,154
25	Central Kakaako	15	-	25,000	-	-	20,000	5,000	100,000	-	48,969	3,004	-	2,400	1,500	9,200	16,104
26	Central Kakaako	126	-	210,000	-	-	49,227	5,000	95,000	-	119,760	25,231	-	5,908	1,500	8,740	41,379
27	Central Kakaako	-	-	-	-	-	71,475	5,000	36,255	-	56,381	-	-	8,577	1,500	3,336	13,413
28	Central Kakaako	24	-	40,000	-	9,590	62,420	27,010	95,000	-	96,449	4,806	-	8,642	8,103	8,740	30,291
29	Central Kakaako	-	-	-	-	-	-	10,000	90,000	-	32,432	-	-	-	3,000	8,280	11,280
31	Central Kakaako	64	-	106,836	-	-	43,577	10,000	65,756	-	84,286	12,836	-	5,230	3,000	6,050	27,116
32	Central Kakaako	135	-	224,156	-	-	-	10,000	74,202	-	58,741	26,932	-	-	3,000	6,827	36,759
33	Central Kakaako	118	-	195,674	-	-	103,323	10,000	69,471	-	149,405	23,510	-	12,399	3,000	6,392	45,301
34	Central Kakaako	226	-	181,976	-	209,391	42,436	15,664	-	-	112,032	45,200	-	30,220	4,700	-	80,120
35	Central Kakaako	282	-		-	15,760	31,680	5,960	-	-	98,186	56,400	-	5,693	1,788	-	63,881
36	Central Kakaako	448	-	745,064	-	-	39,307	13,156	-	-	361,100	89,517	-	4,717	3,947	-	98,181
37	Central Kakaako	223	-	371,548	-	-	8,967	10,136	-	-	116,180	44,640	-	1,077	3,041	-	48,758
38	Central Kakaako	287	-	477,788	-	-	-	30,395	-	-	205,701	57,405	-	-	9,119	-	66,524
39	Central Kakaako	205	-	341,415	-	-	5,202	12,771	-	-	199,198	41,020	-	625	3,832	-	45,477
40	Pauahi	**430**	**-**	**419,206**	**-**	**-**	**-**	**18,529**	**-**	**-**	**229,475**	86,000	-	-	5,559	-	91,559
41	Pauahi	**386**	**-**	**641,771**	**-**	**-**	**37,757**	**13,211**	**-**	**-**	**174,666**	77,200	-	4,531	3,964	-	85,695
42	Pauahi	**458**	**-**	**761,961**	**-**	**-**	**105,520**	**45,181**	**-**	**-**	**497,000**	91,600	-	12,663	13,555	-	117,818
43	Pauahi	388	-	520,660	-	-	**75,261**	**18,815**	-	-	269,640	77,588	-	9,032	5,645	-	92,265
44	Pauahi	**363**	**-**	**604,800**	**-**	**-**	**59,850**	**27,385**	-	-	**294,260**	72,600	-	7,182	8,216	-	87,998
46	Pauahi	**721**	**-**	**742,200**	**-**	**-**	**21,600**	**28,800**	**-**	**-**	**327,547**	144,200	-	2,592	8,640	-	155,432
47	Pauahi	-	-	-	-	947	-	-	-	-	-	-	-	114	-	-	114
51	Pauahi	-	-	-	-	-	632,055	237,265	-	-	-	-	-	75,847	71,180	-	147,027
53	Pauahi	**695**	**-**	**1,157,732**	**-**	**-**	**125,844**	**29,111**	**-**	**-**	**361,074**	139,000	-	15,102	8,734	-	162,836
57	Pauahi	**348**	**-**	**579,675**	**-**	**-**	**-**	**12,987**	**-**	**-**	**159,127**	69,600	-	-	3,897	-	73,497
58	Pauahi	159	-	264,061	-	-	200,005	44,400	-	-	298,740	31,726	-	24,001	13,320	-	69,047
59	Pauahi	149	-	247,483	-	-	146,224	36,556	-	-	173,530	29,734	-	17,547	10,967	-	58,248
60	Pauahi	121	-	201,120	-	-	136,505	27,301	-	-	208,008	24,164	-	16,381	8,191	-	48,736
61	Pauahi	185	-	308,025	-	-	250,655	50,131	-	-	386,364	37,008	-	30,079	15,040	-	82,127
30R	Central Kakaako	458	-	596,548	-	-	-	10,000	-	-	230,965	91,578	-	-	3,000	-	94,578
45 (KS A)	Pauahi	**392**	**-**	**652,718**	**-**	**-**	**9,620**	**67,340**	**19,240**	**-**	**241,646**	78,400	-	1,155	20,202	1,771	101,528
48N (not HH)	Pauahi	**323**	**-**	**536,898**	-	-	56,466	22,800	-	-	180,000	64,600	-	6,776	6,840	-	78,216
52 (KS B)	Pauahi	**84**	**-**	**140,312**	**-**	**-**	**5,580**	**39,060**	**11,160**	**-**	**78,840**	16,800	-	670	11,718	1,027	30,215
52X	Pauahi	**591**	**-**	**591,356**	**-**	**-**	**-**	**-**	**-**	**-**	**199,720**	118,200	-	-	-	-	118,200
54 (KS C)	Pauahi	**630**	**-**	**1,049,076**	**-**	**-**	**29,730**	**208,110**	**59,460**	**-**	**263,287**	126,000	-	3,568	62,433	5,471	197,472
55 (KS D)	Pauahi	**342**	**-**	**569,815**	**-**	**-**	**29,730**	**208,110**	**59,460**	**-**	**263,287**	68,400	-	3,568	62,433	5,471	139,872
63E	Auahi	2,163	-		-	-	105,922	15,528	-	-		432,600	-	12,711	4,659	-	449,970
62 (HH 1)																	485,324
63H (HH 3)																	110,827
64 (HH 2)																	199,548
65 (HH 4)																	169,229
6Kap	Kapiolani	38	-		-	-	-	3,616	-	-	-	7,600	-	-	1,085	-	8,685
6TS	Thomas Square	**2,353**	-	3,741,772	-	-	312,654	242,236	-	-	1,512,092	470,600	-	37,519	72,671	-	580,790
7B+C	Thomas Square	**816**	**356**	**1,358,972**	**204,000**	**582,670**	**15,067**	**117,362**	**-**	**-**	**686,000**	163,200	124,600	71,729	35,209	-	394,738
HH 5																	632,034
Average consumption rates for HHG developments provided by Wilson Okamoto Corporation																	
											TOTALS	**4,362,621**	**124,600**	**682,716**	**684,835**	**83,576**	**7,535,309**
												gpd	gpd	gpd	gpd	gpd	gpd

Appendix K:
Kaka`ako Sewer Master Plan Update

SEWER MASTER PLAN UPDATE

HCDA KAKA'AKO MAUKA DISTRICT

Kaka'ako, O'ahu, Hawai'i

December 2014

Prepared for:
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2012.70.0900

1 PURPOSE

The purpose of this study is to provide an updated sewer master plan for the Hawai'i Community Development Authority (HCDA) Kaka'ako Community Development District (KCDD) – Mauka Area. The analysis reflects development projects currently or soon to be under construction, developments and infrastructure upgrades proposed by the Howard Hughes Group (HHG) for their properties within the district, and the increased densities proposed in the Transit Oriented Development (TOD) overlay for the KCDD Mauka area. The infrastructure requirements associated with the current developments and infrastructure improvements were not available at the time the previous utility analyses presented in the *Mauka Area Infrastructure Plan*[1] prepared in conjunction with the *KCDD Final Supplemental Environmental Impact Statement – Mauka Area Plan*[2] was prepared.

Recommendations for system improvements are made to upgrade the infrastructure system to meet the demands of the projected development scenarios. The master plan will be used by the City and County of Honolulu (City) as a guide for evaluating infrastructure needs for future developments in the KCDD Mauka Area.

2 BACKGROUND

HCDA is considering rule changes for the KCDD to incorporate transit oriented development. Rule changes would permit greater development densities than currently allowed under the Mauka Area rules. The sewer master plan maintained by City does not reflect the on-going developments or proposed densities as allowed in the Mauka Area rules. The City master plan for the KCDD Mauka Area was last updated in 2009. This study will model the existing sewer infrastructure systems and comment on whether the existing systems can sustain an increase in development density.

The study area is approximately 503 acres, bound by South King Street, Pi'ikoi Street, Ala Moana Boulevard, and Punchbowl Street. The analysis considers four scenarios: the existing condition, a Future Baseline Condition, the Proposed TOD Alternative A, and the 690 Pohukaina Street Project. Where appropriate, projects currently approved for development are incorporated into each scenario.

- The existing condition is defined as the current land uses for each tax map key parcel and include redevelopment projects that have an approved sewer connection application or that are currently under construction. Uses and densities were derived from real property records of the individual tax map parcels within the study area.
- The Future Baseline Condition represents full build out in accordance with the current Mauka Area rules. Redevelopment is evaluated by large city blocks, combining several

[1] M&E Pacific, *Kakaako Community Development District, Mauka Area Infrastructure Plan* (Honolulu: March 2009).
[2] EDAW, Inc., *Kakaako Community Development District, Final Supplemental Environmental Impact Statement, Mauka Area Plan* (Honolulu, May 2009).

adjacent TMK parcels generally bound by the existing street grid. A capacity study[3] detailing the number of residential units and floor areas for non-domestic uses was prepared, presenting a plausible development plan in conformance with the current Mauka Area rules.

- The TOD Alternative A represents the full build out of the KCDD utilizing an increase in densities over and above what is currently allowed in the Mauka Area rules. A redevelopment plan was prepared using the same methodology as the Future Baseline Condition with the proposed TOD Alternative A densities.
- The TOD Alternative B proposes densities similar to the TOD Alternative A, however, with a 400-ft building height cap imposed. The resulting densities for Alternative B are approximately 10% less than Alternative A. Given the marginal difference in densities, the master plan analysis considers only the greater densities proposed under TOD Alternative A.
- The 690 Pohukaina Street Project is a high-rise condominium project that is incorporated into TOD Alternatives A and B. The project is evaluated as being constructed prior to full build out of the TOD Alternatives. The existing condition model was modified to incorporate the project.

For the purposes of the infrastructure master plan update, infrastructure demands for specific blocks in the Future Baseline and TOD Alternative A scenarios were adjusted to reflect properties that are not likely to be redeveloped. For example, high-rise condominiums, government agency facilities, open space areas such as parks and cemeteries, and projects near or under construction are assumed to remain under both scenarios. See Figure 1 in the appendix.

3 ANALYSIS

This sewer master plan update is generally prepared in accordance with Chapter 20 of the Design Standards of the Wastewater Department (Design Standards), Volume 1, July 1993. The hydraulic analysis was performed using the EPA Storm Water Management Model (SWMM) version 5 as implemented in the Autodesk Storm and Sanitary Analysis 2014 application.

3.1 POPULATION

The land use categories and corresponding capita rate are utilized for the existing condition:

Table 1: Population Rates

Use	Unit Capita	Unit	Average daily flow rate (gpcd)
SF Residential	4 residents	Dwelling	80
MF Residential	2.8 residents	Dwelling	80
Civic / Office	300 employees	Acre	25
Retail	140 employees	Acre	25
General/Light Industry	100 employees	Acre	25
Parking Structure	1 employee	Each	25
School	1 student	Per 80 sf	25
Restaurant	1 cover	Per 25 sf	5 gal/cover @ 6 services per day
Cinema	Metered water consumption rates used in lieu of population estimates based on patronage.		

See Tables 2, 3, and 4 in the appendix.

3.2 FLOW DETERMINATION

The determination of total wastewater flow generally conforms to the Design Standards. The design wastewater flows and dry weather infiltration/inflow are determined in accordance with the Design Standards. All sewers are assumed to be below the ground water table. A single flow factor is determined for each scenario, based on the total equivalent population for that scenario. Wet weather inflow and infiltration (WWI/I) is not computed in accordance with the Design Standards, rather, is based on the 5 year 24 hour values provided by the City[4]. The design and WWI/I flow values are assigned to the corresponding manholes. See Figures 1B, 1C, Table 5, and Table 6 in the appendix.

The off-site sewage flow rates are adjusted to reflect population growth for the Future Baseline and TOD Alternative A scenarios. Off-site sewer service basins which drain to the KCDD system were determined for each boundary SMH where offsite flows are applied in the model. The model assumes the net change in off-site sewer generation is equivalent to the average population growth within the off-site sewer basin.

Population growth rates are derived from projections for Development Plan Areas and subareas developed by the City and County of Honolulu.[5] Growth rates are computed by comparing 2010 and 2035 projections for each area. Local rates of change vary from a decrease of 1.5% in Waiʻalae-Kahala to an increase of 94.1% over 2010 in the Ala Moana-Kakaʻako area.

[3] Note the capacity study only suggests a possible development scenario. The HCDA Rules allow for a great degree of flexibility in development. Blocks may be developed as a single project, or as multiple smaller parcels and proposed uses may vary widely.

[4] Updated City sewer models indicate the 5 year 24hr inflow and infiltration values are much higher than the what is computed using the Design Standards.

[5] Department of Planning and Permitting projections posted at http://www.honoluludpp.org/Portals/0/pdfs/planning/demographics2/Projections/2000-2035byDPSA.pdf. The projections were made in 2009, and based on the State's 2035 Series of State and County population projections. More recent projections are available for the State and County, but not for subareas.

Table 7: Offsite Sewer Flows

Boundary SMH	Existing Design Maximum Flow (mgd)	Average Year 2035 Population Growth Factor	Future / TOD Alternative A Design Maximum Flow (mgd)	Wet Weather I/I 5 yr 24 hr (mgd)
339739	0.0115	139%	0.0161	0.0271
340340	0.0018	139%	0.0025	0.0076
340475	0.5609	139%	0.6170	0.9523
340496	0.3596	139%	0.5013	0.3220
340787	0.0457	107%	0.0491	0.1386
341080 S60" Ward Avenue	**14.5126**	**103%**	**14.9983**	**65.3885**
341082	0.0275	103%	0.0295	0.0808
341270	0.0710	107%	0.0760	0.1242
341283	0.0370	107%	0.0398	0.0922
351590	0.0082	107%	0.0088	0.0144
351869	0.5657	107%	0.6078	0.6399
352912	4.1797	127%	5.3062	5.3216
379476	0.0045	194%	0.0087	0.0782
380402	22.0012	102%	22.4288	0.0000
380962	0.0033	194%	0.0064	0.0152
381780	0.0211	194%	0.0410	0.0476
683754	2.1605	139%	3.0121	0.0428
4025665	3.1025	125%	3.8761	0.1851
4076088 36" Kapi'olani Boulevard	**5.7604**	**127%**	**7.3130**	**0.0000**
Total Off-site Flow	53.4347		58.9385	73.4781

Wet weather I/I values as derived from City dataset.

3.3 HYDRAULIC ANALYSIS

The sewer infrastructure system hydraulic network modeling is performed using hydrodynamic routing methods. A static hydraulic model is inappropriate for this analysis as several sections of the existing sewers in Kaka'ako are at adverse slopes[6]. Per discussions with the City and County of Honolulu Department of Design and Construction (DDC), the following modeling parameters area utilized to maintain consistency with the DDC's models:

- Mannings n = 0.013 for all reaches
- No entrance or exit losses are applied to manhole junctions

[6] Sewer mains with adverse slopes slope uphill. This condition generally occurs where sags in the sewer mains have developed. The computations used to compute pipe flow in a static model would yield erroneous results when applied to adversely sloped sections.

The sewer network is based on GIS data obtained from the City. Apparent discrepancies in the GIS data were confirmed or corrected in consultation with the City. Modifications to the sewer networks for the Future Baseline and TOD Alternative A were made to incorporate the proposed improvements planned by the HHG within the study area. HHG is proposing to:

- Install a 24" relief sewer in Ward Avenue between Ilaniwai and Auahi Streets
- Reroute the 48" trunk sewer from under the Ross Dress for Less and Sports Authority stores into Ward Avenue
- Replace the 6" sewers in Pohukaina Street between Koula and Ward Avenue with 12" sewers
- Install a 36" sewer in Auahi Street between Kamakee Street and Ward Avenue
- Replace the 8" sewer in Auahi Street between Kamakee Street and Queen Lane with a 12" sewer.

See Figure 2 in the appendix.

3.4 OFF-SITE RELIEF SEWER PROJECTS

The City is studying several relief sewer projects outside the KCDD that will provide increased sewer capacity to the Mauka Area. The details of these relief sewer projects, including time schedules, are currently being evaluated internally at the City and have not been released to the public at this time. The City has indicated the relief sewer projects will be designed to accommodate TOD developments outside of the KCDD once the impact of those developments are determined. While this study does not identify specific relief sewer projects, it does suggest minimum flow reductions needed to alleviate any surcharged conditions in the study area.

3.5 RESULTS

Existing Condition

The peak flow model indicates surcharged sewers:

- The 30" and 60"trunk sewers in Auahi Street and Ward Avenue respectively, on the west side of the KCDD
- A portion of the 21" trunk sewer in Kapi'olani Boulevard near Pensacola Street
- 8" and 24" branch sewers connecting to the 72"Auahi Street between Keawe Street and Cooke Street
- 8" sewer immediately downstream of the Halekauwila Place sewer connection on Keawe Street

New developments with increased sewer demands within the KCDD may not be able to connect to the adjacent sewers because the City does not allow a sewer connection to a line that is surcharged or to a line which discharges to a surcharged line. See Figure 3 in the appendix.

Future Baseline

The surcharged condition under the existing condition is compounded under the Future Baseline scenario west of Ward Avenue. The proposed HHG sewer system improvements will provide sufficient capacity for the HHG developments east of Ward Avenue. The following sewers remain surcharged:

- The 30", 36", 60", and 78" trunk sewers in South Street, Auahi Street, and Ward Avenue on the west side of the KCDD
- The 8", 10", and 12" Halekauwila Street sewers between South Street and just west of Coral Street
- The 10" Pohukaina Street sewer between South Street and Keawe Street
- The 8" sewer immediately downstream of the Halekauwila Place sewer connection on Keawe Street
- The 36" sewer around the former CompUSA building on South and Auahi Streets and Ala Moana Boulevard
- The planned HHG 12" sewer on Pohukaina Street between Koula Street and Ward Avenue and branching 6" sewers on 'Ohe and Koula Streets
- Portions of the 21" trunk sewer in Kapiʻolani Boulevard near Pensacola Street
- The 12" and 18" branching sewers on Kawaihao and Queen Streets, connecting to the 36" sewer in Kamakeʻe Street

See Figure 4 in the appendix.

TOD Alternative A

The surcharged condition under the Future Baseline scenario is compounded under the TOD Alternative A scenario. In addition to the sewers surcharged under the Future Baseline condition, the following sewers are surcharged:

- The 8", 10", and 12" Halekauwila Street sewers from South Street to east of Cooke Street
- The 8" and 10" Pohukaina Street sewers from South Street to Coral Street
- The 6" Ilaniwai Street sewer between Cooke Street and Ward Avenue

See Figure 5 in the appendix.

690 Pohukaina Street Project

The existing sewers adjacent to the 690 Pohukaina Street project have insufficient capacity for the projected wastewater flows and the downstream sewers in South Street and Auahi Street are surcharged. Furthermore, the model indicates the 8" sewer in Keawe Street does not have sufficient capacity for the Halekauwila Place sewage flow.

See Figure 6 in the appendix.

3.6 MITIGATION MEASURES

Future Baseline

- Replace 480 lf of 10" sewer on Pohukaina Street between South and Keawe Streets, SMH 4025647 to SMH 683930, with a 12" sewer.
- Replace 310 lf of 8" sewer on Keawe Street makai of Halekauwila Street, SMH 683930 to SMH 341527, with a 12" sewer.
- Upsize 305 lf of HHG's planned sewer in Pohukaina Street between Ahui Street and Ward Avenue from 12" to 18" diameter, between SMH 379756 and the new 24" sewer in Ward Avenue. Sewer demands from Blocks 48N and 55 (KS D) are redirected to this line as the adjacent 6" and 8" sewers are inadequate.
- City's proposed diversion of sewage flow from the 60" Ward Avenue trunk sewer; a minimum of 27 MGD was used in the analysis.

See Figure 7 in the appendix.

TOD Alternative A

- Replace 480 lf of 10" sewer on Halekauwila Street between South and Keawe Streets, SMH 4025647 to SMH 683930, with a 12" sewer.
- Replace 310 lf of 8" sewer on Keawe Street makai of Halekauwila Street, SMH 683930 to SMH 341527, with a 12" sewer.
- Replace 250 lf of 6" sewer on Ilaniwai between Kamani Street and Ward Avenue, SMH 342208 to SMH 342321, with an 8" sewer.
- Upsize 305 lf of HHG's planned sewer in Pohukaina Street between Ahui Street and Ward Avenue from 12" to 18" diameter, between SMH 379756 and the new 24" sewer in Ward Avenue. Sewer demands from Blocks 48N and 55 (KS D) are redirected to this line as the adjacent 6" and 8" sewers are inadequate.

See Figure 8 in the appendix.

Off-site Diversion

Approximately 132 MGD of sewage flow originates outside the KCDD and passes through the study area. A diversion of a minimum of 27 MGD of sewage flow from the 60" Ward Avenue

trunk sewer will alleviate surcharged conditions in Ward Avenue, Auahi Street, and South Street under the Future Baseline and TOD Alternative A scenarios.

Surcharged Sewers to Remain

With the proposed diversion and sewer system improvements in place, a number of existing branching sewer mains will remain surcharged. Under ideal conditions the top of a branching sewer is typically set at an elevation equal to the top of the trunk sewer to minimize surcharging of the branching sewer. The following branching sewers all connect to a trunk sewer with the branching sewer inverts set at or near the trunk sewer invert. The branch sewer profiles suggest external factors such as a conflicting utility precluded a higher invert connection or larger pipe diameter. In these instances, surcharging of the branching sewers is practically unavoidable.

- The 8" sewer, ID 4065997, at the intersection of Auahi and Coral Streets
- The 24" sewer, ID 3014925, at the intersection of Cooke and Auahi Streets
- The 30" sewer, IDs 685449, 685488, and 3010720, on Auahi Street between South and Keawe Streets
- The 10" sewer, ID 4026585, at the intersection of Halekauwila and Cooke Streets
- The 6" sewer, ID 344232, at the intersection of Archer Lane and South Beretania Street
- The triple barrel 12" sewers, ID 3015527, at the intersection of Kapiʻolani Boulevard and Pensacola Street
- The 21" sewer, ID 380522, on Kapiʻolani Boulevard, just west of Pensacola Street
- The 8" sewer, ID 4047070, 12" sewer, ID 4046376, and 18" sewer, ID 2023300 connecting to the 36" Kamakeʻe Street sewer.

See Figure 8 in the appendix.

690 Pohukaina Street Project Sewer Connection

The 690 Pohukaina Street Project is located in the area impacted by the surcharged sewer lines in South and Auahi Streets. In accordance with the Design Standards, a sewer connection to a surcharged line is typically not allowed. The project would not be able to connect to the sewers fronting the property. The following off-site improvement would provide sewer service to the project:

- Replace 480 lf of 10" sewer on Pohukaina Street between South and Keawe Streets, SMH 4025647 to SMH 683930, with a 12" sewer.

See Figure 9 in the appendix.

4 OPINIONS OF PROBABLE COSTS

Opinions of probable costs are estimated for the proposed mitigation measures. A lineal foot unit cost for sewer line installation is derived from recent similar sewer line construction projects. The total cost includes design fees equal to 10% of the probable construction cost and a 25% contingency. The opinions of probable costs are summarized in Table 8 below.

Table 8: Opinion of Probable Construction Costs

Mitigation Measure	Unit Cost	Future Baseline	TOD Alternative A
Replace 480 lf of 10" sewer on Pohukaina Street between South and Keawe Streets, SMH 4025647 to SMH 683930, with a 12" sewer.	$4,125 / lf	$1,980,000	$1,980,000
Upsize 305 lf of HHG's planned sewer in Pohukaina Street between Ahui Street and Ward Avenue from 12" to 18" diameter, between SMH 379756 and the new 24" sewer in Ward Avenue. [1]	$210 / lf	$64,000	$64,000
Replace 310 lf of 8" sewer on Keawe Street makai of Halekauwila Street, SMH 683930 to SMH 341527, with a 12" sewer.	$4,125 / lf	$1,280,000	$1,280,000
Replace 250 lf of 6" sewer on Ilaniwai between Kamani Street and Ward Avenue, SMH 342208 to SMH 342321, with an 8" sewer.	$4,125 / lf	n/a	$1,100,000
Total Opinion of Probable Cost (rounded)		$3,400,000	$4,500,000

1. Fair share cost to upsize the HHG base design.

5 CONCLUSION

The KCDD Mauka Area sewer system is impaired by the larger off-site sewer flows that surcharge the trunk sewers in the district. Sewer system improvements proposed by HHG and herein in addition to an off-site sewer diversion proposed by the City will free sewer capacity within the KCDD.

On-site sewer improvements include:

HHG Proposed Improvements

- Install a 24" relief sewer in Ward Avenue between Ilaniwai and Auahi Streets
- Reroute the 48" trunk sewer from under the Ross Dress for Less and Sports Authority stores into Ward Avenue
- Replace the 6" sewers in Pohukaina Street between Koula and Ward Avenue with 12" sewers
- Install a 36" sewer in Auahi Street between Kamakee Street and Ward Avenue
- Replace the 8" sewer in Auahi Street between Kamakee Street and Queen Lane with a 12" sewer.

Future Baseline

- Replace 480 lf of 10" sewer on Halekauwila Street between South and Keawe Streets with a 12" sewer.
- Replace 310 lf of 8" sewer on Keawe Street makai of Halekauwila Street with a 12" sewer.
- Upsize 305 lf of HHG's planned sewer in Pohukaina Street between Ahui Street and Ward Avenue from 12" to 18" diameter.

TOD Alternative A

- Replace 480 lf of 10" sewer on Halekauwila Street between South and Keawe Streets with a 12" sewer.
- Replace 310 lf of 8" sewer on Keawe Street makai of Halekauwila Street with a 12" sewer.
- Replace 250 lf of 6" sewers on Ilaniwai between Cooke Street and Ward Avenue with 8" sewers.
- Upsize 305 lf of HHG's planned sewer in Pohukaina Street between Ahui Street and Ward Avenue from 12" to 18" diameter.

APPENDICES

Figures

- Figure 1 – Mauka Area Projects
- Figure 1b – Flow Generation
- Figure 1c – Discharge SMH
- Figure 2 – Howard Hughes Group Development and Proposed Sewer Improvements
- Figure 3 – Existing Condition Peak Flow
- Figure 4 – Future Condition Peak Flow
- Figure 5 – TOD Alternative A Peak Flow
- Figure 6 – 690 Pohukaina Street Project Impact
- Figure 7 - Future Condition with Diversions Peak Flow
- Figure 8 – TOD Alternative A with Diversions Peak Flow
- Figure 9 – 690 Pohukaina Street Project Sewer Connection

Tables

- Table 2 – Population and Utility Demands – Existing Condition
- Table 3 – Population and Utility Demands – Future Baseline
- Table 4 – Population and Utility Demands – TOD Alternative A
- Table 5 – Flow Computation – Existing Condition
- Table 6 – Flow Computation – Future Baseline and TOD Alternative A

Model Inputs and Results

- Discharge Manhole Summary
- Existing Condition
- Future Baseline
- TOD Alternative A
- Future Baseline w/Diversion and Improvements
- TOD Alternative A w/Diversion and Improvements
- 690 Pohukaina w/Improvements

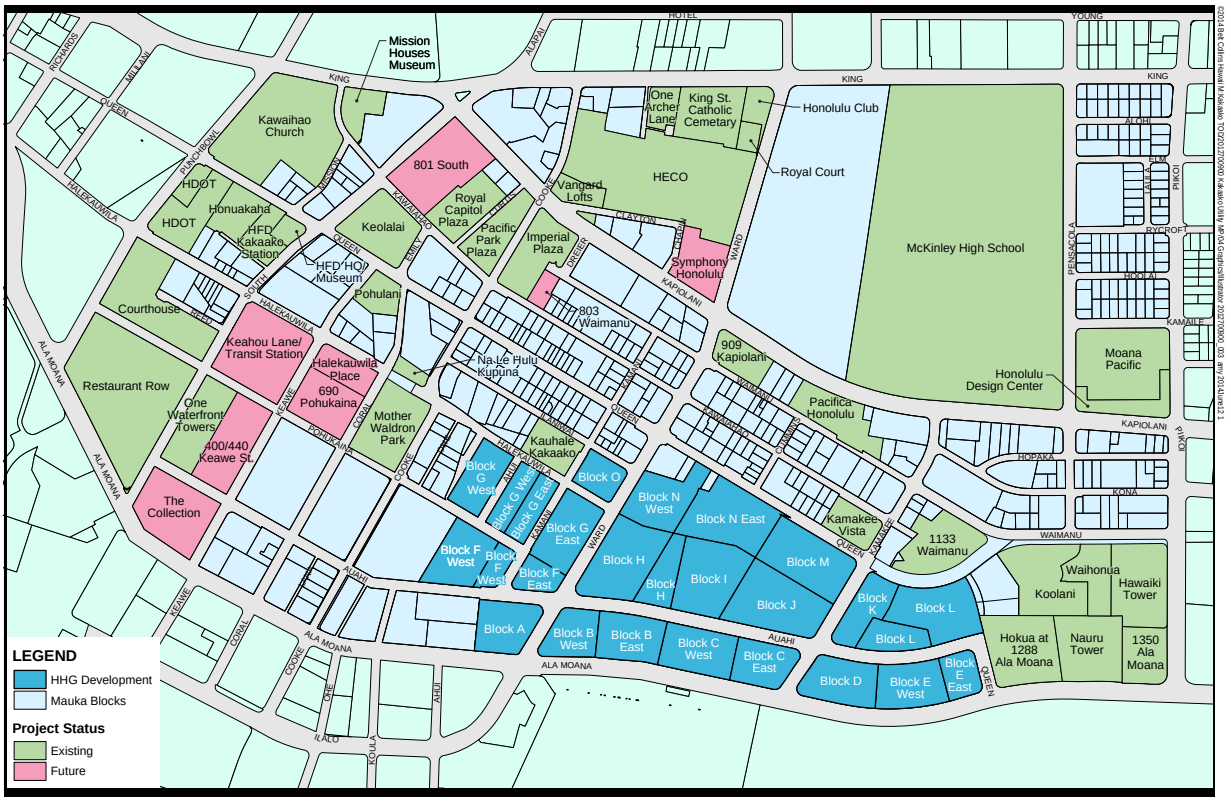
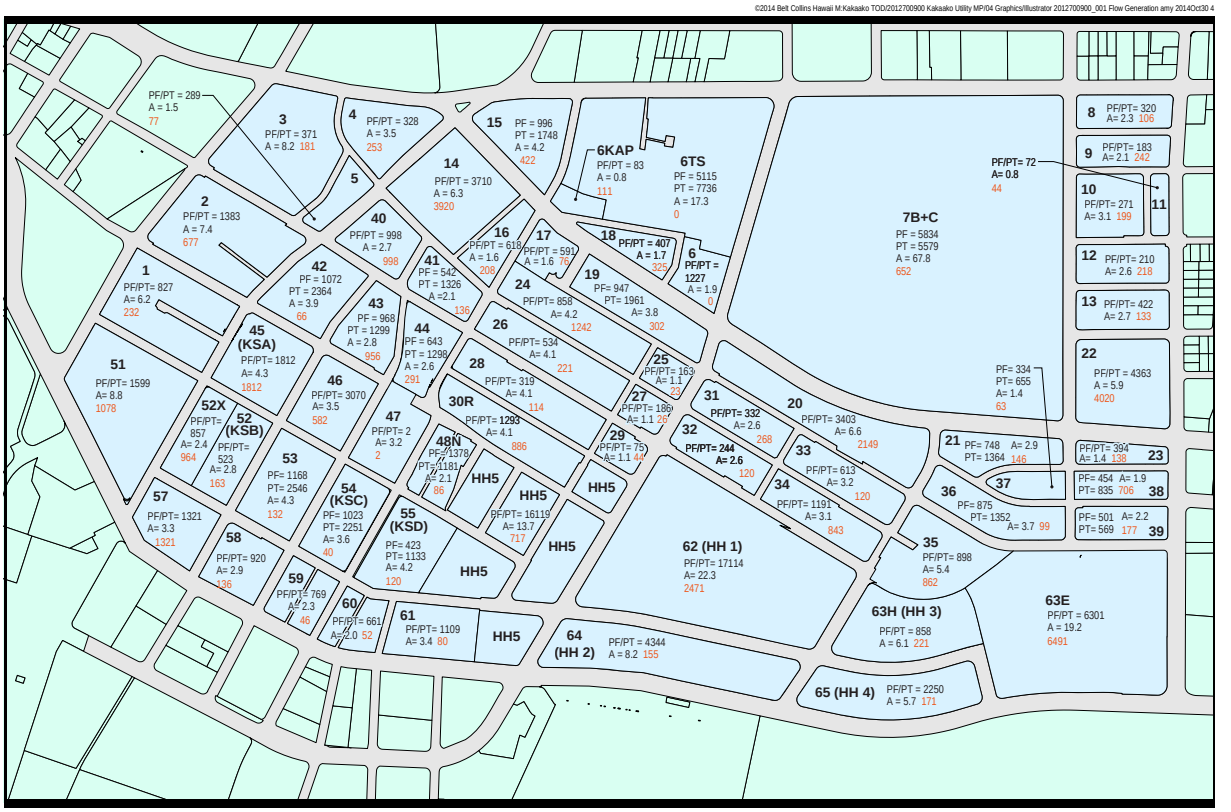


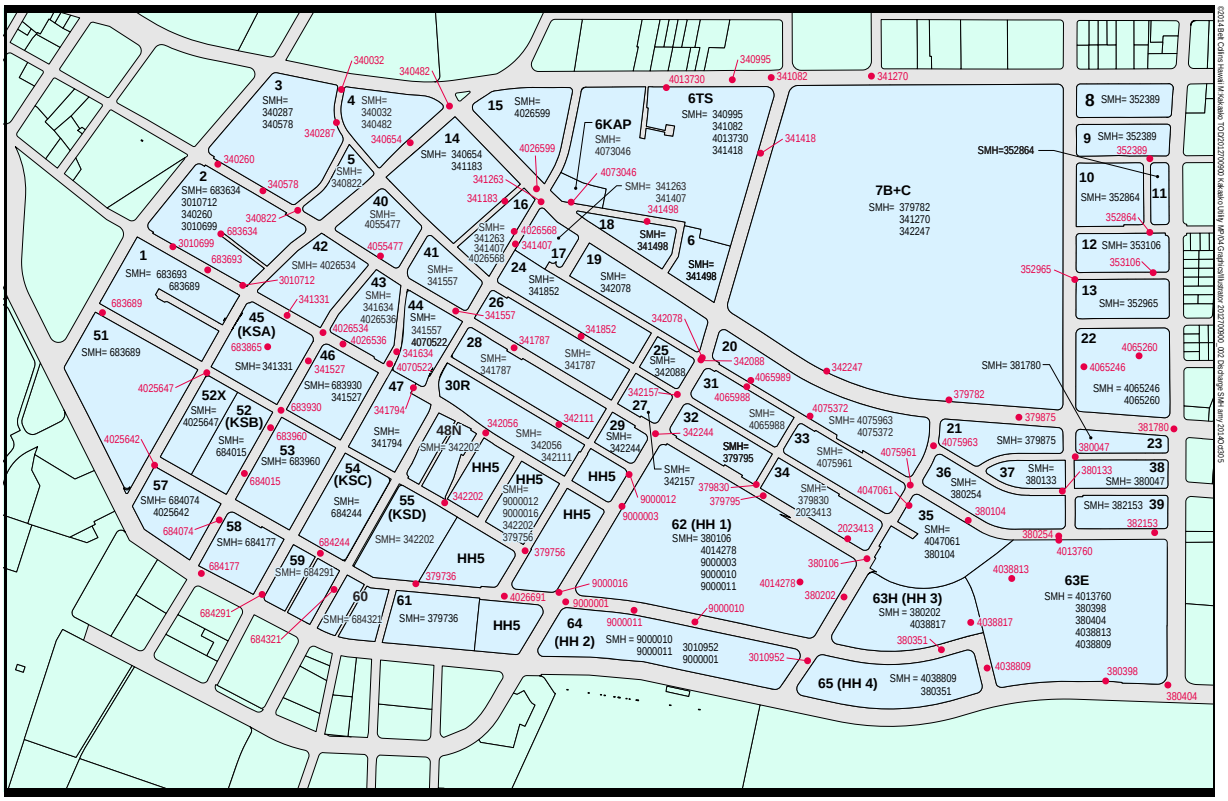
Figure 1
Mauka Area Projects
Kakaako Mauka Sewer Master Plan
HCDA
6/12/2014



LEGEND

100	Existing equivalent population, capita
PF	Future base equivalent population, capita
PT	TOD equivalent population, capita
A	Block area, acre
SMH	Discharge point

Figure 1B
Flow Generation
Kakaako Mauka Sewer Master Plan
HCDA
6/13/2014



LEGEND

SMH Discharge point

Sewer Manhole

379736 Sewer Manhole ID Number

0 175 350 700

SCALE IN FEET

Figure 1C
Discharge SMH

Kakaako Mauka Sewer Master Plan
HCDA
6/11/2014

0 87.5 175 350

SCALE IN FEET

Figure 2
Howard Hughes Group Development
and Proposed Sewer Improvements

Kakaako Mauka Sewer Master Plan
HCDA
10/30/2014

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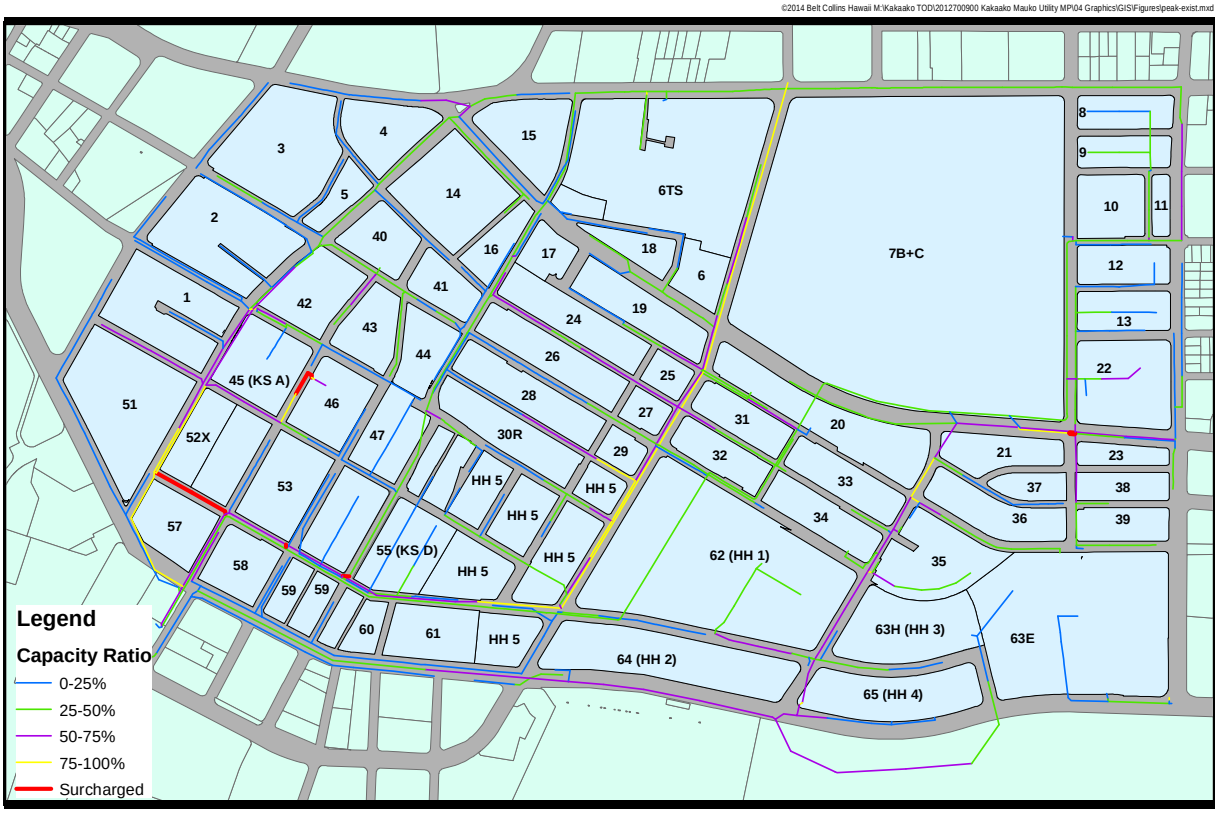

Figure 3
Existing Condition Peak Flow
Kakaako Mauka Sewer Master Plan
HCDA
6/17/2014

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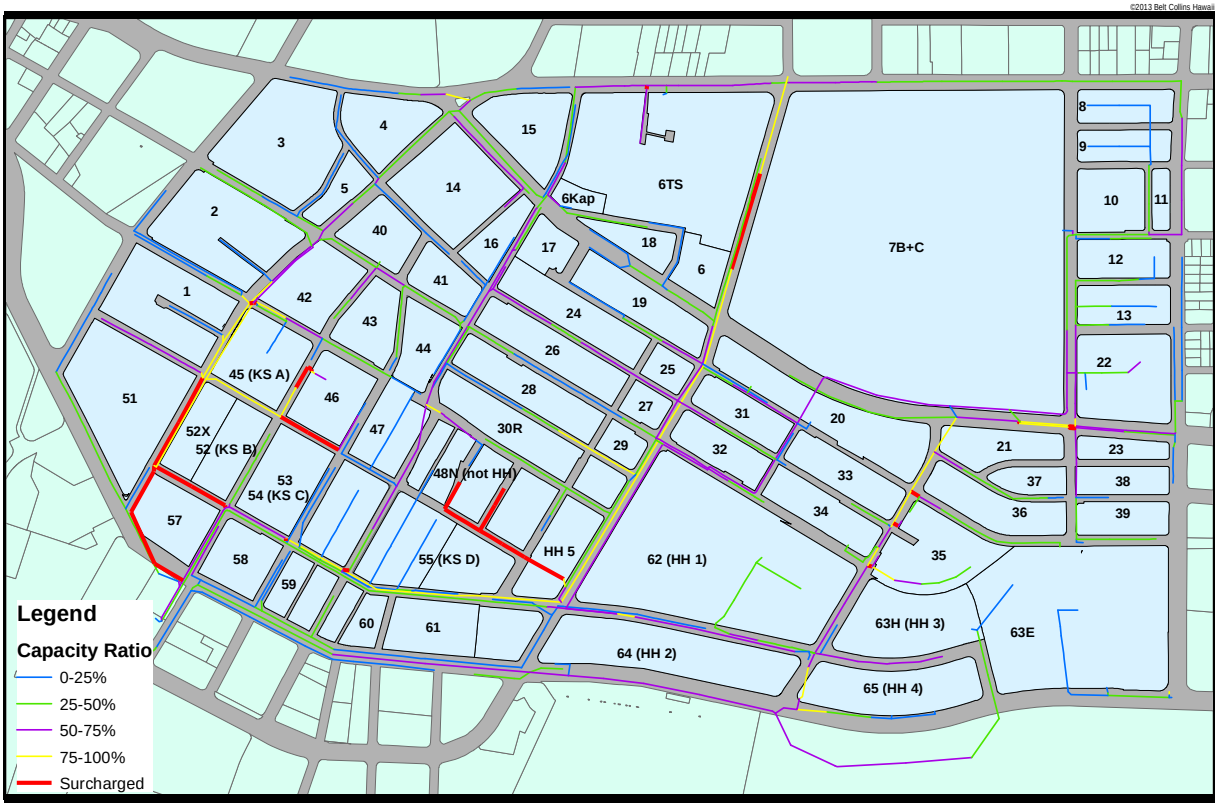

Figure 4
Future Condition Peak Flow
Kakaako Mauka Sewer Master Plan
HCDA
10/30/2014

Figure 6
690 Pohukaina Street Project Impact
Kakaako Mauak Sewer Master Plan
HCDA
10/30/2014

Figure 5
TOD Overlay Peak Flow
Kakaako Mauka Sewer Master Plan
HCDA
10/30/2014

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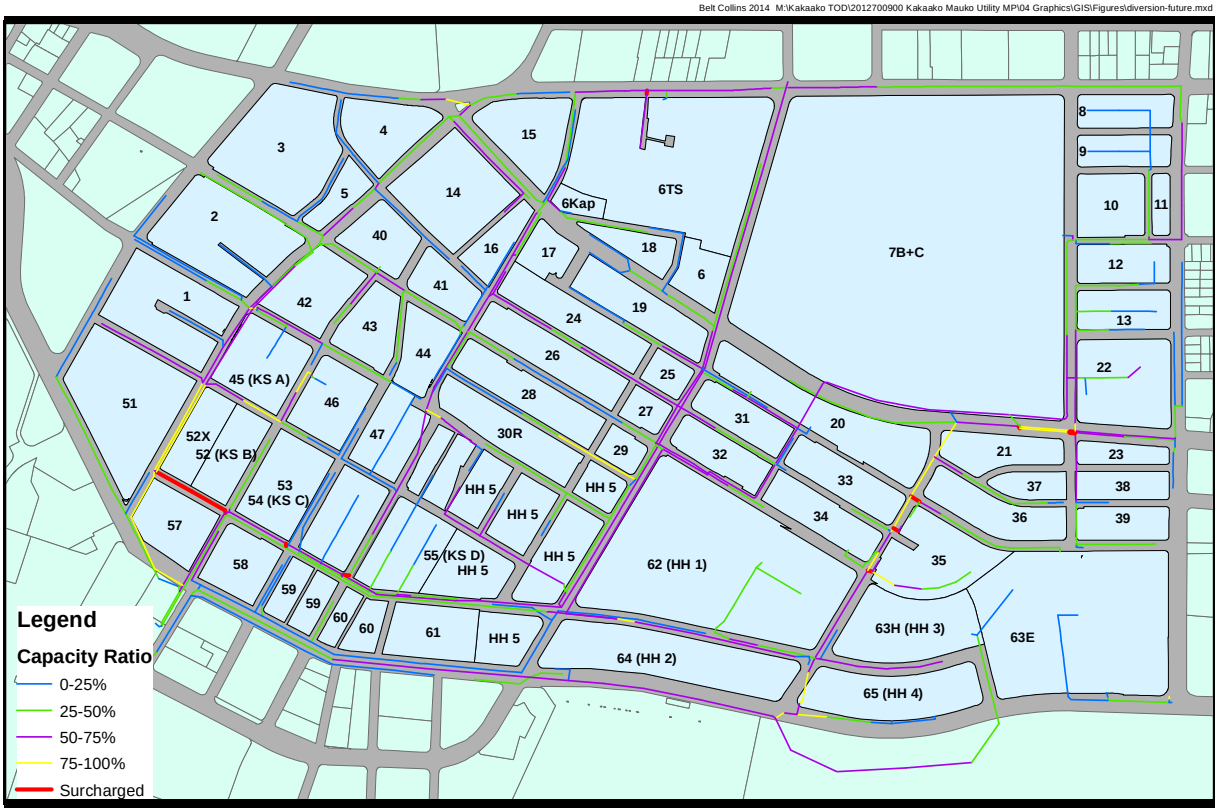

Figure 7
Future Condition with Diversions Peak Flow
Kakaako Mauka Sewer Master Plan
HCDA
6/17/2014

0 175 350 700
SCALE IN FEET

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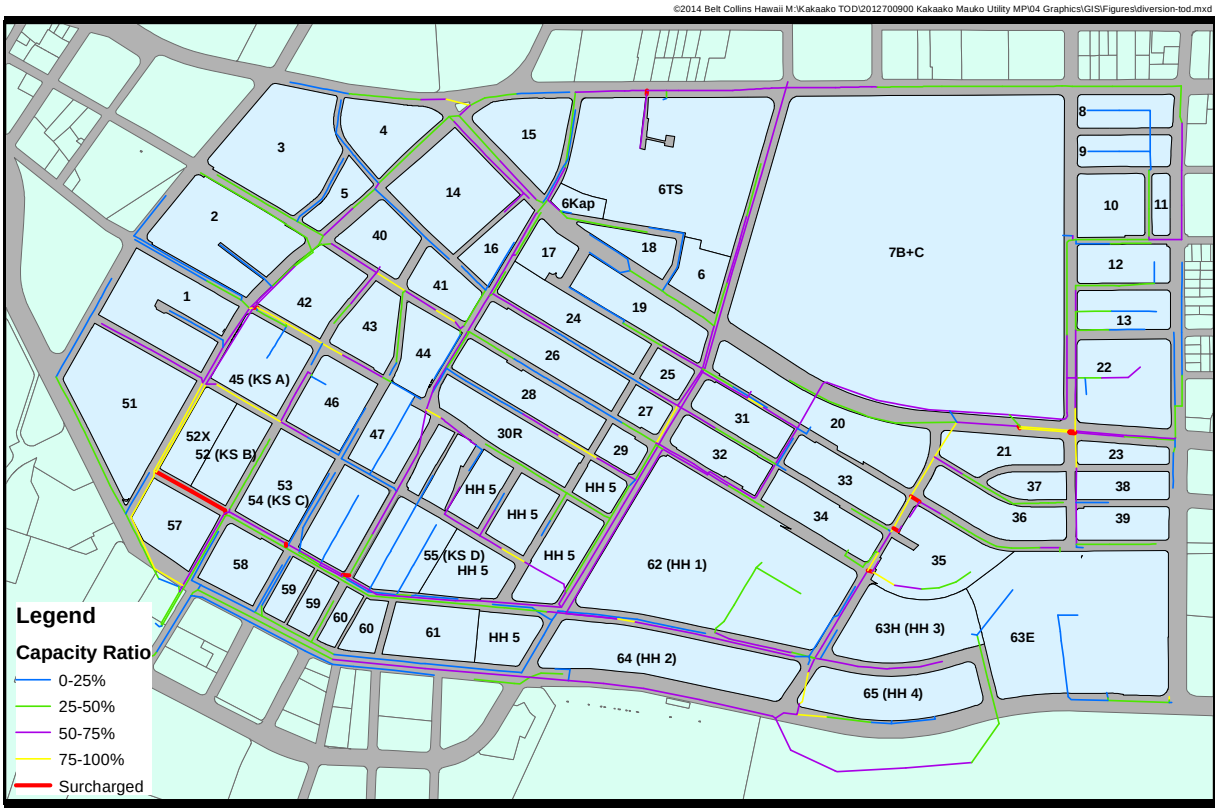

Figure 8
TOD Alternative A **with Diversions Peak Flow**
Kakaako Mauka Sewer Master Plan
HCDA
6/17/2014

0 175 350 700
SCALE IN FEET

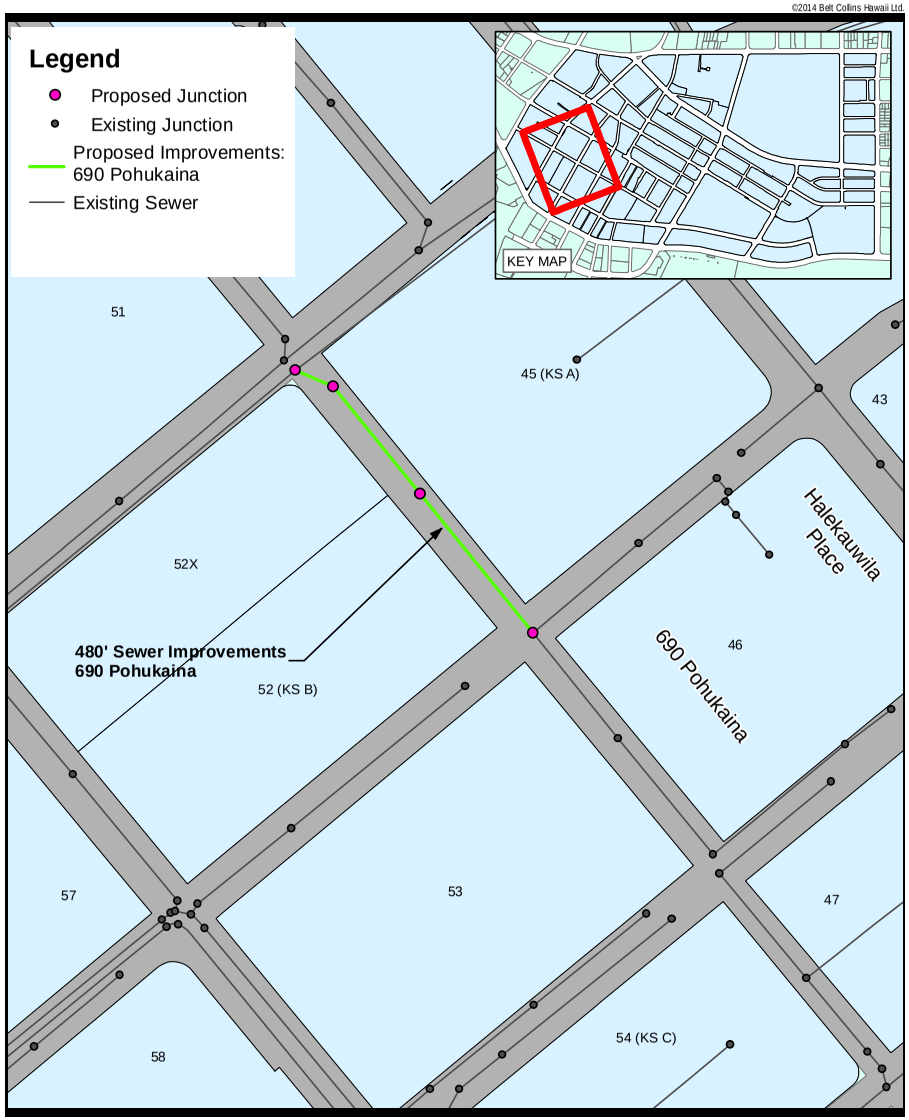

Figure 9

690 Pohukaina Street Project Sewer Improvements

Kakaako Mauka Sewer Master Plan

HCDA

10/30/2014

0 50 100 200

SCALE IN FEET

Discharge Manhole Summary

ID	TOD Block	Alias	EX_DF	FUT_DWF	TOD_DWF	II5YR6HR	II5YR24HR
339665			0.00000	0.00000	0.00000	0.00000	0.00000
339739		offsite	0.01152	0.01610	0.01610	0.04279	0.02705
339841			0.00000	0.00000	0.00000	0.00000	0.00000
340006			0.00000	0.00000	0.00000	0.04190	0.02441
340015			0.00000	0.00000	0.00000	0.00000	0.00000
340032	Block 4	Mission Houses	0.00695	0.00695	0.00695	0.02429	0.01508
340195			0.00000	0.00000	0.00000	0.03503	0.02067
340260	Block 2	DOT, Honuakaha	0.09626	0.11840	0.11840	0.02698	0.01676
340282			0.00000	0.00000	0.00000	0.02875	0.01708
340287	Block 3	Kawaihao Church	0.01727	0.02120	0.02120	0.03828	0.02379
340340		offsite	0.00177	0.00250	0.00250	0.01177	0.00765
340426			0.00000	0.00000	0.00000	0.01768	0.01059
340475		offsite	0.56094	0.61704	0.61704	1.50347	0.95233
340479			0.01434	0.00000	0.00000	0.02211	0.01381
340482	Block 4		0.00000	0.01623	0.01557	0.00471	0.00000
340496		offsite	0.35958	0.50130	0.50130	0.59202	0.32204
340497			0.05024	0.00000	0.00000	0.00000	0.00494
340514			0.00000	0.00000	0.00000	0.00613	0.00000
340523			0.00000	0.00000	0.00000	0.00934	0.00488
340578	Block 3		0.02318	0.04157	0.03990	0.01148	0.00080
340654	Block 14	801 South Street	0.69336	0.64932	0.62983	0.01181	0.00000
340663			0.03196	0.00000	0.00000	0.05300	0.00000
340679			0.00000	0.00000	0.00000	0.00538	0.00000
340746			0.00132	0.00000	0.00000	0.03660	0.02384
340778			0.00000	0.00000	0.00000	0.01090	0.00000
340787		offsite	0.04570	0.04910	0.04910	0.09504	0.13863
340789			0.00000	0.00000	0.00000	0.00547	0.00011
340801			0.00198	0.00000	0.00000	0.00000	0.00000
340822	Block 5		0.00000	0.85568	0.82112	0.00789	0.00519
340845			0.00000	0.00000	0.00000	0.00000	0.00000
340852			0.00000	0.00000	0.00000	0.00000	0.00000
340860			0.00000	0.00000	0.00000	0.01228	0.00500
340869			0.00000	0.00000	0.00000	0.01364	0.01346
340876			0.00000	0.00000	0.00000	0.01727	0.01082
340917			0.00000	0.00000	0.00000	0.00000	0.00000
340961			0.00000	0.00000	0.00000	0.00000	0.00000
340969			0.00000	0.00000	0.00000	0.01660	0.01165
340971			0.00000	0.00000	0.00000	0.01208	0.00768
340995	Block 6TS	King St. Catholic Cemetary	0.00142	0.00142	0.00142	0.02613	0.02279
341034			0.00339	0.00000	0.00000	0.02823	0.00014
341052			0.00000	0.00000	0.00000	0.00000	0.04974
341080		offsite	14.51260	14.99830	14.99830	63.30600	65.38850
341082	Block 6TS	Honolulu Club, offsite	0.10729	0.10930	0.10930	0.09424	0.08080
341085			0.00000	0.00000	0.00000	0.01076	0.01061
341090			0.00000	0.00000	0.00000	0.02581	0.00766
341111			0.00000	0.00000	0.00000	0.00804	0.00790
341119			0.00000	0.00000	0.00000	0.00000	0.03224
341125			0.00000	0.00000	0.00000	0.01887	0.01912
341127			0.00303	0.00000	0.00000	0.01764	0.00960
341161			0.00000	0.00000	0.00000	0.00259	0.00125
341165			0.00000	0.00000	0.00000	0.02285	0.00889
341183	Block 14	Royal Capitol	0.18823	0.31192	0.30268	0.03763	0.00185
341186			0.00000	0.00000	0.00000	0.00000	0.00000
341193			0.00000	0.00000	0.00000	0.01626	0.00008
341195			0.00000	0.00000	0.00000	0.02536	0.02475
341199			0.00000	0.00000	0.00000	0.00000	0.00000
341205			0.00000	0.00000	0.00000	0.00000	0.00000
341243			0.00000	0.00000	0.00000	0.00567	0.00208
341252			0.00000	0.00000	0.00000	0.01558	0.01028
341258			0.00000	0.00000	0.00000	0.00605	0.00638
341263	Block 17		0.00000	0.11237	0.10783	0.00061	0.00059
341270	Block 7B+C	Blasidell 50%	0.07103	0.82167	0.75657	0.13390	0.12418
341283		offsite	0.03694	0.03980	0.03980	0.09922	0.09216
341308			0.01583	0.00000	0.00000	0.01091	0.00700
341328			0.00000	0.00000	0.00000	0.01075	0.00754
341331	Block 45 (KSA)	Keahou Lane	0.40590	0.38614	0.37401	0.04364	0.03970
341339			0.00000	0.00000	0.00000	0.01719	0.01137
341360			0.00181	0.00000	0.00000	0.02045	0.01032
341372			0.00000	0.00000	0.00000	0.00910	0.00445
341383			0.00000	0.00000	0.00000	0.01495	0.00952
341389			0.00000	0.00000	0.00000	0.02653	0.02458
341402			0.01145	0.00000	0.00000	0.01864	0.01214
341403			0.00000	0.00000	0.00000	0.01326	0.01156

ID	TOD Block	Alias	EX_DF	FUT_DWF	TOD_DWF	II5YR6HR	II5YR24HR
341407	Block 17 , Block 24	Imperial Plaza	0.14731	0.18120	0.18120	0.00000	0.00000
341418	Block 6TS	Royal Court, HECO	0.10100	0.10100	0.10100	0.02560	0.01462
341424			0.00000	0.00000	0.00000	0.01092	0.00451
341438			0.06054	0.00000	0.00000	0.00111	0.00071
341444			0.00000	0.00000	0.00000	0.00263	0.00050
341468			0.00000	0.00000	0.00000	0.04100	0.04820
341490			0.00000	0.00000	0.00000	0.01244	0.01277
341491			0.00278	0.00000	0.00000	0.01720	0.00769
341498	Block 6, Block 18	Symphony Park	0.01289	0.35656	0.34216	0.00450	0.00432
341504			0.00000	0.00000	0.00000	0.05522	0.03481
341508			0.00000	0.00000	0.00000	0.00168	0.00000
341511			0.00000	0.00000	0.00000	0.00264	0.00000
341527	Block 46	Halekauwila Place	0.56720	0.56720	0.56720	0.00628	0.00617
341533			0.00000	0.00000	0.00000	0.01804	0.01544
341556			0.00000	0.00000	0.00000	0.01659	0.01675
341557	Block 41, Block 44		0.00876	0.25867	0.54971	0.00014	0.00007
341561			0.00000	0.00000	0.00000	0.00869	0.00868
341574			0.00000	0.00000	0.00000	0.00979	0.00825
341588			0.02017	0.00000	0.00000	0.02090	0.02093
341598			0.00000	0.00000	0.00000	0.00000	0.00000
341599			0.00000	0.00000	0.00000	0.00000	0.00000
341601			0.00114	0.00000	0.00000	0.01219	0.00713
341615			0.00000	0.00000	0.00000	0.00690	0.00630
341617			0.00000	0.00000	0.00000	0.01167	0.01176
341619			0.02293	0.00000	0.00000	0.00503	0.00353
341625			0.00000	0.00000	0.00000	0.00002	0.00006
341634	Block 43	Pohulani	0.19786	0.16764	0.16764	0.03363	0.01347
341656			0.03028	0.00000	0.00000	0.01732	0.01773
341660			0.00148	0.00000	0.00000	0.01173	0.00884
341677			0.00000	0.00000	0.00000	0.01283	0.01293
341729			0.00047	0.00000	0.00000	0.00421	0.00433
341730			0.00441	0.00000	0.00000	0.00000	0.01520
341743			0.00000	0.00000	0.00000	0.00417	0.00435
341764			0.02944	0.00000	0.00000	0.00464	0.00397
341780			0.00000	0.00000	0.00000	0.05342	0.05310
341782			0.00000	0.00000	0.00000	0.02470	0.03080
341786			0.00000	0.00000	0.00000	0.01971	0.02000
341787	Block 26, Block 28		0.01414	0.18613	0.17861	0.01714	0.01686
341794	Block 47	Mother Waldron Park	0.00000	0.00048	0.00046	0.00370	0.00361
341797			0.00000	0.00000	0.00000	0.01066	0.01061
341798			0.00000	0.00000	0.00000	0.00749	0.00783
341803			0.00065	0.00000	0.00000	0.01161	0.01074
341812			0.00407	0.00000	0.00000	0.01942	0.01834
341814			0.00000	0.00000	0.00000	0.01368	0.01306
341826			0.00175	0.00000	0.00000	0.00728	0.00738
341852	Block 24	803 Waimanu	0.10110	0.18274	0.17700	0.01418	0.01380
341904			0.00000	0.00000	0.00000	0.01465	0.01438
341914			0.00000	0.00000	0.00000	0.00623	0.00604
341927			0.00000	0.00000	0.00000	0.00000	0.00676
341934			0.01335	0.00000	0.00000	0.00454	0.00439
341935			0.00000	0.00000	0.00000	0.01438	0.01196
341945			0.00868	0.00000	0.00000	0.01306	0.01273
341964			0.00000	0.00000	0.00000	0.01075	0.01073
341965			0.00000	0.00000	0.00000	0.00357	0.00367
341967			0.02831	0.00000	0.00000	0.01566	0.01508
341970			0.02984	0.00000	0.00000	0.00289	0.00297
341976			0.05047	0.00000	0.00000	0.01201	0.01159
341980			0.00000	0.00000	0.00000	0.00808	0.00735
342021			0.00000	0.00000	0.00000	0.01394	0.00897
342026			0.01069	0.00000	0.00000	0.01309	0.01291
342028			0.00000	0.00000	0.00000	0.01249	0.01237
342039			0.00906	0.00000	0.00000	0.00982	0.00976
342049			0.00466	0.00000	0.00000	0.00910	0.00901
342056	Block 30R		0.00391	0.08895	0.08536	0.00268	0.00265
342065			0.00000	0.00000	0.00000	0.00336	0.00318
342078	Block 19		0.00000	0.25239	0.50091	0.00785	0.00843
342079			0.00000	0.00000	0.00000	0.00250	0.00770
342081			0.00424	0.00000	0.00000	0.00000	0.00000
342082			0.00000	0.00000	0.00000	0.01584	0.01567
342088	Block 25		0.00000	0.03565	0.03421	0.00000	0.08502
342093			0.00706	0.00000	0.00000	0.01182	0.01171
342098			0.00000	0.00000	0.00000	0.00000	0.00000
342111	Block 30R	Kauhale Kaka'ako	0.18176	0.22360	0.22360	0.00795	0.00777

ID	TOD Block	Alias	EX_DF	FUT_DWF	TOD_DWF	II5YR6HR	II5YR24HR
342114			0.00381	0.00000	0.00000	0.01434	0.01434
342145			0.01049	0.00000	0.00000	0.01248	0.01238
342150			0.00928	0.00000	0.00000	0.00468	0.00454
342154			0.00209	0.00000	0.00000	0.00391	0.00382
342157	Block 27		0.00000	0.04052	0.03888	0.01047	0.01087
342161			0.00000	0.00000	0.00000	0.00333	0.00341
342162			0.00678	0.00000	0.00000	0.00621	0.00621
342168			0.00000	0.00000	0.00000	0.00992	0.01045
342180			0.00000	0.00000	0.00000	0.02097	0.03948
342199			0.00172	0.00000	0.00000	0.03761	0.04904
342202	Block HH5, Block 48N, Block 55 (KSD)	Block G West	0.01309	1.09140	1.18000	0.00629	0.00499
342207			0.00238	0.00000	0.00000	0.00758	0.00753
342208			0.00769	0.00000	0.00000	0.01408	0.01421
342210			0.00573	0.00000	0.00000	0.00337	0.00324
342212			0.00000	0.00000	0.00000	0.01050	0.01510
342221			0.00000	0.00000	0.00000	0.00616	0.00574
342231			0.00000	0.00000	0.00000	0.00194	0.00330
342244	Block 29		0.00000	0.01637	0.01571	0.05083	0.05250
342247	Block 7B+C	Blasidell 50%	0.00000	0.81670	0.75160	0.00000	0.00000
342248			0.00157	0.00000	0.00000	0.00487	0.00483
342249			0.00672	0.00000	0.00000	0.00551	0.00558
342253			0.00000	0.00000	0.00000	0.00000	0.00000
342258			0.04589	0.00000	0.00000	0.00381	0.00371
342261			0.01044	0.00000	0.00000	0.00500	0.00528
342283			0.02484	0.00000	0.00000	0.00255	0.00179
342308			0.00137	0.00000	0.00000	0.01132	0.00837
342309			0.00000	0.00000	0.00000	0.02204	0.03036
342320			0.00000	0.00000	0.00000	0.00790	0.00725
342321			0.00000	0.00000	0.00000	0.01556	0.01691
342348			0.00577	0.00000	0.00000	0.01685	0.01674
342353			0.00700	0.00000	0.00000	0.00922	0.00864
342356			0.01175	0.00000	0.00000	0.00496	0.00524
342357			0.02584	0.00000	0.00000	0.00645	0.00301
342358			0.00000	0.00000	0.00000	0.00000	0.00000
342367			0.00499	0.00000	0.00000	0.00751	0.00749
342369			0.00000	0.00000	0.00000	0.01101	0.00000
342376			0.00000	0.00000	0.00000	0.00000	0.00000
342385			0.00667	0.00000	0.00000	0.01018	0.00791
342391			0.00000	0.00000	0.00000	0.00770	0.02080
342394			0.00841	0.00000	0.00000	0.00628	0.00578
342398			0.00000	0.00000	0.00000	0.03283	0.02430
342402			0.02716	0.00000	0.00000	0.02440	0.02461
351395			0.00000	0.00000	0.00000	0.00000	0.00000
351559			0.00000	0.00000	0.00000	0.01607	0.01453
351590		offsite	0.00823	0.00880	0.00880	0.01625	0.01441
351697			0.00000	0.00000	0.00000	0.02517	0.01944
351789			0.02399	0.00000	0.00000	0.00670	0.00428
351869		offsite	0.56571	0.60780	0.60780	0.81173	0.63989
351871			0.00000	0.00000	0.00000	0.00465	0.00273
351958			0.00000	0.00000	0.00000	0.00363	0.00214
352086			0.05461	0.00000	0.00000	0.01452	0.00812
352091			0.00000	0.00000	0.00000	0.00090	0.00092
352146			0.00000	0.00000	0.00000	0.00091	0.00148
352166			0.00000	0.00000	0.00000	0.00418	0.00110
352253			0.00000	0.00000	0.00000	0.00188	0.00000
352389	Block 8, Block 9		0.00000	0.10987	0.10543	0.00357	0.00210
352390			0.02167	0.00000	0.00000	0.00311	0.00183
352471			0.00000	0.00000	0.00000	0.00137	0.00184
352602			0.00000	0.00000	0.00000	0.01067	0.01182
352620			0.00000	0.00000	0.00000	0.00834	0.00863
352633			0.00000	0.00000	0.00000	0.00627	0.00317
352644			0.00000	0.00000	0.00000	0.00000	0.00000
352653			0.00000	0.00000	0.00000	0.03043	0.02990
352674			0.00000	0.00000	0.00000	0.00000	0.00000
352684			0.00000	0.00000	0.00000	0.00118	0.00131
352759			0.00271	0.00000	0.00000	0.00517	0.00401
352777			0.00000	0.00000	0.00000	0.04301	0.00134
352821			0.00000	0.00000	0.00000	0.00241	0.00112
352831			0.00000	0.00000	0.00000	0.00000	0.00000
352864	Block 10, Block 11		0.02212	0.07489	0.07186	0.00261	0.00199
352912		offsite	4.17971	5.30620	5.30620	4.75938	5.32158
352940			0.00542	0.00000	0.00000	0.02418	0.03114
352965	Block 13		0.00000	0.09219	0.08847	0.01499	0.01991

ID	TOD Block	Alias	EX_DF	FUT_DWF	TOD_DWF	II5YR6HR	II5YR24HR
352972			0.00000	0.00000	0.00000	0.00538	0.00620
353056			0.00000	0.00000	0.00000	0.00960	0.01098
353059			0.00000	0.00000	0.00000	0.00972	0.01246
353085			0.00000	0.00000	0.00000	0.00738	0.00803
353096			0.00000	0.00000	0.00000	0.01230	0.01630
353106	Block 12		0.00000	0.04584	0.04399	0.00605	0.00675
353205			0.00000	0.00000	0.00000	0.00497	0.00756
379475			0.00115	0.00000	0.00000	0.01077	0.09161
379476		offsite	0.00448	0.00870	0.00870	0.03537	0.07820
379481			0.00000	0.00000	0.00000	0.00851	0.04428
379484			0.00000	0.00000	0.00000	0.02280	0.03117
379488			0.00000	0.00000	0.00000	0.00678	0.01687
379586			0.00000	0.00000	0.00000	0.00568	0.03034
379722			0.00000	0.00000	0.00000	0.00000	0.00000
379729			0.00076	0.00000	0.00000	0.01343	0.01894
379734			0.00000	0.00000	0.00000	0.00326	0.00324
379736	Block 61		0.00000	0.24216	0.23238	0.00368	0.00314
379737			0.01178	0.00000	0.00000	0.00000	0.00000
379754			0.00848	0.00000	0.00000	0.00564	0.00499
379756	Block HH5	Block G East	0.01076	1.56000	1.56000	0.01008	0.00884
379761			0.00000	0.00000	0.00000	0.02837	0.00000
379764			0.00825	0.00000	0.00000	0.01601	0.02261
379765			0.00733	0.00000	0.00000	0.00817	0.00803
379771			0.01614	0.00000	0.00000	0.00666	0.00589
379779			0.00000	0.00000	0.00000	0.00830	0.00622
379781			0.00000	0.00000	0.00000	0.00000	0.00000
379782	Block 7B+C	McKinley High School	0.12694	0.12694	0.12694	0.02800	0.00510
379786			0.00000	0.00000	0.00000	0.00000	0.00000
379790			0.00000	0.00000	0.00000	0.00000	0.00000
379792			0.00000	0.00000	0.00000	0.00000	0.00000
379795	Block 32		0.00000	0.05321	0.09254	0.00000	0.00000
379805			0.00000	0.00000	0.00000	0.00608	0.00952
379810			0.02464	0.00000	0.00000	0.00687	0.00642
379812			0.02357	0.00000	0.00000	0.00389	0.00181
379817			0.00000	0.00000	0.00000	0.01370	0.63330
379829			0.00000	0.00000	0.00000	0.01526	0.00000
379830	Block 34		0.00000	0.07599	0.07292	0.00709	0.00646
379831			0.00000	0.00000	0.00000	0.00000	0.00916
379855			0.00000	0.00000	0.00000	0.00000	0.00000
379857			0.00000	0.00000	0.00000	0.00415	0.00234
379870			0.00032	0.00000	0.00000	0.01010	0.18784
379873			0.00000	0.00000	0.00000	0.00496	0.03941
379874			0.00000	0.00000	0.00000	0.00000	0.00000
379875	Block 21		0.01899	0.16323	0.28574	0.00760	0.01231
379881			0.00000	0.00000	0.00000	0.01326	0.02474
379886			0.00000	0.00000	0.00000	0.00000	0.00000
379890			0.00000	0.00000	0.00000	0.00000	0.00000
379892			0.00000	0.00000	0.00000	0.00000	0.00000
379894			0.01361	0.00000	0.00000	0.02239	0.02998
379901			0.00000	0.00000	0.00000	0.00000	0.00003
379904			0.00456	0.00000	0.00000	0.00715	0.11439
379906			0.00000	0.00000	0.00000	0.00091	0.00060
379920			0.00000	0.00000	0.00000	0.00096	0.00054
379921			0.00000	0.00000	0.00000	0.00000	0.00000
379941			0.00000	0.00000	0.00000	0.00000	0.02562
379943			0.01182	0.00000	0.00000	0.00000	0.00000
379948			0.00142	0.00000	0.00000	0.01415	0.01520
379949			0.00000	0.00000	0.00000	0.00535	0.00369
379950			0.03167	0.00000	0.00000	0.00542	0.00156
379952			0.00000	0.00000	0.00000	0.33862	0.45957
379979			0.00000	0.00000	0.00000	0.00000	0.00000
379995			0.00000	0.00000	0.00000	0.00000	0.00907
380002			0.03418	0.00000	0.00000	0.00628	0.00437
380017			0.00000	0.00000	0.00000	0.02850	0.03726
380018			0.00000	0.00000	0.00000	0.00538	0.00000
380025			0.01011	0.00000	0.00000	0.00599	0.01529
380028			0.00000	0.00000	0.00000	0.00000	0.00233
380033			0.00000	0.00000	0.00000	0.01661	0.00000
380045			0.00000	0.00000	0.00000	0.00000	0.03803
380047	Block 38		0.00000	0.09905	0.17484	0.01986	0.03127
380055			0.00000	0.00000	0.00000	0.01090	0.00744
380067			0.00000	0.00000	0.00000	0.00000	0.01961
380104	Block 35		0.01280	0.02290	0.02290	0.00867	0.01286

ID	TOD Block	Alias	EX_DF	FUT_DWF	TOD_DWF	II5YR6HR	II5YR24HR
380106	Block 62 (HH1)	Block M	0.00000	0.81000	0.81000	0.00000	0.00646
380113			0.03502	0.00000	0.00000	0.00685	0.00484
380133	Block 37		0.00517	0.07283	0.13714	0.00480	0.00332
380147			0.00000	0.00000	0.00000	0.00000	0.00000
380149			0.00000	0.00000	0.00000	0.00556	0.00972
380159			0.00000	0.00000	0.00000	0.01176	0.01771
380189			0.00133	0.00000	0.00000	0.00899	0.01221
380202	Block 63H (HH3)	Block K	0.00000	0.39000	0.39000	0.00421	0.00865
380209			0.00000	0.00000	0.00000	0.00000	0.00000
380210			0.00000	0.00000	0.00000	0.01105	0.01713
380234			0.00209	0.00000	0.00000	0.00847	0.01106
380249			0.00356	0.00000	0.00000	0.01091	0.01458
380254	Block 36		0.00000	0.19108	0.28324	0.00383	0.00113
380260			0.00000	0.00000	0.00000	0.00623	0.00979
380263			0.00000	0.00000	0.00000	0.00511	0.00814
380268			0.00000	0.00000	0.00000	0.00000	0.00000
380270			0.00000	0.00000	0.00000	0.00193	0.00422
380272			0.00000	0.00000	0.00000	0.01104	0.01464
380283			0.00000	0.00000	0.00000	0.00000	0.00000
380285			0.00000	0.00000	0.00000	0.00882	0.01169
380287			0.00000	0.00000	0.00000	0.00000	0.00000
380289			0.00000	0.00000	0.00000	0.00000	0.00000
380312			0.00000	0.00000	0.00000	0.00921	0.01350
380333			0.00000	0.00000	0.00000	0.00641	0.00924
380336			0.00000	0.00000	0.00000	0.07342	0.00000
380338			0.00000	0.00000	0.00000	0.00000	0.00000
380347			0.00000	0.00000	0.00000	0.00563	0.00784
380351	Block 65 (HH4)	Block D, Block E/West	0.02666	0.86000	0.86000	0.01352	0.01799
380367			0.00000	0.00000	0.00000	0.00835	0.01388
380368			0.00000	0.00000	0.00000	0.00477	0.00636
380369			0.00000	0.00000	0.00000	0.00560	0.07810
380372			0.00000	0.00000	0.00000	0.00755	0.01231
380377			0.00000	0.00000	0.00000	0.00933	0.01233
380378			0.00000	0.00000	0.00000	0.00000	0.00000
380380			0.00000	0.00000	0.00000	0.01145	0.01558
380381			0.00000	0.00000	0.00000	0.01242	0.01709
380382			0.00000	0.00000	0.00000	0.00680	0.00892
380383			0.00000	0.00000	0.00000	0.01482	0.02223
380389			0.00000	0.00000	0.00000	0.00670	0.09060
380394			0.00000	0.00000	0.00000	0.00482	0.00682
380397			0.00000	0.00000	0.00000	0.00820	0.10270
380398	Block 63E	Nauru Tower	0.32337	0.31009	0.29899	0.00000	0.00000
380400			0.00000	0.00000	0.00000	0.00548	0.01065
380402		offsite	22.00120	22.42880	22.42880	0.01919	0.00000
380404	Block 63E	1350 Ala Moana	0.22320	0.27450	0.27450	0.01904	0.00000
380405			0.00000	0.00000	0.00000	0.00000	0.00000
380962		offsite	0.00330	0.00640	0.00640	0.01466	0.01522
381297			0.00000	0.00000	0.00000	0.00813	0.00446
381340			0.03002	0.00000	0.00000	0.00630	0.00603
381342			0.00000	0.00000	0.00000	0.00875	0.01224
381401			0.00000	0.00000	0.00000	0.00969	0.01253
381442			0.00000	0.00000	0.00000	0.00619	0.00770
381454			0.00000	0.00000	0.00000	0.00784	0.00983
381561			0.00000	0.00000	0.00000	0.00377	0.00528
381567			0.00000	0.00000	0.00000	0.00781	0.00863
381642			0.09721	0.00000	0.00000	0.00392	0.01026
381648			0.00000	0.00000	0.00000	0.00623	0.00538
381684			0.00000	0.00000	0.00000	0.00000	-0.14905
381771			0.00000	0.00000	0.00000	0.00000	0.00000
381780	Block 23	offsite	0.02111	0.10598	0.10250	0.02605	0.04760
381816			0.00000	0.00000	0.00000	0.00000	0.00000
381836			0.00000	0.00000	0.00000	0.00926	0.01284
381994			0.03303	0.00000	0.00000	0.02648	0.03403
382153	Block 39		0.01799	0.10929	0.12556	0.05771	0.07586
683492			0.00000	0.00000	0.00000	0.00000	0.00000
683559			0.00000	0.00000	0.00000	0.01358	0.00828
683582			0.00000	0.00000	0.00000	0.00457	0.00000
683588			0.00000	0.00000	0.00000	0.00921	0.00606
683592			0.00000	0.00000	0.00000	0.01359	0.00555
683617			0.00000	0.00000	0.00000	0.03858	0.02211
683632			0.00000	0.00000	0.00000	0.01482	0.00295
683634	Block 2	HFD Station and Museum	0.03750	0.02680	0.02680	0.00801	0.00000
683647			0.00000	0.00000	0.00000	0.02377	0.01399

ID	TOD Block	Alias	EX_DF	FUT_DWF	TOD_DWF	II5YR6HR	II5YR24HR
683669		Federal Building	0.04723	0.04723	0.04723	0.02819	0.01826
683689	Block 1, Block 51	US Courthouse, Restaurant Row	0.27642	0.26738	0.25658	0.04321	0.02515
683693	Block 1		0.00308	0.12996	0.12471	0.00206	0.00071
683714			0.01425	0.00000	0.00000	0.03635	0.01639
683742			0.00000	0.00000	0.00000	0.00000	0.00000
683750			0.00046	0.00000	0.00000	0.02490	0.01221
683754	offsite		2.16049	3.00310	3.00310	0.04458	0.04278
683760			0.00140	0.00000	0.00000	0.00000	0.00000
683766			0.00000	0.00000	0.00000	0.05306	0.02978
683784			0.00000	0.00000	0.00000	0.00954	0.00529
683789			0.00000	0.00000	0.00000	0.02389	0.02284
683801			0.00000	0.00000	0.00000	0.00000	0.04544
683858			0.00000	0.00000	0.00000	0.02384	0.01378
683866			0.00000	0.00000	0.00000	0.00000	0.00000
683871			0.00000	0.00000	0.00000	0.00600	0.01282
683872			0.00000	0.00000	0.00000	0.01209	0.01159
683899			0.01648	0.00000	0.00000	0.02994	0.02778
683904			0.00000	0.00000	0.00000	0.00000	0.00722
683927			0.00000	0.00000	0.00000	0.07134	0.13891
683930	Block 46	690 Pohukaina	0.00462	0.64836	0.62896	0.01513	0.01918
683933			0.00000	0.00000	0.00000	0.06754	0.00000
683960	Block 53		0.01559	0.08070	0.15000	0.01632	0.01597
683996			0.00000	0.00000	0.00000	0.00000	0.00000
683997			0.00000	0.00000	0.00000	0.00000	0.00000
684015	Block 52 (KSB)	400/440 Keawe Street	0.00000	0.11144	0.10794	0.03930	0.03970
684033			0.00000	0.00000	0.00000	0.00000	0.00000
684041			0.00000	0.00000	0.00000	0.00000	0.00560
684047			0.00000	0.00000	0.00000	0.00000	0.00000
684050			0.00000	0.00000	0.00000	0.00000	0.00000
684051			0.00000	0.00000	0.00000	0.61570	0.59490
684052			0.00000	0.00000	0.00000	0.05406	0.06547
684074	Block 57	The Collection	0.30520	0.28151	0.27266	0.00637	0.00398
684075			0.00000	0.00000	0.00000	0.00000	0.00000
684091			0.00000	0.00000	0.00000	0.01053	0.01057
684110			0.00533	0.00000	0.00000	0.00228	0.00108
684119			0.00000	0.00000	0.00000	0.00579	0.00593
684126			0.00000	0.00000	0.00000	0.00000	0.00000
684135			0.00000	0.00000	0.00000	0.01035	0.01036
684148			0.00000	0.00000	0.00000	0.00000	0.00000
684149			0.00000	0.00000	0.00000	0.26268	0.00000
684151			0.00000	0.00000	0.00000	0.05357	0.05554
684153			0.00000	0.00000	0.00000	0.01328	0.00000
684163			0.00000	0.00000	0.00000	0.00000	0.00000
684170			0.00000	0.00000	0.00000	0.00000	0.00000
684173			0.00000	0.00000	0.00000	0.01043	0.01049
684177	Block 58		0.00000	0.24532	0.23509	0.01949	0.00000
684182			0.00000	0.00000	0.00000	0.00000	0.00000
684191			0.00000	0.00000	0.00000	0.00406	0.00917
684192			0.00521	0.00000	0.00000	0.00050	0.00036
684197			0.00000	0.00000	0.00000	0.00000	0.00000
684204			0.00000	0.00000	0.00000	0.00211	0.00423
684209			0.01593	0.00000	0.00000	0.00383	0.00249
684216			0.00000	0.00000	0.00000	0.01408	0.02308
684244	Block 54 (KSC)		0.00000	0.22326	0.47158	0.02186	0.02268
684251			0.00000	0.00000	0.00000	43.15100	37.84970
684290			0.00000	0.00000	0.00000	0.00569	0.00000
684291	Block 59		0.00000	0.16784	0.16106	0.00498	0.00353
684295			0.00000	0.00000	0.00000	0.00974	0.01496
684296			0.00000	0.00000	0.00000	0.14237	0.10308
684297			0.00000	0.00000	0.00000	0.00000	0.00000
684298			0.00000	0.00000	0.00000	0.05926	0.06550
684299			0.00000	0.00000	0.00000	0.00000	0.00000
684301			0.00000	0.00000	0.00000	0.00000	0.00000
684302			0.00000	0.00000	0.00000	0.00794	0.02363
684305			0.00000	0.00000	0.00000	0.07955	0.09806
684318			0.00000	0.00000	0.00000	0.00000	0.45200
684321	Block 60		0.00292	0.14420	0.13837	0.00502	0.00369
1004956			0.01228	0.00000	0.00000	0.00942	0.00534
1004976			0.00000	0.00000	0.00000	0.00930	0.00504
2023299			0.00000	0.00000	0.00000	0.00093	0.00403
2023413	Block 34	Kamakee Vista	0.15868	0.19520	0.19520	0.01062	0.01371
3010699	Block 2	Department of Transportation	0.01667	0.02050	0.02050	0.01038	0.00678
3010701			0.00099	0.00000	0.00000	0.01280	0.00049

ID	TOD Block	Alias	EX_DF	FUT_DWF	TOD_DWF	II5YR6HR	II5YR24HR
3010712	Block 2		0.00122	0.15419	0.14796	0.01656	0.00955
3010721			0.00000	0.00000	0.00000	0.00000	0.01393
3010952	Block 64 (HH2)	Block C	0.00000	0.39000	0.39000	0.00000	0.00000
3010954			0.00000	0.00000	0.00000	0.00178	0.00434
3010956			0.00000	0.00000	0.00000	0.00030	0.00251
3010959			0.00000	0.00000	0.00000	0.00000	0.00000
3013634			0.01150	0.00000	0.00000	0.01958	0.01750
3014917			0.00000	0.00000	0.00000	0.06470	0.12944
4009797			0.00000	0.00000	0.00000	0.40377	1.25210
4013594			0.00000	0.00000	0.00000	0.01152	0.01598
4013595			0.00000	0.00000	0.00000	0.00000	0.00000
4013598			0.00000	0.00000	0.00000	0.00372	0.00511
4013626			0.00322	0.00000	0.00000	0.00582	0.00547
4013729			0.00000	0.00000	0.00000	0.00290	0.00295
4013730	Block 6TS	One Archer Lane	0.20890	0.20890	0.20890	0.00793	0.00806
4013732			0.00000	0.00000	0.00000	0.00000	0.00000
4013760	Block 63E	Waihonua, Hawaiki Tower	0.50197	0.61740	0.61740	0.00000	0.00000
4014268			0.00000	0.00000	0.00000	0.00046	0.00079
4014270			0.00000	0.00000	0.00000	0.00251	0.00345
4014272			0.00000	0.00000	0.00000	0.00374	0.00509
4014274			0.00000	0.00000	0.00000	0.01508	0.01988
4014276			0.03167	0.00000	0.00000	0.01477	0.01983
4014278	Block 62 (HH1)	Block J, Ward Entertainment Complex	0.13590	0.13590	0.13590	0.01613	0.01997
4014280			0.00000	0.00000	0.00000	0.01604	0.01917
4020183			0.00000	0.00000	0.00000	0.00917	0.00386
4020187			0.00443	0.00000	0.00000	0.01559	0.00620
4020189			0.01210	0.00000	0.00000	0.00516	0.00160
4025637			0.00000	0.00000	0.00000	0.00000	0.00000
4025638			0.00000	0.00000	0.00000	0.00000	0.11149
4025640			0.00000	0.00000	0.00000	0.00000	0.19446
4025642	Block 57	The Collection	0.00000	0.29552	0.28320	0.00000	0.19165
4025645			0.00000	0.00000	0.00000	0.00000	0.00000
4025647	Block 52X	One Waterfront Towers	0.21764	0.21764	0.21764	0.00000	0.02025
4025650			0.00000	0.00000	0.00000	1.33863	0.00000
4025653			0.00853	0.00000	0.00000	0.00000	0.00000
4025655			0.00000	0.00000	0.00000	0.00000	0.00000
4025657			0.00000	0.00000	0.00000	0.00000	0.00000
4025660			0.00000	0.00000	0.00000	0.00000	0.02715
4025661			0.00000	0.00000	0.00000	0.00000	0.04020
4025663			0.00000	0.00000	0.00000	0.00000	0.13375
4025665			3.10250	3.87610	3.87610	0.00000	0.18505
4026531			0.00000	0.00000	0.00000	0.01917	0.02714
4026534	Block 42		0.00000	0.23396	0.49520	0.00000	0.01158
4026536	Block 43		0.00123	0.21050	0.27100	0.02058	0.01100
4026538			0.00275	0.00000	0.00000	0.01066	0.00799
4026540			0.00000	0.00000	0.00000	0.00673	0.00446
4026542			0.00000	0.00000	0.00000	0.00106	0.00068
4026546			0.01010	0.00000	0.00000	0.01025	0.00812
4026560			0.00000	0.00000	0.00000	0.00095	0.00067
4026561			0.00000	0.00000	0.00000	0.00142	0.00133
4026562			0.00000	0.00000	0.00000	0.00019	0.00006
4026564			0.00143	0.00000	0.00000	0.00944	0.00492
4026566			0.00000	0.00000	0.00000	0.01006	0.00350
4026568	Block 16	Pacific Park Plaza	0.04693	0.04539	0.04356	0.01153	0.00202
4026584			0.00000	0.00000	0.00000	0.01940	0.01929
4026586			0.00672	0.00000	0.00000	0.00783	0.00811
4026597			0.00000	0.00000	0.00000	0.00000	0.00000
4026599	Block 15		0.00448	0.21751	0.36621	0.00046	0.00000
4026601			0.00000	0.00000	0.00000	0.00000	0.00000
4026688			0.00000	0.00000	0.00000	0.00000	0.00000
4026690			0.00000	0.00000	0.00000	0.00000	0.00000
4026691	Block 61	Block A	0.00000	0.42000	0.42000	0.00000	0.00000
4038807			0.00000	0.00000	0.00000	0.07689	0.12575
4038809	Block 63E , Block 65 (HH4)	Hokua, Block E East	0.18444	0.22690	0.22690	0.00158	0.01756
4038811			0.00000	0.00000	0.00000	0.00638	0.03810
4038813	Block 63E	Koolani	0.24377	0.29980	0.29980	0.00788	0.01780
4038817	Block 63H (HH3)	Block K, Block L	0.04623	0.05690	0.05690	0.00788	0.01780
4039005			0.00000	0.00000	0.00000	0.00054	0.00071
4042830			0.00000	0.00000	0.00000	0.00000	0.25440
4044086			0.00000	0.00000	0.00000	0.00443	0.00622
4044526			0.00000	0.00000	0.00000	0.00000	0.00000
4044793			0.00000	0.00000	0.00000	0.00629	0.00000
4044866			0.00000	0.00000	0.00000	0.00296	0.00284

ID	TOD Block	Alias	EX_DF	FUT_DWF	TOD_DWF	II5YR6HR	II5YR24HR
4046051			0.00000	0.00000	0.00000	0.00000	0.13280
4046053			0.00000	0.00000	0.00000	0.00000	0.00000
4046055			0.00000	0.00000	0.00000	0.00000	0.00000
4046375			0.00000	0.00000	0.00000	0.00000	0.00000
4046377			0.00000	0.00000	0.00000	0.00361	0.01052
4046379			0.00000	0.00000	0.00000	0.00462	0.00703
4046381			0.00000	0.00000	0.00000	0.00602	0.00586
4046383			0.00000	0.00000	0.00000	0.00598	0.00558
4046385	Block 35	1133 Waimanu	0.17700	0.17700	0.17700	0.00679	0.00809
4047055			0.00326	0.00000	0.00000	0.00351	0.00471
4047061	Block 35		0.00858	0.18825	0.18065	0.00209	0.00275
4047068			0.00000	0.00000	0.00000	0.00872	0.01019
4047071			0.00421	0.00000	0.00000	0.00100	0.00033
4051543			0.00000	0.00000	0.00000	0.00000	0.00000
4055477	Block 40	Keola Lai	0.22595	0.22595	0.22595	0.01494	0.00984
4065243			0.00000	0.00000	0.00000	0.02089	0.00905
4065244			0.00000	0.00000	0.00000	0.00156	0.00271
4065246	Block 22	Honolulu Design Center	0.09710	0.09710	0.09710	0.00000	0.00000
4065248			0.00000	0.00000	0.00000	0.00247	0.00244
4065254			0.00000	0.00000	0.00000	0.00247	0.00244
4065256			0.00000	0.00000	0.00000	0.00000	0.00000
4065260	Block 22	Moana Pacific	0.88737	0.83008	0.80532	0.00000	0.00000
4065988	Block 31		0.00000	0.07238	0.06946	0.00260	0.00276
4065989	Block 20	909 Kapi'olani	0.14690	0.14690	0.14690	0.00843	0.00885
4065994			0.00000	0.00000	0.00000	0.00589	0.00587
4065995			0.00000	0.00000	0.00000	0.77647	0.80853
4066890			0.00000	0.00000	0.00000	0.00134	0.00148
4068852			0.00000	0.00000	0.00000	0.00443	0.00452
4070284			0.00000	0.00000	0.00000	0.00000	0.00000
4070286			0.00000	0.00000	0.00000	0.00000	0.00000
4070522	Block 44	Nā Le Hulu Kūpuna	0.05780	0.05780	0.05780	0.00000	0.00000
4073046	Block 6Kap	Vanguard Apartments	0.02497	0.02415	0.02318	0.00000	0.00000
4073048			0.00000	0.00000	0.00000	0.00000	0.00000
4075025			0.00000	0.00000	0.00000	0.00000	0.00000
4075027			0.00000	0.00000	0.00000	0.00000	0.00000
4075030			0.00000	0.00000	0.00000	0.00000	0.00000
4075347			0.00000	0.00000	0.00000	0.00000	0.00000
4075352			0.00000	0.00000	0.00000	0.00000	0.00000
4075362			0.00000	0.00000	0.00000	0.00000	0.00000
4075370			0.00000	0.00000	0.00000	0.00000	0.00000
4075372	Block 20	Pacifica Honolulu	0.31144	0.38310	0.38310	0.00000	0.00000
4075943			0.00000	0.00000	0.00000	0.00000	0.00000
4075945			0.00000	0.00000	0.00000	0.00000	0.00000
4075947			0.00000	0.00000	0.00000	0.00000	0.00000
4075949			0.00000	0.00000	0.00000	0.00000	0.00000
4075951			0.00000	0.00000	0.00000	0.00000	0.00000
4075957			0.00440	0.00000	0.00000	0.00000	0.00000
4075961	Block 33		0.00315	0.13378	0.12837	0.00000	0.00000
4075962			0.00000	0.00000	0.00000	0.00000	0.00000
4075963	Block 20		0.00000	0.27384	0.26278	0.00000	0.00000
4075964			0.00028	0.00000	0.00000	0.00000	0.00000
4076017			0.00000	0.00000	0.00000	0.00000	0.00000
4076018			0.00000	0.00000	0.00000	0.00000	0.00000
4076088		offsite	5.76041	7.31300	7.31300	0.00000	0.00000
4077063			0.00000	0.00000	0.00000	0.00000	0.00000
4079658			0.00000	0.00000	0.00000	0.00000	0.00000
4079920			0.00000	0.00000	0.00000	0.00000	0.00000
4079921			0.01202	0.00000	0.00000	0.00000	0.00000
4079929			0.13460	0.00000	0.00000	0.00000	0.00000
4079935			0.00000	0.00000	0.00000	0.00000	0.00000
4100473			0.00000	0.00000	0.00000	0.00000	0.00000
4100725			0.00000	0.00000	0.00000	0.00000	0.00000
4100729			0.00000	0.00000	0.00000	0.00000	0.00000
4100731			0.00000	0.00000	0.00000	0.00000	0.00000
4100733			0.00000	0.00000	0.00000	0.00000	0.00000
4100735			0.00000	0.00000	0.00000	0.00000	0.00000
9000001	Block 64 (HH2)	Block B West	0.00000	0.30000	0.30000	0.00000	0.00000
9000002			0.00000	0.00000	0.00000	0.00000	0.00000
9000003	Block 62 (HH1)	Block N East, Block N West	0.00000	1.08000	1.08000	0.00000	0.00000
9000004			0.00000	0.00000	0.00000	0.00000	0.00000
9000005			0.00000	0.00000	0.00000	0.00000	0.00000
9000006			0.00000	0.00000	0.00000	0.00000	0.00000
9000007			0.00000	0.00000	0.00000	0.00000	0.00000

ID	TOD Block	Alias	EX_DF	FUT_DWF	TOD_DWF	II5YR6HR	II5YR24HR
9000008			0.00000	0.00000	0.00000	0.00000	0.00000
9000009			0.00000	0.00000	0.00000	0.00000	0.00000
9000010	Block 62 (HH1), Block 64(HH2)	Block C West, Block I	0.00000	2.25000	2.25000	0.00000	0.00000
9000011	Block 62 (HH1), Block 64(HH2)	Block B East, Block H	0.00000	1.18000	1.18000	0.00000	0.00000
9000012	Block HH5	Block O	0.00000	0.75000	0.75000	0.00000	0.00000
9000013			0.00000	0.00000	0.00000	0.00000	0.00000
9000014			0.00000	0.00000	0.00000	0.00000	0.00000
9000015			0.00000	0.00000	0.00000	0.00000	0.00000
9000016	Block HH5	Block F East, Block F West	0.00000	0.87000	0.87000	0.00000	0.00000

	Land Use: Existing Condition											Water							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Commercial	General / Light Industry	Other	Average Day Flow
												500	400	350	69	69	92		
				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
RESTAURANT ROW	51	21029001 Pauahi					500,812				OFFICES	0	0	0	34557	0	0		34557
KEAHOU LANE	45 (KS A)	21030001 Pauahi			632			41,999			APARTMENT/COMMERCIAL	0	252800	0	0	2898	0		255698
COURTHOUSE - SINGLE STORY	1	21030003 Civic Center					68,300				OFFICES	0	0	0	4713	0	0		4713
	1	21030008 Civic Center							1,000		WAREHOUSE	0	0	0	0	0	92		92
	1	21030008 Civic Center					6,000				OFFICES	0	0	0	414	0	0		414
	1	21030013 Civic Center					2,874				OFFICES	0	0	0	199	0	0		199
	1	21030014 Civic Center							2,856		WAREHOUSE	0	0	0	0	0	263		263
	1	21030015 Civic Center					9,438				OFF ENCL WAREHSE	0	0	0	652	0	0		652
	1	21030017 Civic Center					19,907				OFFICES	0	0	0	1374	0	0		1374
	2	21031002 Civic Center					2,500				OFFICES	0	0	0	173	0	0		173
	2	21031005 Civic Center					1,533		1,533		OFFICES / WAREHOUSE	0	0	0	106	0	142		248
	2	21031008 Civic Center					22,753				BANK/SAVINGS INST/PARKING	0	0	0	1570	0	0		1570
DOT	2	21031010 Civic Center									PARK STRUCTURE	0	0	0	0	0	0		0
DOT	2	21031012 Civic Center					55,000				OFFICES	0	0	0	3795	0	0		3795
HFD HQ/Museum	2	21031015 Civic Center					50,050				OFFICES	0	0	0	3454	0	0		3454
HFD Kaka'ako Station	2	21031018 Civic Center					5,200				OFFICES	0	0	0	359	0	0		359
	2	21031019 Civic Center			6						APARTMENT	0	2400	0	0	0	0		2400
	2	21031020 Civic Center					14,200				OFFICES	0	0	0	980	0	0		980
HONUAKAHA	2	21031021 Civic Center			96		18,202				APARTMENT / OFFICES	0	38400	0	1256	0	0		39656
	2	21031024 Civic Center					11,410				OFFICES/PARKING	0	0	0	788	0	0		788
	42	21031030 Pauahi							26,800		AUTO PARTS/SERVICE	0	0	0	0	0	2466		2466
	42	21031032 Pauahi					2,284		5,450		OFFICES/WAREHOUSE	0	0	0	158	0	502		660
	42	21031033 Pauahi					17,554				OFFICES	0	0	0	1212	0	0		1212
	4	21032001 Civic Center					103,433				OFFICES/PARKING	0	0	0	7137	0	0		7137
Mission Houses	4	21032002 Civic Center					14,163				OFFICES	0	0	0	978	0	0		978
Mission Houses	4	21032002 Civic Center							420		LIGHT MANUFACTURING	0	0	0	0	0	39		39
	5	21032007 Civic Center							19,289		WAREHOUSE	0	0	0	0	0	1775		1775
	5	21032008 Civic Center		2							SF HOME	1000	0	0	0	0	0		1000
	5	21032009 Civic Center					4,079				OFFICES	0	0	0	282	0	0		282
	5	21032010 Civic Center							25,004		WAREHOUSE	0	0	0	0	0	2301		2301
	5	21032010 Civic Center					5,002				MEZZ ENCL OFFICE	0	0	0	346	0	0		346
	5	21032011 Civic Center							5,893		AUTO PARTS/SERVICE	0	0	0	0	0	543		543
	5	21032012 Civic Center					4,060		5,893		WAREHOUSE	0	0	0	281	0	543		824
	3	21032015 Civic Center								30,186	RELIGIOUS INST	0	0	0	0	0	0	2083 Commercial	2083
KAWAIHAO CHURCH	3	21032017 Civic Center								11,805	RELIGIOUS INST	0	0	0	0	0	0	815 Commercial	815
	3	21032017 Civic Center								4,977	SCHOOL	0	0	0	0	0	0	3780 60 gal/student	3780
	3	21032017 Civic Center					14,500				OFFICES	0	0	0	1001	0	0		1001
	3	21032022 Civic Center								6,192	SCHOOL	0	0	0	0	0	0	4680 60 gal/student	4680
	3	21032022 Civic Center					6,192				OFFICES	0	0	0	428	0	0		428
	3	21032023 Civic Center							2,262		WAREHOUSE	0	0	0	0	0	209		209
HECO	6TS	21044003 Thomas Square					15,385				OFFICES	0	0	0	1062	0	0		1062
HECO	6TS	21044003 Thomas Square							140,843		WAREHOUSE	0	0	0	0	0	12958		12958
	6TS	21044004 Thomas Square									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	6TS	21044004 Thomas Square					2,769				OFFICES	0	0	0	192	0	0		192
HONOLULU CLUB	6TS	21044005 Thomas Square					69,299				OFFICES	0	0	0	4782	0	0		4782
HONOLULU CLUB	6TS	21044005 Thomas Square								10912	RESTAURANT	0	0	0	0	0	0		0
HONOLULU CLUB	6TS	21044005 Thomas Square								38909	BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	18	21044022 Kapiolani					84,296				OFFICES	0	0	0	5817	0	0		5817
	18	21044022 Kapiolani						4,679			RETAIL STORE	0	0	0	0	323	0		323
	18	21044022 Kapiolani							9,933		WAREHOUSE	0	0	0	0	0	914		914
	18	21044023 Kapiolani						36,380			AUTO SHOWROOM/OFFICE	0	0	0	0	2511	0		2511
	18	21044023 Kapiolani									PARK STRUCTURE	0	0	0	0	0	0		0
	18	21044023 Kapiolani							28,196		AUTO PARTS/SERVICE	0	0	0	0	0	2595		2595
ROYAL COURT	6TS	21044033 Thomas Square			112						APARTMENT	0	44800	0	0	0	0		44800
	18	21044034 Kapiolani								4000	RESTAURANT	0	0	0	0	0	0	276 Commercial	276
	6TS	21044038 Thomas Square						1,749			CONVENIENCE STORE	0	0	0	0	121	0		121
ONE ARCHER LANE	6TS	21044041 Thomas Square			331						APARTMENT	0	132400	0	0	0	0		132400
VANGUARD LOFTS	6Kap	21044046 Kapiolani			38						APARTMENT	0	15200	0	0	0	0		15200
VANGUARD LOFTS	6Kap	21044046 Kapiolani						3616			AUTO SHOWROOM/OFFICE	0	0	0	0	250	0		250
	15	21046001 Kapiolani					3,857				MEZZ ENCL OFFICE	0	0	0	267	0	0		267
	15	21046001 Kapiolani							10,727		AUTO PARTS/SERVICE	0	0	0	0	0	987		987
	15	21046001 Kapiolani						3,814			AUTO SHOWROOM/OFFICE	0	0	0	0	264	0		264
	15	21046002 Kapiolani								11,446	RESTAURANT	0	0	0	0	0	0	790 Commercial	790
	15	21046002 Kapiolani					14,170				OFFICES	0	0	0	978	0	0		978
	15	21046003 Kapiolani					11,993				OFFICES	0	0	0	828	0	0		828
	15	21046005 Kapiolani					2,538				OFFICES	0	0	0	176	0	0		176
	15	21046005 Kapiolani					6,213				MEZZ ENCL OFFICE	0	0	0	429	0	0		429
	15	21046005 Kapiolani							6,213		WAREHOUSE	0	0	0	0	0	572		572
	15	21046007 Kapiolani					42,978				OFFICES	0	0	0	2966	0	0		2966
HO'OMANA NA'AUAAO O Hawai'i - CHURCH	15	21046009 Kapiolani								6,907	RELIGIOUS INST	0	0	0	0	0	0	477 Commercial	477
PACIFIC PARK PLAZA	16	21047001 Kapiolani					96,613				OFFICES	0	0	0	6667	0	0		6667
	14	21047002 Kapiolani									PARK STRUCTURE	0	0	0	0	0	0		0
801 SOUTH PH1	14	21047003 Kapiolani			636							0	254400	0	0	0	0		254400
801 SOUTH PH1	14	21047003 Kapiolani										0	0	0	0	0	0		0
801 SOUTH PH1	14	21047004 Kapiolani					66,593				OFFICES	0	0	0	4595	0	0		4595
801 SOUTH PH2	14	21047004 Kapiolani			410						APARTMENT	0	164000	0	0	0	0		164000
801 SOUTH PH2	14	21047004 Kapiolani										0	0	0	0	0	0		0

	Land Use: Existing Condition											Water							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Commercial	General / Light Industry	Other	Average Day Flow
												500	400	350	69	69	92		
				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
	14	21047005 Kapiolani						3,724			AUTO SHOWROOM/OFFICE	0	0	0	0	257	0		257
	14	21047005 Kapiolani							1,506		AUTO PARTS/SERVICE	0	0	0	0	0	139		139
	14	21047005 Kapiolani					3,984				OFFICES	0	0	0	275	0	0		275
ROYAL CAPITOL PLAZA	14	21047008 Kapiolani			297						APARTMENT	0	118800	0	0	0	0		118800
ROYAL CAPITOL PLAZA	14	21047008 Kapiolani						947			CONVENIENCE STORE	0	0	0	0	66	0		66
ROYAL CAPITOL PLAZA	14	21047008 Kapiolani							1,511		MINI-WAREHOUSE	0	0	0	0	0	140		140
	41	21048001 Pauahi							7,630		WAREHOUSE	0	0	0	0	0	702		702
	41	21048001 Pauahi					400				OFF ENCL WAREHSE	0	0	0	28	0	0		28
	41	21048002 Pauahi						7,985			RETAIL STORE	0	0	0	0	551	0		551
	41	21048005 Pauahi							5,158		WAREHOUSE	0	0	0	0	0	475		475
	41	21048005 Pauahi					3,996				MEZZ ENCL OFFICE	0	0	0	276	0	0		276
	41	21048006 Pauahi							40,491		WAREHOUSE	0	0	0	0	0	3726		3726
	41	21048006 Pauahi					19,096				MEZZ ENCL OFFICE	0	0	0	1318	0	0		1318
KEOLA LAI	40	21048008 Pauahi			353						APARTMENT	0	141200	0	0	0	0		141200
KEOLA LAI	40	21048008 Pauahi						8,607			RETAIL STORE	0	0	0	0	594	0		594
	41	21048022 Pauahi								1,334	RESTAURANT	0	0	0	0	0	0	93 Commercial	93
	41	21048022 Pauahi					812				OFFICES	0	0	0	57	0	0		57
	41	21048022 Pauahi			4						APARTMENT	0	1600	0	0	0	0		1600
	27	21049001 Central Kakaako							2,629		SERVICE STATION W/BAYS	0	0	0	0	0	242		242
	27	21049003 Central Kakaako			1						APARTMENT	0	400	0	0	0	0		400
	27	21049003 Central Kakaako					1,650				OFFICES	0	0	0	114	0	0		114
	27	21049004 Central Kakaako							2,100		WAREHOUSE	0	0	0	0	0	194		194
	27	21049005 Central Kakaako			2						APARTMENT	0	800	0	0	0	0		800
	26	21049008 Central Kakaako					4,917				OFFICES	0	0	0	340	0	0		340
	26	21049009 Central Kakaako							2,500		AUTO PARTS/SERVICE	0	0	0	0	0	230		230
	26	21049010 Central Kakaako							3,750		WAREHOUSE	0	0	0	0	0	345		345
	26	21049011 Central Kakaako					855				OFFICES	0	0	0	59	0	0		59
	26	21049011 Central Kakaako							27,860		WAREHOUSE	0	0	0	0	0	2564		2564
	26	21049012 Central Kakaako					902				OFFICES	0	0	0	63	0	0		63
	26	21049014 Central Kakaako							1,970		AUTO PARTS/SERVICE	0	0	0	0	0	182		182
	26	21049014 Central Kakaako					132				OFF ENCL WAREHSE	0	0	0	10	0	0		10
	26	21049015 Central Kakaako					700				OFFICES	0	0	0	49	0	0		49
	26	21049015 Central Kakaako							2,170		WAREHOUSE	0	0	0	0	0	200		200
	26	21049018 Central Kakaako					2,700				OFFICES	0	0	0	187	0	0		187
	26	21049019 Central Kakaako					14,940				OFFICES	0	0	0	1031	0	0		1031
	26	21049020 Central Kakaako									PARKING PAR/ENCL	0	0	0	0	0	0		0
	26	21049020 Central Kakaako						4,628			RETAIL STORE	0	0	0	0	320	0		320
	26	21049021 Central Kakaako							1,650		WAREHOUSE	0	0	0	0	0	152		152
	26	21049022 Central Kakaako							2,794		WAREHOUSE	0	0	0	0	0	258		258
	26	21049022 Central Kakaako					500				OFF ENCL WAREHSE	0	0	0	35	0	0		35
	26	21049023 Central Kakaako							6,750		WAREHOUSE	0	0	0	0	0	621		621
	26	21049024 Central Kakaako						1,428			RETAIL STORE	0	0	0	0	99	0		99
	26	21049025 Central Kakaako							4,250		WAREHOUSE	0	0	0	0	0	391		391
	26	21049026 Central Kakaako					808				OFFICES	0	0	0	56	0	0		56
	26	21049026 Central Kakaako								4,600	RESTAURANT	0	0	0	0	0	0	318 Commercial	318
IMPERIAL PLAZA	24	21049027 Central Kakaako			206						APARTMENT	0	82400	0	0	0	0		82400
IMPERIAL PLAZA	17	21049027 Central Kakaako						50,967			RETAIL STORE	0	0	0	0	3517	0		3517
IMPERIAL PLAZA	17	21049027 Central Kakaako					10,904				OFFICES	0	0	0	753	0	0		753
IMPERIAL PLAZA	17	21049027 Central Kakaako					483				MEZZ ENCL OFFICE	0	0	0	34	0	0		34
	26	21049028 Central Kakaako							3,600		WAREHOUSE	0	0	0	0	0	332		332
	26	21049029 Central Kakaako							2,000		WAREHOUSE	0	0	0	0	0	184		184
	26	21049030 Central Kakaako						846			MEZZ DISPLAY SALES	0	0	0	0	59	0		59
	26	21049030 Central Kakaako							5,000		WAREHOUSE	0	0	0	0	0	460		460
	26	21049031 Central Kakaako							3,945		WAREHOUSE	0	0	0	0	0	363		363
	26	21049032 Central Kakaako					1,000				MEZZ ENCL OFFICE	0	0	0	69	0	0		69
	26	21049032 Central Kakaako					1,000				OFFICES	0	0	0	69	0	0		69
	26	21049032 Central Kakaako							8,400		WAREHOUSE	0	0	0	0	0	773		773
	26	21049033 Central Kakaako					288				OFF ENCL WAREHSE	0	0	0	20	0	0		20
	26	21049033 Central Kakaako							3,285		WAREHOUSE	0	0	0	0	0	303		303
	26	21049037 Central Kakaako					200				OFFICES	0	0	0	14	0	0		14
	26	21049037 Central Kakaako							1,300		WAREHOUSE	0	0	0	0	0	120		120
	26	21049038 Central Kakaako					520				OFFICES	0	0	0	36	0	0		36
	26	21049038 Central Kakaako							4,000		WAREHOUSE	0	0	0	0	0	368		368
	24	21049040 Central Kakaako							4,000		WAREHOUSE	0	0	0	0	0	368		368
	24	21049041 Central Kakaako					3,000				OFFICES	0	0	0	207	0	0		207
	24	21049041 Central Kakaako							3,000		WAREHOUSE	0	0	0	0	0	276		276
	24	21049042 Central Kakaako							3,750		WAREHOUSE	0	0	0	0	0	345		345
	24	21049043 Central Kakaako						1,904			RETAIL STORE	0	0	0	0	132	0		132
	24	21049043 Central Kakaako							1,428		WAREHOUSE	0	0	0	0	0	132		132
	24	21049045 Central Kakaako					30,000				OFFICES	0	0	0	2070	0	0		2070
	24	21049045 Central Kakaako							182,450		WAREHOUSE	0	0	0	0	0	16786		16786
	24	21049046 Central Kakaako							1,600		WAREHOUSE	0	0	0	0	0	148		148
	24	21049049 Central Kakaako							1,050		WAREHOUSE	0	0	0	0	0	97		97
803 Waimanu	24	21049050 Central Kakaako			153						APARTMENT	0	61200	0	0	0	0		61200
	24	21049054 Central Kakaako						975			MEZZ DISPLAY SALES	0	0	0	0	68	0		68
	24	21049054 Central Kakaako					1,364				OFF ENCL WAREHSE	0	0	0	95	0	0		95
	24	21049054 Central Kakaako							5,353		WAREHOUSE	0	0	0	0	0	493		493
	25	21049055 Central Kakaako						1,620			RETAIL STORE	0	0	0	0	112	0		112
	25	21049055 Central Kakaako							2,250		WAREHOUSE	0	0	0	0	0	207		207
	25	21049056 Central Kakaako		1							SF HOME	500	0	0	0	0	0		500

	Land Use: Existing Condition										Water							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Commercial	General / Light Industry	Other	Average Day Flow
												500	400	350	69	69	92		
				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	ga/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
	25	21049057 Central Kakaako		1							SF HOME	500	0	0	0	0	0		500
	25	21049058 Central Kakaako							4,275		WAREHOUSE	0	0	0	0	0	394		394
	25	21049060 Central Kakaako						1,008			RETAIL STORE	0	0	0	0	70	0		70
	25	21049060 Central Kakaako							2,400		WAREHOUSE	0	0	0	0	0	221		221
	25	21049061 Central Kakaako							3,800		WAREHOUSE	0	0	0	0	0	350		350
	19	21049063 Kapiolani					5,207				OFFICES	0	0	0	360	0	0		360
	19	21049063 Kapiolani								5,239	RESTAURANT	0	0	0	0	0	0	362 Commercial	362
	19	21049064 Kapiolani					3,022				OFFICES	0	0	0	209	0	0		209
	19	21049064 Kapiolani								3,478	RESTAURANT	0	0	0	0	0	0	240 Commercial	240
	19	21049066 Kapiolani						53,124			AUTO SHOWROOM/OFFICE	0	0	0	0	3666	0		3666
	19	21049066 Kapiolani						1,034			MEZZ DISPLAY SALES	0	0	0	0	72	0		72
	25	21049069 Central Kakaako						2,805			RETAIL STORE	0	0	0	0	194	0		194
	24	21049070 Central Kakaako					160				OFF ENCL WAREHSE	0	0	0	12	0	0		12
	24	21049071 Central Kakaako							1,830		WAREHOUSE	0	0	0	0	0	169		169
	24	21049073 Central Kakaako							7,580		WAREHOUSE	0	0	0	0	0	698		698
	19	21049075 Kapiolani						665			MEZZ DISPLAY SALES	0	0	0	0	46	0		46
	19	21049075 Kapiolani					1,501				OFFICES	0	0	0	104	0	0		104
	19	21049075 Kapiolani							5,267		WAREHOUSE	0	0	0	0	0	485		485
	24	21049076 Central Kakaako					1,026				OFFICES	0	0	0	71	0	0		71
	24	21049076 Central Kakaako							6,030		WAREHOUSE	0	0	0	0	0	555		555
	27	21049078 Central Kakaako							14,500		AUTO PARTS/SERVICE	0	0	0	0	0	1334		1334
	26	21049079 Central Kakaako							3,564		WAREHOUSE	0	0	0	0	0	328		328
	19	21049080 Kapiolani								3,129	RESTAURANT	0	0	0	0	0	0	216 Commercial	216
	HH 5	21050001 Pauahi							9,600		WAREHOUSE	0	0	0	0	0	884		884
	30R	21050002 Central Kakaako					3,050				OFFICES	0	0	0	211	0	0		211
	30R	21050003 Central Kakaako					3,500				OFF ENCL WAREHSE	0	0	0	242	0	0		242
	30R	21050003 Central Kakaako							20,500		WAREHOUSE	0	0	0	0	0	1886		1886
	30R	21050004 Central Kakaako					6,202				OFF ENCL WAREHSE	0	0	0	428	0	0		428
	30R	21050004 Central Kakaako						3,082			RETAIL STORE	0	0	0	0	213	0		213
	30R	21050004 Central Kakaako							12,241		WAREHOUSE	0	0	0	0	0	1127		1127
	30R	21050007 Central Kakaako					7,030				OFFICES	0	0	0	486	0	0		486
	30R	21050007 Central Kakaako							4,029		WAREHOUSE	0	0	0	0	0	371		371
	30R	21050009 Central Kakaako					1,225				OFFICES	0	0	0	85	0	0		85
	30R	21050011 Central Kakaako					1,200				OFFICES	0	0	0	83	0	0		83
	30R	21050011 Central Kakaako							14,550		WAREHOUSE	0	0	0	0	0	1339		1339
	30R	21050012 Central Kakaako					1,488				OFFICES	0	0	0	103	0	0		103
	30R	21050012 Central Kakaako									PARKING PAR/ENCL	0	0	0	0	0	0		0
	28	21050016 Central Kakaako							6,816		WAREHOUSE	0	0	0	0	0	628		628
	28	21050017 Central Kakaako							5,150		WAREHOUSE	0	0	0	0	0	474		474
	28	21050018 Central Kakaako					6,300				OFFICES	0	0	0	435	0	0		435
	28	21050019 Central Kakaako							2,436		AUTO PARTS/SERVICE	0	0	0	0	0	225		225
	28	21050020 Central Kakaako							2,772		AUTO PARTS/SERVICE	0	0	0	0	0	256		256
	28	21050021 Central Kakaako							1,609		WAREHOUSE	0	0	0	0	0	149		149
	28	21050022 Central Kakaako							2,500		AUTO PARTS/SERVICE	0	0	0	0	0	230		230
	28	21050023 Central Kakaako							5,000		AUTO PARTS/SERVICE	0	0	0	0	0	460		460
	28	21050024 Central Kakaako					320				OFFICES	0	0	0	23	0	0		23
	28	21050027 Central Kakaako						720			MEZZ DISPLAY SALES	0	0	0	0	50	0		50
	28	21050027 Central Kakaako							2,850		WAREHOUSE	0	0	0	0	0	263		263
	28	21050028 Central Kakaako						1,388			MEZZ DISPLAY SALES	0	0	0	0	96	0		96
	28	21050028 Central Kakaako					1,388				OFFICES	0	0	0	96	0	0		96
	28	21050028 Central Kakaako							8,200		WAREHOUSE	0	0	0	0	0	755		755
	28	21050030 Central Kakaako							9,750		LIGHT MANUFACTURING	0	0	0	0	0	897		897
	28	21050030 Central Kakaako							8,000		WAREHOUSE	0	0	0	0	0	736		736
	28	21050031 Central Kakaako						1,207			RETAIL STORE	0	0	0	0	84	0		84
	28	21050031 Central Kakaako							2,289		WAREHOUSE	0	0	0	0	0	211		211
	28	21050032 Central Kakaako						4,319			RETAIL STORE	0	0	0	0	299	0		299
	28	21050033 Central Kakaako					240				MEZZ ENCL OFFICE	0	0	0	17	0	0		17
	28	21050033 Central Kakaako							2,104		WAREHOUSE	0	0	0	0	0	194		194
	28	21050034 Central Kakaako								2,116	VETENARIAN	0	0	0	0	0	0	147 Office	147
	28	21050034 Central Kakaako							4,644		WAREHOUSE	0	0	0	0	0	428		428
	28	21050035 Central Kakaako							6,000		WAREHOUSE	0	0	0	0	0	552		552
	28	21050036 Central Kakaako					557				OFFICES	0	0	0	39	0	0		39
	28	21050036 Central Kakaako							6,422		WAREHOUSE	0	0	0	0	0	591		591
	28	21050037 Central Kakaako			1						APARTMENT	0	400	0	0	0	0		400
	28	21050037 Central Kakaako					760				OFFICES	0	0	0	53	0	0		53
	28	21050038 Central Kakaako					440				MEZZ ENCL OFFICE	0	0	0	31	0	0		31
	28	21050039 Central Kakaako							3,772		WAREHOUSE	0	0	0	0	0	348		348
	28	21050042 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	28	21050042 Central Kakaako							7,300		WAREHOUSE	0	0	0	0	0	672		672
	29	21050043 Central Kakaako					905				MEZZ ENCL OFFICE	0	0	0	63	0	0		63
	29	21050043 Central Kakaako							3,761		WAREHOUSE	0	0	0	0	0	347		347
	29	21050045 Central Kakaako							2,576		AUTO PARTS/SERVICE	0	0	0	0	0	237		237
	29	21050046 Central Kakaako							2,972		AUTO PARTS/SERVICE	0	0	0	0	0	274		274
	29	21050048 Central Kakaako					1,600				MEZZ ENCL OFFICE	0	0	0	111	0	0		111
	29	21050048 Central Kakaako							4,050		WAREHOUSE	0	0	0	0	0	373		373
	29	21050049 Central Kakaako			2						APARTMENT	0	800	0	0	0	0		800
	29	21050052 Central Kakaako					3,096				BANK/SAVINGS INST	0	0	0	214	0	0		214
	29	21050052 Central Kakaako					6,943				MEZZ ENCL OFFICE	0	0	0	480	0	0		480
	28	21050054 Central Kakaako						7,150			RETAIL STORE	0	0	0	0	494	0		494
	28	21050055 Central Kakaako							2,000		WAREHOUSE	0	0	0	0	0	184		184

	Land Use: Existing Condition										Water							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Commercial	General / Light Industry	Other	Average Day Flow
												500	400	350	69	69	92		
				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	ga/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
	29	21050056 Central Kakaako							2,075		AUTO PARTS/SERVICE	0	0	0	0	0	191		191
	28	21050057 Central Kakaako							3,000		WAREHOUSE	0	0	0	0	0	276		276
	30R	21050058 Central Kakaako							5,677		LIGHT MANUFACTURING	0	0	0	0	0	523		523
	28	21050059 Central Kakaako							2,900		LIGHT MANUFACTURING	0	0	0	0	0	267		267
	28	21050060 Central Kakaako							960		WAREHOUSE	0	0	0	0	0	89		89
	HH 5	21050061 Pauahi						12,800			RETAIL STORE	0	0	0	0	884	0		884
	HH 5	21050061 Pauahi							15,429		WAREHOUSE	0	0	0	0	0	1420		1420
	HH 5	21050062 Pauahi								4,808	RESTAURANT	0	0	0	0	0	0	332 Commercial	332
	HH 5	21050062 Pauahi							4,808		WAREHOUSE	0	0	0	0	0	443		443
KAUHALE Kaka'ako	30R	21050070 Central Kakaako			269						APARTMENT	0	107600	0	0	0	0		107600
KAUHALE Kaka'ako	30R	21050070 Central Kakaako								7,108	SCHOOL	0	0	0	0	0	0	5340 60 gal/student	5340
KAUHALE Kaka'ako	30R	21050070 Central Kakaako					3,763				OFFICES	0	0	0	260	0	0		260
KAUHALE Kaka'ako	30R	21050070 Central Kakaako						220			CONVENIENCE STORE	0	0	0	0	16	0		16
KAUHALE Kaka'ako	30R	21050070 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	44	21051001 Pauahi					9,128				MEZZ ENCL OFFICE	0	0	0	630	0	0		630
	44	21051002 Pauahi							10,775		AUTO PARTS/SERVICE	0	0	0	0	0	992		992
	44	21051002 Pauahi					16,000				OFFICES	0	0	0	1104	0	0		1104
	44	21051002 Pauahi							15,916		WAREHOUSE	0	0	0	0	0	1465		1465
	43	21051007 Pauahi					18,028				OFFICES	0	0	0	1244	0	0		1244
	43	21051010 Pauahi							7,589		WAREHOUSE	0	0	0	0	0	699		699
	43	21051011 Pauahi							17,000		WAREHOUSE	0	0	0	0	0	1564		1564
	43	21051012 Pauahi					1,480				OFFICES	0	0	0	103	0	0		103
	43	21051012 Pauahi							29,687		WAREHOUSE	0	0	0	0	0	2732		2732
POHULANI	43	21051013 Pauahi			262						APARTMENT	0	104800	0	0	0	0		104800
	43	21051018 Pauahi					2,592				MEZZ ENCL OFFICE	0	0	0	179	0	0		179
	43	21051018 Pauahi							6,570		WAREHOUSE	0	0	0	0	0	605		605
	43	21051031 Pauahi					3,259				OFF ENCL WAREHSE	0	0	0	225	0	0		225
	43	21051033 Pauahi			3						APARTMENT	0	1200	0	0	0	0		1200
	43	21051033 Pauahi					47,715				OFFICES	0	0	0	3293	0	0		3293
	43	21051033 Pauahi								16,470	RACQUET BALL COURT	0	0	0	0	0	0	1137 Commercial	1137
NĀ LE HULU KŪPUNA	44	21051038 Pauahi			76						APARTMENT	0	30400	0	0	0	0		30400
NĀ LE HULU KŪPUNA	44	21051038 Pauahi					1,995				OFFICES	0	0	0	138	0	0		138
LIBRARY WAREHOUSE /	46	21051041 Pauahi							18,000		WAREHOUSE	0	0	0	0	0	1656		1656
Halekauwila Place	46	21051042 Pauahi			203						APARTMENT	0	81200	0	0	0	0		81200
	48N (not HH)	21052001 Pauahi					4,340				MEZZ ENCL OFFICE	0	0	0	300	0	0		300
	48N (not HH)	21052001 Pauahi							23,334		WAREHOUSE	0	0	0	0	0	2147		2147
	48N (not HH)	21052002 Pauahi					405				OFF ENCL WAREHSE	0	0	0	28	0	0		28
	48N (not HH)	21052002 Pauahi							3,080		WAREHOUSE	0	0	0	0	0	284		284
	48N (not HH)	21052003 Pauahi					312				MEZZ ENCL OFFICE	0	0	0	22	0	0		22
	48N (not HH)	21052003 Pauahi							1,968		WAREHOUSE	0	0	0	0	0	182		182
	48N (not HH)	21052005 Pauahi							6,320		WAREHOUSE	0	0	0	0	0	582		582
	48N (not HH)	21052007 Pauahi					280				OFF ENCL WAREHSE	0	0	0	20	0	0		20
	48N (not HH)	21052007 Pauahi							6,222		WAREHOUSE	0	0	0	0	0	573		573
	48N (not HH)	21052008 Pauahi					16,800				OFFICES	0	0	0	1160	0	0		1160
	HH 5	21052010 Pauahi					4,992				OFFICES	0	0	0	345	0	0		345
	HH 5	21052011 Pauahi							8,452		MINI-WAREHOUSE	0	0	0	0	0	778		778
	HH 5	21052012 Pauahi					1,618				OFFICES	0	0	0	112	0	0		112
	HH 5	21052012 Pauahi							32,998		WAREHOUSE	0	0	0	0	0	3036		3036
	48N (not HH)	21052013 Pauahi							11,978		WAREHOUSE	0	0	0	0	0	1102		1102
	HH 5	21052017 Pauahi					3,530				MEZZ ENCL OFFICE	0	0	0	244	0	0		244
	HH 5	21052017 Pauahi							4,340		WAREHOUSE	0	0	0	0	0	400		400
	HH 5	21052020 Pauahi					16,936				OFFICES	0	0	0	1169	0	0		1169
	HH 5	21052020 Pauahi						15,668			RETAIL STORE	0	0	0	0	1082	0		1082
	HH 5	21052024 Pauahi					10,403				OFFICES	0	0	0	718	0	0		718
	HH 5	21052027 Pauahi					4,936				OFFICES	0	0	0	341	0	0		341
	HH 5	21052027 Pauahi								4,936	RESTAURANT	0	0	0	0	0	0	341 Commercial	341
	HH 5	21052028 Pauahi					8,571				OFFICES	0	0	0	592	0	0		592
	HH 5	21052028 Pauahi							3,380		WAREHOUSE	0	0	0	0	0	311		311
	HH 5	21052031 Pauahi					2,800				MEZZ ENCL OFFICE	0	0	0	194	0	0		194
	HH 5	21052031 Pauahi							2,800		WAREHOUSE	0	0	0	0	0	258		258
	HH 5	21052032 Pauahi					10,000				OFFICES	0	0	0	690	0	0		690
	HH 5	21052033 Pauahi					3,240				OFF ENCL WAREHSE	0	0	0	224	0	0		224
	HH 5	21052034 Pauahi					740				MEZZ ENCL OFFICE	0	0	0	52	0	0		52
	HH 5	21052034 Pauahi							3,050		WAREHOUSE	0	0	0	0	0	281		281
	HH 5	21052035 Pauahi					4,300				OFFICES	0	0	0	297	0	0		297
	HH 5	21052036 Pauahi					10,320				OFFICES	0	0	0	713	0	0		713
	HH 5	21052038 Pauahi					4,000				OFF ENCL WAREHSE	0	0	0	276	0	0		276
	HH 5	21052039 Pauahi					680				OFFICES	0	0	0	47	0	0		47
	HH 5	21052039 Pauahi							8,000		WAREHOUSE	0	0	0	0	0	736		736
	HH 5	21052040 Pauahi							4,000		WAREHOUSE	0	0	0	0	0	368		368
	HH 5	21052042 Pauahi					4,640				MEZZ ENCL OFFICE	0	0	0	321	0	0		321
	HH 5	21052042 Pauahi					12,600				OFF ENCL WAREHSE	0	0	0	870	0	0		870
	HH 5	21052043 Pauahi					2,214				MEZZ ENCL OFFICE	0	0	0	153	0	0		153
	HH 5	21052043 Pauahi							12,600		WAREHOUSE	0	0	0	0	0	1160		1160
	HH 5	21052045 Pauahi						3,050			RETAIL STORE	0	0	0	0	211	0		211
	HH 5	21052046 Pauahi							9,271		WAREHOUSE	0	0	0	0	0	853		853
	HH 5	21052051 Pauahi					510				OFF ENCL WAREHSE	0	0	0	36	0	0		36
	HH 5	21052051 Pauahi							3,000		WAREHOUSE	0	0	0	0	0	276		276
	HH 5	21052052 Pauahi					720				OFFICES	0	0	0	50	0	0		50
	HH 5	21052052 Pauahi							2,700		WAREHOUSE	0	0	0	0	0	249		249

				Land Use: Existing Condition								Water							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Commercial	General / Light Industry	Other	Average Day Flow
												500	400	350	69	69	92		
				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
	HH 5	21052053 Pauahi							4,440		WAREHOUSE	0	0	0	0	0	409		409
	HH 5	21052054 Pauahi		1							SF HOME	500	0	0	0	0	0		500
	HH 5	21053001 Pauahi							50,880		WAREHOUSE	0	0	0	0	0	4681		4681
	HH 5	21053030 Pauahi						17,273			RETAIL STORE	0	0	0	0	1192	0		1192
	HH 5	21053030 Pauahi					14,096				OFFICES	0	0	0	973	0	0		973
	55 (KS D)	21053032 Pauahi							109,011		WAREHOUSE	0	0	0	0	0	10030		10030
	55 (KS D)	21053032 Pauahi						20,000			MEZZ DISPLAY SALES	0	0	0	0	1380	0		1380
	55 (KS D)	21053032 Pauahi								4,784	BAR LOUNGE	0	0	0	0	0	0	331 Commercial	331
	55 (KS D)	21053032 Pauahi					3,275				MEZZ ENCL OFFICE	0	0	0	226	0	0		226
	53	21054021 Pauahi							80,321		WAREHOUSE	0	0	0	0	0	7390		7390
	53	21054021 Pauahi					4,403				OFF ENCL WAREHSE	0	0	0	304	0	0		304
	53	21054021 Pauahi						40,941			RETAIL STORE	0	0	0	0	2825	0		2825
	53	21054021 Pauahi					11,150				OFFICES	0	0	0	770	0	0		770
ONE WATERFRONT TOWERS	52X	21054022 Pauahi					49,891				OFFICES	0	0	0	3443	0	0		3443
ONE WATERFRONT TOWERS	52X	21054022 Pauahi			306						APARTMENT	0	122400	0	0	0	0		122400
	52 (KS B)	21054025 Pauahi							40,728		WAREHOUSE	0	0	0	0	0	3747		3747
	52 (KS B)	21054025 Pauahi					9,940				OFF ENCL WAREHSE	0	0	0	686	0	0		686
	52 (KS B)	21054025 Pauahi						18,373			RETAIL STORE	0	0	0	0	1268	0		1268
	52 (KS B)	21054027 Pauahi								17,000	SCHOOL	0	0	0	0	0	0	12780 60 gal/student	12780
	52 (KS B)	21054027 Pauahi					3,000				MEZZ ENCL OFFICE	0	0	0	207	0	0		207
	52 (KS B)	21054028 Pauahi							24,600		WAREHOUSE	0	0	0	0	0	2264		2264
	52 (KS B)	21054028 Pauahi					1,300				OFF ENCL WAREHSE	0	0	0	90	0	0		90
	54 (KS C)	21054036 Pauahi							55,926		WAREHOUSE	0	0	0	0	0	5146		5146
	59	21055001 Pauahi						5,054			RETAIL STORE	0	0	0	0	349	0		349
	59	21055002 Pauahi					9,861				AUTO SHOWROOM/OFFICE	0	0	0	681	0	0		681
	59	21055002 Pauahi							2,565		AUTO PARTS/SERVICE	0	0	0	0	0	236		236
	58	21055003 Pauahi						5,480			RETAIL STORE	0	0	0	0	379	0		379
	58	21055003 Pauahi							8,760		WAREHOUSE	0	0	0	0	0	806		806
	58	21055003 Pauahi					5,480				MEZZ ENCL OFFICE	0	0	0	379	0	0		379
THE COLLECTION	57	21055004 Pauahi			467			12,987			APARTMENT/COMMERCIAL	0	186800	0	0	897	0		187697
	58	21055006 Pauahi							6,970		WAREHOUSE	0	0	0	0	0	642		642
	58	21055006 Pauahi					7,200				OFFICES	0	0	0	497	0	0		497
	58	21055021 Pauahi					22,128				OFFICES	0	0	0	1527	0	0		1527
	58	21055026 Pauahi						2,420			RETAIL STORE	0	0	0	0	167	0		167
	59	21055032 Pauahi							4,800		WAREHOUSE	0	0	0	0	0	442		442
	59	21055032 Pauahi					200				OFFICES	0	0	0	14	0	0		14
	59	21055033 Pauahi							7,260		WAREHOUSE	0	0	0	0	0	668		668
	59	21055034 Pauahi						4,961			RETAIL STORE	0	0	0	0	343	0		343
	59	21055035 Pauahi							5,360		WAREHOUSE	0	0	0	0	0	494		494
	58	21055038 Pauahi					10,644				OFFICES	0	0	0	735	0	0		735
	58	21055038 Pauahi							20,366		WAREHOUSE	0	0	0	0	0	1874		1874
	58	21055038 Pauahi					1,925				MEZZ ENCL OFFICE	0	0	0	133	0	0		133
	HH 5	21056001 Pauahi					34,376				OFFICES	0	0	0	2372	0	0		2372
	HH 5	21056001 Pauahi					7,136				BANK/SAVINGS INST	0	0	0	493	0	0		493
	61	21056002 Pauahi					5,256				OFFICES	0	0	0	363	0	0		363
	61	21056002 Pauahi							12,382		WAREHOUSE	0	0	0	0	0	1140		1140
	60	21056003 Pauahi						24,000			RETAIL STORE	0	0	0	0	1656	0		1656
	60	21056004 Pauahi							5,324		WAREHOUSE	0	0	0	0	0	490		490
	60	21056004 Pauahi					1,217				OFF ENCL WAREHSE	0	0	0	84	0	0		84
	60	21056004 Pauahi						12,200			AUTO SHOWROOM/OFFICE	0	0	0	0	842	0		842
	60	21056004 Pauahi							12,870		AUTO PARTS/SERVICE	0	0	0	0	0	1185		1185
	61	21056007 Pauahi					20,812				OFFICES	0	0	0	1437	0	0		1437
	61	21056008 Pauahi					1,654				OFFICES	0	0	0	115	0	0		115
	61	21056008 Pauahi							16,037		AUTO PARTS/SERVICE	0	0	0	0	0	1476		1476
	64 (HH 2)	23001005 Auahi						2,970			MEZZ DISPLAY SALES	0	0	0	0	205	0		205
	64 (HH 2)	23001005 Auahi					3,717				MEZZ ENCL OFFICE	0	0	0	257	0	0		257
	64 (HH 2)	23001005 Auahi									PARK STRUCTURE	0	0	0	0	0	0		0
	64 (HH 2)	23001005 Auahi								1,761	RESTAURANT	0	0	0	0	0	0	122 Commercial	122
	64 (HH 2)	23001005 Auahi						110,307			RETAIL STORE	0	0	0	0	7612	0		7612
	62 (HH 1)	23002001 Auahi						81,945			RETAIL STORE	0	0	0	0	5655	0		5655
	62 (HH 1)	23002001 Auahi							80,840		WAREHOUSE	0	0	0	0	0	7438		7438
	62 (HH 1)	23002002 Auahi								7,481	RESTAURANT	0	0	0	0	0	0	517 Commercial	517
	62 (HH 1)	23002057 Auahi						23,567			RETAIL STORE	0	0	0	0	1627	0		1627
	62 (HH 1)	23002058 Auahi					1,404				OFF ENCL WAREHSE	0	0	0	97	0	0		97
	62 (HH 1)	23002058 Auahi							5,594		WAREHOUSE	0	0	0	0	0	515		515
	62 (HH 1)	23002059 Auahi					64,561				DEPARTMENT STORE	0	0	0	4455	0	0		4455
	62 (HH 1)	23002059 Auahi							17,435		WAREHOUSE	0	0	0	0	0	1605		1605
	62 (HH 1)	23002066 Auahi							2,458		WAREHOUSE	0	0	0	0	0	227		227
	62 (HH 1)	23002069 Auahi							4,000		WAREHOUSE	0	0	0	0	0	368		368
	62 (HH 1)	23002104 Auahi									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	62 (HH 1)	23002104 Auahi								86,676	CINEMA	0	0	0	0	0	0	5981 Commercial	5981
1	62 (HH 1)	23002104 Auahi								38,700	RESTAURANT	0	0	0	0	0	0	2671 Commercial	2671
	62 (HH 1)	23002104 Auahi						27,066			RETAIL STORE	0	0	0	0	1868	0		1868
	34	23003004 Central Kakaako						2,900			MEZZ DISPLAY SALES	0	0	0	0	201	0		201
	34	23003004 Central Kakaako					2,900				OFFICES	0	0	0	201	0	0		201
	34	23003005 Central Kakaako					3,249				OFFICES	0	0	0	225	0	0		225
	34	23003005 Central Kakaako							1,000		WAREHOUSE	0	0	0	0	0	92		92
	34	23003006 Central Kakaako							2,790		WAREHOUSE	0	0	0	0	0	257		257

				Land Use: Existing Condition								Water							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Commercial	General / Light Industry	Other	Average Day Flow
												500	400	350	69	69	92		
				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
	34	23003007 Central Kakaako			2						APARTMENT	0	800	0	0	0	0		800
	34	23003008 Central Kakaako					21,888				MINI-WAREHOUSE	0	0	0	1511	0	0		1511
	34	23003008 Central Kakaako					2,786				OFF ENCL WAREHSE	0	0	0	193	0	0		193
	34	23003008 Central Kakaako							21,207		WAREHOUSE	0	0	0	0	0	1952		1952
	34	23003011 Central Kakaako					1,732				OFF ENCL WAREHSE	0	0	0	120	0	0		120
	34	23003011 Central Kakaako								3,000	RACQUET BALL COURT	0	0	0	0	0	0	207 Commercial	207
	34	23003012 Central Kakaako							2,784		WAREHOUSE	0	0	0	0	0	257		257
	34	23003013 Central Kakaako					3,000				OFFICES	0	0	0	207	0	0		207
	34	23003014 Central Kakaako										0	0	0	0	0	0		0
	34	23003015 Central Kakaako					15,000				OFFICES	0	0	0	1035	0	0		1035
KAMAKEE VISTA	34	23003018 Central Kakaako			226						APARTMENT	0	90400	0	0	0	0		90400
KAMAKEE VISTA	34	23003018 Central Kakaako					736				MEZZ ENCL OFFICE	0	0	0	51	0	0		51
KAMAKEE VISTA	34	23003018 Central Kakaako					15,285				OFFICES	0	0	0	1055	0	0		1055
KAMAKEE VISTA	34	23003018 Central Kakaako									PARKING PAR/ENCL	0	0	0	0	0	0		0
KAMAKEE VISTA	34	23003018 Central Kakaako								9,059	SCHOOL	0	0	0	0	0	0	6840 60 gal/student	6840
	32	23003019 Central Kakaako							1,792		WAREHOUSE	0	0	0	0	0	165		165
	32	23003020 Central Kakaako					969				MEZZ ENCL OFFICE	0	0	0	67	0	0		67
	32	23003020 Central Kakaako							9,969		WAREHOUSE	0	0	0	0	0	918		918
	32	23003021 Central Kakaako							3,500		WAREHOUSE	0	0	0	0	0	322		322
	32	23003022 Central Kakaako						2,472			MEZZ DISPLAY SALES	0	0	0	0	171	0		171
	32	23003022 Central Kakaako					948				MEZZ ENCL OFFICE	0	0	0	66	0	0		66
	32	23003022 Central Kakaako					556				OFF ENCL WAREHSE	0	0	0	39	0	0		39
	32	23003022 Central Kakaako							7,120		WAREHOUSE	0	0	0	0	0	656		656
	32	23003023 Central Kakaako							8,455		WAREHOUSE	0	0	0	0	0	778		778
	32	23003024 Central Kakaako					6,493				OFFICES	0	0	0	449	0	0		449
	32	23003024 Central Kakaako						5,513			RETAIL STORE	0	0	0	0	381	0		381
	32	23003026 Central Kakaako							4,018		LIGHT MANUFACTURING	0	0	0	0	0	370		370
	32	23003026 Central Kakaako					690				MEZZ ENCL OFFICE	0	0	0	48	0	0		48
	32	23003026 Central Kakaako								1,890	RESTAURANT	0	0	0	0	0	0	131 Commercial	131
	32	23003028 Central Kakaako							2,940		WAREHOUSE	0	0	0	0	0	271		271
	32	23003030 Central Kakaako		1							SF HOME	500	0	0	0	0	0		500
	32	23003031 Central Kakaako					312				MEZZ ENCL OFFICE	0	0	0	22	0	0		22
	32	23003031 Central Kakaako					572				OFFICES	0	0	0	40	0	0		40
	32	23003031 Central Kakaako							1,628		WAREHOUSE	0	0	0	0	0	150		150
	32	23003032 Central Kakaako			1						APARTMENT	0	400	0	0	0	0		400
	32	23003032 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	32	23003032 Central Kakaako					2,526				OFFICES	0	0	0	175	0	0		175
	33	23003037 Central Kakaako							8,550		WAREHOUSE	0	0	0	0	0	787		787
	33	23003038 Central Kakaako					2,800				MEZZ ENCL OFFICE	0	0	0	194	0	0		194
	33	23003038 Central Kakaako					2,800				OFF ENCL WAREHSE	0	0	0	194	0	0		194
	33	23003038 Central Kakaako							13,680		WAREHOUSE	0	0	0	0	0	1259		1259
	33	23003043 Central Kakaako					24,064				OFFICES	0	0	0	1661	0	0		1661
	33	23003046 Central Kakaako							4,414		WAREHOUSE	0	0	0	0	0	407		407
	33	23003047 Central Kakaako							3,000		WAREHOUSE	0	0	0	0	0	276		276
	33	23003048 Central Kakaako							3,800		WAREHOUSE	0	0	0	0	0	350		350
	33	23003049 Central Kakaako					3,936				OFFICES	0	0	0	272	0	0		272
	33	23003049 Central Kakaako						3,936			RETAIL STORE	0	0	0	0	272	0		272
	33	23003059 Central Kakaako							27,158		WAREHOUSE	0	0	0	0	0	2499		2499
	31	23003061 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	31	23003061 Central Kakaako					4,199				OFFICES	0	0	0	290	0	0		290
	31	23003061 Central Kakaako								1,409	RESTAURANT	0	0	0	0	0	0	98 Commercial	98
	31	23003062 Central Kakaako									BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	31	23003062 Central Kakaako							7,500		WAREHOUSE	0	0	0	0	0	690		690
	31	23003063 Central Kakaako					480				OFF ENCL WAREHSE	0	0	0	34	0	0		34
	31	23003063 Central Kakaako							1,920		WAREHOUSE	0	0	0	0	0	177		177
	31	23003064 Central Kakaako							10,000		WAREHOUSE	0	0	0	0	0	920		920
	31	23003065 Central Kakaako					1,446				OFFICES	0	0	0	100	0	0		100
	31	23003065 Central Kakaako							2,644		WAREHOUSE	0	0	0	0	0	244		244
	31	23003066 Central Kakaako							6,500		WAREHOUSE	0	0	0	0	0	598		598
	31	23003067 Central Kakaako					7,530				MEZZ ENCL OFFICE	0	0	0	520	0	0		520
	31	23003067 Central Kakaako					2,244				OFF ENCL WAREHSE	0	0	0	155	0	0		155
	31	23003067 Central Kakaako							12,504		WAREHOUSE	0	0	0	0	0	1151		1151
	31	23003068 Central Kakaako					1,600				OFF ENCL WAREHSE	0	0	0	111	0	0		111
	31	23003068 Central Kakaako							3,680		WAREHOUSE	0	0	0	0	0	339		339
	31	23003069 Central Kakaako					1,520				MEZZ ENCL OFFICE	0	0	0	105	0	0		105
	31	23003069 Central Kakaako							3,560		WAREHOUSE	0	0	0	0	0	328		328
	20	23003071 Kapiolani					1,287				MEZZ ENCL OFFICE	0	0	0	89	0	0		89
	20	23003071 Kapiolani					2,803				MEZZ ENCL OFFICE	0	0	0	194	0	0		194
	20	23003071 Kapiolani							7,127		WAREHOUSE	0	0	0	0	0	656		656
909 Kapiolani	20	23003073 Kapiolani			228						APARTMENT	0	91200	0	0	0	0		91200
909 Kapiolani	20	23003073 Kapiolani					3,923				OFFICES	0	0	0	271	0	0		271
909 Kapiolani	20	23003073 Kapiolani							4,838		WAREHOUSE	0	0	0	0	0	446		446
	20	23003074 Kapiolani							1,680		AUTO PARTS/SERVICE	0	0	0	0	0	155		155
	20	23003074 Kapiolani					1,000				OFFICES	0	0	0	69	0	0		69
	20	23003075 Kapiolani					16,990				MINI-WAREHOUSE	0	0	0	1173	0	0		1173
	31	23003078 Central Kakaako					2,684				OFF ENCL WAREHSE	0	0	0	186	0	0		186
	31	23003078 Central Kakaako							9,200		WAREHOUSE	0	0	0	0	0	847		847
	32	23003081 Central Kakaako					2,016				OFFICES	0	0	0	140	0	0		140
	32	23003083 Central Kakaako					720				OFF ENCL WAREHSE	0	0	0	50	0	0		50
	32	23003083 Central Kakaako							2,240		WAREHOUSE	0	0	0	0	0	207		207

	Land Use: Existing Condition											Water							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Commercial	General / Light Industry	Other	Average Day Flow
												500	400	350	69	69	92		
				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
	31	23003090	Central Kakaako				1,250				OFFICES	0	0	0	87	0	0		87
	31	23003091	Central Kakaako							7,500	RESTAURANT	0	0	0	0	0	0	518 Commercial	518
	31	23003092	Central Kakaako						3,650		WAREHOUSE	0	0	0	0	0	336		336
	31	23003093	Central Kakaako				835				MEZZ ENCL OFFICE	0	0	0	58	0	0		58
	31	23003093	Central Kakaako						6,880		WAREHOUSE	0	0	0	0	0	633		633
	32	23003094	Central Kakaako				942				OFFICES	0	0	0	65	0	0		65
	32	23003094	Central Kakaako						2,880		WAREHOUSE	0	0	0	0	0	265		265
	32	23003095	Central Kakaako						1,035		WAREHOUSE	0	0	0	0	0	96		96
	20	23003097	Kapiolani				12,228				OFFICES	0	0	0	844	0	0		844
	20	23003098	Kapiolani				13,824				OFFICES	0	0	0	954	0	0		954
	20	23003099	Kapiolani				1,911				BANK/SAVINGS INST	0	0	0	132	0	0		132
	20	23003099	Kapiolani				1,620				OFFICES	0	0	0	112	0	0		112
PACIFICA HONOLULU	20	23003105	Kapiolani		489						APARTMENT	0	195600	0	0	0	0		195600
PACIFICA HONOLULU	20	23003105	Kapiolani					9,985			RETAIL STORE	0	0	0	0	689	0		689
	21	23004002	Kapiolani				7,210				OFFICES	0	0	0	498	0	0		498
	21	23004003	Kapiolani				15,388				OFFICES	0	0	0	1062	0	0		1062
	21	23004003	Kapiolani					3,721			RETAIL STORE	0	0	0	0	257	0		257
	21	23004007	Kapiolani							4,257	RESTAURANT	0	0	0	0	0	0	294 Commercial	294
	21	23004007	Kapiolani					4,257			RETAIL STORE	0	0	0	0	294	0		294
	21	23004010	Kapiolani							1,888	CAR WASH AUTOMATIC	0	0	0	0	0	0	131 Commercial	131
	21	23004010	Kapiolani						1,946		SERVICE STATION W/BAYS	0	0	0	0	0	180		180
	21	23004012	Kapiolani						8,792		WAREHOUSE	0	0	0	0	0	809		809
1133 WAIMANU	35	23004025	Central Kakaako		282						APARTMENT	0	112800	0	0	0	0		112800
	35	23004029	Central Kakaako								BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	35	23004029	Central Kakaako				6,561				OFFICES	0	0	0	453	0	0		453
	35	23004031	Central Kakaako				576				OFFICES	0	0	0	40	0	0		40
	35	23004033	Central Kakaako								BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	35	23004033	Central Kakaako				2,960				MEZZ ENCL OFFICE	0	0	0	205	0	0		205
	35	23004033	Central Kakaako				2,960				OFFICES	0	0	0	205	0	0		205
	35	23004033	Central Kakaako						7,790		WAREHOUSE	0	0	0	0	0	717		717
	35	23004034	Central Kakaako							1,994	RESTAURANT	0	0	0	0	0	0	138 Commercial	138
	36	23004035	Central Kakaako				5,839				OFF ENCL WAREHSE	0	0	0	403	0	0		403
	36	23004035	Central Kakaako				7,274				OFFICES	0	0	0	502	0	0		502
	36	23004035	Central Kakaako						38,790		WAREHOUSE	0	0	0	0	0	3569		3569
	21	23004037	Kapiolani				160				OFFICES	0	0	0	12	0	0		12
	21	23004039	Kapiolani						1,248		AUTO PARTS/SERVICE	0	0	0	0	0	115		115
	36	23004048	Central Kakaako				2,130				OFF ENCL WAREHSE	0	0	0	147	0	0		147
	36	23004048	Central Kakaako						6,493		WAREHOUSE	0	0	0	0	0	598		598
	36	23004051	Central Kakaako				1,830				OFFICES	0	0	0	127	0	0		127
	36	23004051	Central Kakaako						2,688		WAREHOUSE	0	0	0	0	0	248		248
	36	23004069	Central Kakaako				900				OFF ENCL WAREHSE	0	0	0	63	0	0		63
	36	23004069	Central Kakaako						7,280		WAREHOUSE	0	0	0	0	0	670		670
	35	23004071	Central Kakaako					565			RETAIL STORE	0	0	0	0	39	0		39
HOKUA AT 1288 ALA MOANA	63E	23005001	Auahi				32,282				OFFICES	0	0	0	2228	0	0		2228
HOKUA AT 1288 ALA MOANA	63E	23005001	Auahi		248						APARTMENT	0	99200	0	0	0	0		99200
	65 (HH 4)	23005004	Auahi				22,687				OFFICES	0	0	0	1566	0	0		1566
	65 (HH 4)	23005004	Auahi					3,937			MEZZ DISPLAY SALES	0	0	0	0	272	0		272
	65 (HH 4)	23005006	Auahi					920			MEZZ DISPLAY SALES	0	0	0	0	64	0		64
	65 (HH 4)	23005006	Auahi								PARK STRUCTURE	0	0	0	0	0	0		0
	65 (HH 4)	23005006	Auahi					116,370			RETAIL STORE	0	0	0	0	8030	0		8030
	63H (HH 3)	23005013	Auahi					68,079			DEPARTMENT STORE	0	0	0	0	4698	0		4698
	63H (HH 3)	23005013	Auahi					6,081			MEZZ DISPLAY SALES	0	0	0	0	420	0		420
	63H (HH 3)	23005013	Auahi								PARK STRUCTURE	0	0	0	0	0	0		0
WARD VILLAGE SHOPS	63H (HH 3)	23005014	Auahi					129,778			DEPARTMENT STORE	0	0	0	0	8955	0		8955
	63H (HH 3)	23005019	Auahi					15,704			RETAIL STORE	0	0	0	0	1084	0		1084
1350 ALA MOANA	63E	23006001	Auahi		353						APARTMENT	0	141200	0	0	0	0		141200
NAURU TOWER	63E	23006003	Auahi						4,788		WAREHOUSE	0	0	0	0	0	441		441
NAURU TOWER	63E	23006003	Auahi				11,184				OFFICES	0	0	0	772	0	0		772
NAURU TOWER	63E	23006003	Auahi							10,740	RESTAURANT	0	0	0	0	0	0	742 Commercial	742
NAURU TOWER	63E	23006003	Auahi		430						APARTMENT	0	172000	0	0	0	0		172000
HAWAIKI TOWER	63E	23006004	Auahi				41,940				OFFICES	0	0	0	2894	0	0		2894
HAWAIKI TOWER	63E	23006004	Auahi		417						APARTMENT	0	166800	0	0	0	0		166800
KOOLANI	63E	23006014	Auahi		370						APARTMENT	0	148000	0	0	0	0		148000
KOOLANI	63E	23006014	Auahi				20,516				OFFICES	0	0	0	1416	0	0		1416
WAIHONUA	63E	23006017	Auahi		345						APARTMENT	0	138000	0	0	0	0		138000
	39	23007023	Central Kakaako				17,057				OFFICES	0	0	0	1177	0	0		1177
	39	23007026	Central Kakaako						2,512		WAREHOUSE	0	0	0	0	0	232		232
	39	23007027	Central Kakaako				7,628				OFFICES	0	0	0	527	0	0		527
	39	23007028	Central Kakaako							5,680	BAR LOUNGE	0	0	0	0	0	0	392 Commercial	392
	39	23007028	Central Kakaako						7,360		WAREHOUSE	0	0	0	0	0	678		678
	39	23007029	Central Kakaako				4,458				OFFICES	0	0	0	308	0	0		308
	36	23007033	Central Kakaako				1,470				OFF ENCL WAREHSE	0	0	0	102	0	0		102
	36	23007033	Central Kakaako						6,616		WAREHOUSE	0	0	0	0	0	609		609
	36	23007036	Central Kakaako				896				OFF ENCL WAREHSE	0	0	0	62	0	0		62
	36	23007036	Central Kakaako				896				OFFICES	0	0	0	62	0	0		62
	36	23007036	Central Kakaako						4,509		WAREHOUSE	0	0	0	0	0	415		415
	36	23007039	Central Kakaako								BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	36	23007039	Central Kakaako						7,192		WAREHOUSE	0	0	0	0	0	662		662

	Land Use: Existing Condition											Water							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Commercial	General / Light Industry	Other	Average Day Flow
												500	400	350	69	69	92		
				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
	39	23007044	Central Kakaako				3,710				OFFICES	0	0	0	256	0	0		256
	39	23007045	Central Kakaako						8,460		WAREHOUSE	0	0	0	0	0	779		779
	39	23007049	Central Kakaako					2,045			RETAIL STORE	0	0	0	0	142	0		142
	39	23007049	Central Kakaako						18,240		WAREHOUSE	0	0	0	0	0	1679		1679
	38	23007054	Central Kakaako							1,288	RESTAURANT	0	0	0	0	0	0	89 Commercial	89
	38	23007054	Central Kakaako						1,664		WAREHOUSE	0	0	0	0	0	154		154
	38	23007056	Central Kakaako						4,051		WAREHOUSE	0	0	0	0	0	373		373
	38	23007057	Central Kakaako						14,960		MANUFACTURING	0	0	0	0	0	1377		1377
	38	23007057	Central Kakaako							28,140	RESTAURANT	0	0	0	0	0	0	1942 Commercial	1942
	38	23007061	Central Kakaako								BENEATH BLDG PARK ENCL	0	0	0	0	0	0		0
	38	23007061	Central Kakaako				2,100				MEZZ ENCL OFFICE	0	0	0	145	0	0		145
	38	23007061	Central Kakaako						4,500		WAREHOUSE	0	0	0	0	0	414		414
	38	23007062	Central Kakaako					1,200			MEZZ DISPLAY SALES	0	0	0	0	83	0		83
	38	23007062	Central Kakaako						8,228		WAREHOUSE	0	0	0	0	0	757		757
	38	23007063	Central Kakaako						8,000		WAREHOUSE	0	0	0	0	0	736		736
	37	23007064	Central Kakaako				1,584				AUTO SHOWROOM/OFFICE	0	0	0	110	0	0		110
	37	23007064	Central Kakaako						6,037		WAREHOUSE	0	0	0	0	0	556		556
	37	23007066	Central Kakaako				1,144				OFF ENCL WAREHSE	0	0	0	79	0	0		79
	37	23007066	Central Kakaako						6,608		WAREHOUSE	0	0	0	0	0	608		608
	37	23007067	Central Kakaako				910				OFF ENCL WAREHSE	0	0	0	63	0	0		63
	37	23007067	Central Kakaako						6,760		WAREHOUSE	0	0	0	0	0	622		622
	37	23007069	Central Kakaako				360				MEZZ ENCL OFFICE	0	0	0	25	0	0		25
	37	23007069	Central Kakaako				1,608				OFF ENCL WAREHSE	0	0	0	111	0	0		111
	37	23007069	Central Kakaako						32,137		WAREHOUSE	0	0	0	0	0	2957		2957
	37	23007078	Central Kakaako				2,577				OFFICES	0	0	0	178	0	0		178
	37	23007078	Central Kakaako						11,332		WAREHOUSE	0	0	0	0	0	1043		1043
	38	23007092	Central Kakaako							1,724	TAVERN/BAR	0	0	0	0	0	0	119 Commercial	119
	38	23007093	Central Kakaako				5,385				OFFICES	0	0	0	372	0	0		372
	38	23007093	Central Kakaako							5,385	RESTAURANT	0	0	0	0	0	0	372 Commercial	372
	23	23007098	Kapiolani							2,030	RESTAURANT	0	0	0	0	0	0	141 Commercial	141
	23	23007099	Kapiolani								PARK STRUCTURE	0	0	0	0	0	0		0
	23	23007100	Kapiolani				4,823				OFFICES	0	0	0	333	0	0		333
	23	23007107	Kapiolani				31,933				OFFICES	0	0	0	2204	0	0		2204
	23	23007107	Kapiolani								PARKING PAR/ENCL	0	0	0	0	0	0		0
	23	23007107	Kapiolani					19,864			RETAIL STORE	0	0	0	0	1371	0		1371
BLAISDELL CENTER	7B+C	23008002	Thomas Square								PARK STRUCTURE	0	0	0	0	0	0		0
	7B+C	23008003	Thomas Square							4,747	RESTAURANT	0	0	0	0	0	0	328 Commercial	328
MCKINLEY HIGH SCHOOL	7B+C	23009001	Thomas Square								SCHOOL	0	0	0	0	0	0		0
	12	23010001	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	12	23010002	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	12	23010003	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	12	23010004	Sheridan			4					APARTMENT	0	1600	0	0	0	0		1600
	12	23010005	Sheridan			1					APARTMENT	0	400	0	0	0	0		400
	12	23010006	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	12	23010007	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	12	23010008	Sheridan	1							SF HOME	500	0	0	0	0	0		500
HAWAIIANA APTS	12	23010009	Sheridan			14					APARTMENT	0	5600	0	0	0	0		5600
RYCROFT MANOR	12	23010011	Sheridan			29					APARTMENT	0	11600	0	0	0	0		11600
	12	23010012	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	12	23010013	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010014	Sheridan			4					APARTMENT	0	1600	0	0	0	0		1600
	13	23010015	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010016	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	13	23010017	Sheridan			3					APARTMENT	0	1200	0	0	0	0		1200
	13	23010018	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010019	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010020	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	13	23010021	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	13	23010022	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010023	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	13	23010024	Sheridan			4					APARTMENT	0	1600	0	0	0	0		1600
	13	23010025	Sheridan			4					APARTMENT	0	1600	0	0	0	0		1600
	13	23010026	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010027	Sheridan			1					APARTMENT	0	400	0	0	0	0		400
MOANA PACIFIC	22	23010028	Kapiolani			1,404					APARTMENT	0	561600	0	0	0	0		561600
	13	23010083	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010092	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	13	23010093	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	13	23010094	Sheridan			3					APARTMENT	0	1200	0	0	0	0		1200
	13	23010096	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	13	23010097	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	13	23010098	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	12	23010099	Sheridan			1					APARTMENT	0	400	0	0	0	0		400
	12	23010100	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	12	23010101	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	12	23010102	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	12	23010103	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	12	23010104	Sheridan			2					APARTMENT	0	800	0	0	0	0		800
	12	23010105	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	12	23010106	Sheridan	1							SF HOME	500	0	0	0	0	0		500

	Land Use: Existing Condition											Water							
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Commercial	General / Light Industry	Other	Average Day Flow
												500	400	350	69	69	92		
				units	units	units	SF	SF	SF	SF		gal/unit	gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gal	gpd
	12	23010107	Sheridan	1							SF HOME	500	0	0	0	0	0		500
Honolulu Design Center	22	23010111	Kapiolani							19,751	RESTAURANT	0	0	0	0	0	0	1363 Commercial	1363
Honolulu Design Center	22	23010111	Kapiolani					60,112			RETAIL STORE	0	0	0	0	4148	0		4148
	10	23011002	Sheridan				460				LIBRARY	0	0	0	32	0	0		32
	10	23011002	Sheridan				969				MEZZ ENCL OFFICE	0	0	0	67	0	0		67
	10	23011002	Sheridan				2,766				OFFICES	0	0	0	191	0	0		191
	10	23011002	Sheridan							5,207	RELIGIOUS INST	0	0	0	0	0	0	360 Commercial	360
	10	23011002	Sheridan							28,573	SCHOOL	0	0	0	0	0	0	21480 60 gal/student	21480
	10	23011002	Sheridan				7,058				SOCIAL/FRATERNAL HALL	0	0	0	488	0	0		488
	8	23011003	Sheridan				955				OFFICES	0	0	0	66	0	0		66
	8	23011003	Sheridan					3,215			RETAIL STORE	0	0	0	0	222	0		222
	8	23011004	Sheridan		2						APARTMENT	0	800	0	0	0	0		800
	8	23011005	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011006	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011007	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011008	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011009	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011010	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	8	23011011	Sheridan		2						APARTMENT	0	800	0	0	0	0		800
	8	23011012	Sheridan								PARKING PAR/ENCL	0	0	0	0	0	0		0
	8	23011012	Sheridan					5,228			RETAIL STORE	0	0	0	0	361	0		361
	8	23011013	Sheridan					5,041			RETAIL STORE	0	0	0	0	348	0		348
	8	23011014	Sheridan					1,138			RETAIL STORE	0	0	0	0	79	0		79
	8	23011015	Sheridan				1,920				OFFICES	0	0	0	133	0	0		133
	8	23011015	Sheridan					1,441			RETAIL STORE	0	0	0	0	100	0		100
	8	23011016	Sheridan					2,400			RETAIL STORE	0	0	0	0	166	0		166
	8	23011017	Sheridan							1,650	RESTAURANT	0	0	0	0	0	0	114 Commercial	114
	8	23011018	Sheridan				1,281				OFFICES	0	0	0	89	0	0		89
	8	23011018	Sheridan					3,294			RETAIL STORE	0	0	0	0	228	0		228
	8	23011019	Sheridan				2,500				OFFICES	0	0	0	173	0	0		173
	8	23011019	Sheridan					2,800			RETAIL STORE	0	0	0	0	194	0		194
	9	23011021	Sheridan		4						APARTMENT	0	1600	0	0	0	0		1600
	9	23011022	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011023	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011024	Sheridan	1							SF HOME	500	0	0	0	0	0		500
ELMS	9	23011025	Sheridan		63						APARTMENT	0	25200	0	0	0	0		25200
	9	23011029	Sheridan		2						APARTMENT	0	800	0	0	0	0		800
	9	23011030	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011031	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011032	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011033	Sheridan		2						APARTMENT	0	800	0	0	0	0		800
	9	23011034	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011035	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	9	23011036	Sheridan		1						APARTMENT	0	400	0	0	0	0		400
	9	23011037	Sheridan		2						APARTMENT	0	800	0	0	0	0		800
	11	23011038	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	11	23011039	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	11	23011040	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	11	23011041	Sheridan		2						APARTMENT	0	800	0	0	0	0		800
	11	23011042	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	11	23011043	Sheridan		2						APARTMENT	0	800	0	0	0	0		800
	11	23011044	Sheridan		4						APARTMENT	0	1600	0	0	0	0		1600
	10	23011045	Sheridan		2						APARTMENT	0	800	0	0	0	0		800
	10	23011046	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	10	23011047	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	10	23011048	Sheridan		4						APARTMENT	0	1600	0	0	0	0		1600
	10	23011049	Sheridan		2						APARTMENT	0	800	0	0	0	0		800
	10	23011050	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	10	23011051	Sheridan		4						APARTMENT	0	1600	0	0	0	0		1600
	11	23011053	Sheridan	1							SF HOME	500	0	0	0	0	0		500
	10	23011054	Sheridan	1							SF HOME	500	0	0	0	0	0		500
												22,500	3,942,800	-	176,191	81,153	200,465	79,628	4,502,737
690 Pohukaina	46	21051041	Pauahi		851		19,000	76,000			APARTMENT	0	340400	0	1311	5244	0		346955
Ward Entertainment Village	62 (HH 1)	23002104	Auahi																

	Land Use: Existing Condition											Sewer								
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Retail	General / Light Industry	Other	Average Flow	Equivalent Population
												4	2.8	70	300	140	100			
				units	units	units	SF	SF	SF	SF		cap/unit	cap/unit	cap/unit	cpa	cpa	cpa	cap	gpd	cap
RESTAURANT ROW	51	21029001	Pauahi				500,812				OFFICES	-	-	-	3,449	-	-		86,228	1,078
KEAHOU LANE	45 (KS A)	21030001	Pauahi		632			41,999			APARTMENT/COMMERCIAL	-	1,770	-	-	135	-		144,975	1,812
COURTHOUSE - SINGLE STORY	1	21030003	Civic Center				68,300				OFFICES	-	-	-	470	-	-		11,760	147
	1	21030008	Civic Center						1,000		WAREHOUSE	-	-	-	-	-	2		58	1
	1	21030008	Civic Center				6,000				OFFICES	-	-	-	41	-	-		1,034	13
	1	21030013	Civic Center				2,874				OFFICES	-	-	-	20	-	-		495	6
	1	21030014	Civic Center						2,856		WAREHOUSE	-	-	-	-	-	7		164	2
	1	21030015	Civic Center				9,438				OFF ENCL WAREHSE	-	-	-	65	-	-		1,625	20
	1	21030017	Civic Center				19,907				OFFICES	-	-	-	137	-	-		3,428	43
	2	21031002	Civic Center				2,500				OFFICES	-	-	-	17	-	-		431	5
	2	21031005	Civic Center				1,533		1,533		OFFICES / WAREHOUSE	-	-	-	11	-	4		352	4
	2	21031008	Civic Center				22,753				BANK/SAVINGS INST/PARKING	-	-	-	157	-	-		3,918	49
DOT	2	21031010	Civic Center								PARK STRUCTURE	-	-	-	-	-	-	1	25	0
DOT	2	21031012	Civic Center				55,000				OFFICES	-	-	-	379	-	-		9,470	118
HFD HQ/Museum	2	21031015	Civic Center				50,050				OFFICES	-	-	-	345	-	-		8,618	108
HFD Kaka'ako Station	2	21031018	Civic Center				5,200				OFFICES	-	-	-	36	-	-		896	11
	2	21031019	Civic Center		6						APARTMENT	-	17	-	-	-	-		1,360	17
	2	21031020	Civic Center				14,200				OFFICES	-	-	-	98	-	-		2,445	31
HONUAKAHA	2	21031021	Civic Center		96		18,202				APARTMENT / OFFICES	-	269	-	125	-	-		24,654	308
	2	21031024	Civic Center				11,410				OFFICES/PARKING	-	-	-	79	-	-		1,965	25
	42	21031030	Pauahi						26,800		AUTO PARTS/SERVICE	-	-	-	-	-	62		1,539	19
	42	21031032	Pauahi				2,284		5,450		OFFICES/WAREHOUSE	-	-	-	16	-	13		707	9
	42	21031033	Pauahi				17,554				OFFICES	-	-	-	121	-	-		3,023	38
	4	21032001	Civic Center				103,433				OFFICES/PARKING	-	-	-	712	-	-		17,809	223
Mission Houses	4	21032002	Civic Center				14,163				OFFICES	-	-	-	98	-	-		2,439	30
Mission Houses	4	21032002	Civic Center						420		LIGHT MANUFACTURING	-	-	-	-	-	1		25	0
	5	21032007	Civic Center						19,289		WAREHOUSE	-	-	-	-	-	44		1,108	14
	5	21032008	Civic Center	2							SF HOME	8	-	-	-	-	-		640	8
	5	21032009	Civic Center				4,079				OFFICES	-	-	-	28	-	-		703	9
	5	21032010	Civic Center						25,004		WAREHOUSE	-	-	-	-	-	57		1,436	18
	5	21032010	Civic Center				5,002				MEZZ ENCL OFFICE	-	-	-	34	-	-		862	11
	5	21032011	Civic Center						5,893		AUTO PARTS/SERVICE	-	-	-	-	-	14		339	4
	5	21032012	Civic Center				4,060		5,893		WAREHOUSE	-	-	-	28	-	14		1,038	13
	3	21032015	Civic Center							30,186	RELIGIOUS INST	-	-	-	-	-	-	208	5,200	65
KAWAIHAO CHURCH	3	21032017	Civic Center							11,805	RELIGIOUS INST	-	-	-	-	-	-	82	2,050	26
	3	21032017	Civic Center							4,977	SCHOOL	-	-	-	-	-	-	63	1,575	20
	3	21032017	Civic Center				14,500				OFFICES	-	-	-	100	-	-		2,497	31
	3	21032022	Civic Center							6,192	SCHOOL	-	-	-	-	-	-	78	1,950	24
	3	21032022	Civic Center				6,192				OFFICES	-	-	-	43	-	-		1,067	13
	3	21032023	Civic Center						2,262		WAREHOUSE	-	-	-	-	-	5		130	2
HECO	6TS	21044003	Thomas Square				15,385				OFFICES	-	-	-	106	-	-		2,649	33
HECO	6TS	21044003	Thomas Square						140,843		WAREHOUSE	-	-	-	-	-	323		8,084	101
	6TS	21044004	Thomas Square								BENEATH BLDG PARK ENCL	-	-	-	-	-	-	1	25	0
	6TS	21044004	Thomas Square				2,769				OFFICES	-	-	-	19	-	-		477	6
HONOLULU CLUB	6TS	21044005	Thomas Square				69,299				OFFICES	-	-	-	477	-	-		11,932	149
HONOLULU CLUB	6TS	21044005	Thomas Square							10912	RESTAURANT	-	-	-	-	-	-	3274	16,370	205
HONOLULU CLUB	6TS	21044005	Thomas Square							38909	BENEATH BLDG PARK ENCL	-	-	-	-	-	-		25	0
	18	21044022	Kapiolani				84,296				OFFICES	-	-	-	581	-	-		14,514	181
	18	21044022	Kapiolani					4,679			RETAIL STORE	-	-	-	-	15	-		376	5
	18	21044022	Kapiolani						9,933		WAREHOUSE	-	-	-	-	-	23		571	7
	18	21044023	Kapiolani					36,380			AUTO SHOWROOM/OFFICE	-	-	-	-	117	-		2,924	37
	18	21044023	Kapiolani								PARK STRUCTURE	-	-	-	-	-	-	1	25	0
	18	21044023	Kapiolani						28,196		AUTO PARTS/SERVICE	-	-	-	-	-	65		1,619	20
ROYAL COURT	6TS	21044033	Thomas Square		112						APARTMENT	-	314	-	-	-	-		25,120	314
	18	21044034	Kapiolani							4000	RESTAURANT	-	-	-	-	-	-	1200	6,000	75
	6TS	21044038	Thomas Square					1,749			CONVENIENCE STORE	-	-	-	-	6	-		141	2
ONE ARCHER LANE	6TS	21044041	Thomas Square		331						APARTMENT	-	927	-	-	-	-		74,160	927
VANGUARD LOFTS	6Kap	21044046	Kapiolani		38						APARTMENT	-	107	-	-	-	-		8,560	107
VANGUARD LOFTS	6Kap	21044046	Kapiolani					3616			AUTO SHOWROOM/OFFICE	-	-	-	-	12	-		291	4
	15	21046001	Kapiolani				3,857				MEZZ ENCL OFFICE	-	-	-	27	-	-		665	8
	15	21046001	Kapiolani						10,727		AUTO PARTS/SERVICE	-	-	-	-	-	25		616	8
	15	21046001	Kapiolani					3,814			AUTO SHOWROOM/OFFICE	-	-	-	-	12	-		307	4
	15	21046002	Kapiolani							11,446	RESTAURANT	-	-	-	-	-	-	3434	17,170	215
	15	21046002	Kapiolani				14,170				OFFICES	-	-	-	98	-	-		2,440	31
	15	21046003	Kapiolani				11,993				OFFICES	-	-	-	83	-	-		2,065	26
	15	21046005	Kapiolani				2,538				OFFICES	-	-	-	17	-	-		437	5
	15	21046005	Kapiolani				6,213				MEZZ ENCL OFFICE	-	-	-	43	-	-		1,070	13
	15	21046005	Kapiolani						6,213		WAREHOUSE	-	-	-	-	-	14		357	4
	15	21046007	Kapiolani				42,978				OFFICES	-	-	-	296	-	-		7,400	93
HO'OMANA NA'AUAAO O Hawai'i - CHURCH	15	21046009	Kapiolani							6,907	RELIGIOUS INST	-	-	-	-	-	-	48	1,200	15
PACIFIC PARK PLAZA	16	21047001	Kapiolani				96,613				OFFICES	-	-	-	665	-	-		16,635	208
	14	21047002	Kapiolani								PARK STRUCTURE	-	-	-	-	-	-		-	-
801 SOUTH PH1	14	21047003	Kapiolani		636							-	1,781	-	-	-	-		142,480	1,781
801 SOUTH PH1	14	21047003	Kapiolani									-	-	-	-	-	-		-	-
801 SOUTH PH1	14	21047004	Kapiolani				66,593				OFFICES	-	-	-	459	-	-		11,466	143
801 SOUTH PH2	14	21047004	Kapiolani		410						APARTMENT	-	1,148	-	-	-	-		91,840	1,148
801 SOUTH PH2	14	21047004	Kapiolani									-	-	-	-	-	-		-	-

				Land Use: Existing Condition								Sewer								
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Retail	General / Light Industry	Other	Average Flow	Equivalent Population
				units	units	units	SF	SF	SF	SF		4	2.8	2	300	140	100			
												cap/unit	cap/unit	cap/unit	cpa	cpa	cpa	cap	gpd	cap
	14	21047005 Kapiolani						3,724			AUTO SHOWROOM/OFFICE	-	-	-	-	12	-		300	4
	14	21047005 Kapiolani							1,506		AUTO PARTS/SERVICE	-	-	-	-	-	3		87	1
	14	21047005 Kapiolani					3,984				OFFICES	-	-	-	27	-	-		686	9
ROYAL CAPITOL PLAZA	14	21047008 Kapiolani			297						APARTMENT	-	832	-	-	-	-		66,560	832
ROYAL CAPITOL PLAZA	14	21047008 Kapiolani						947			CONVENIENCE STORE	-	-	-	-	3	-		77	1
ROYAL CAPITOL PLAZA	14	21047008 Kapiolani							1,511		MINI-WAREHOUSE	-	-	-	-	-	3		87	1
	41	21048001 Pauahi							7,630		WAREHOUSE	-	-	-	-	-	18		438	5
	41	21048001 Pauahi					400				OFF ENCL WAREHSE	-	-	-	3	-	-		69	1
	41	21048002 Pauahi						7,985			RETAIL STORE	-	-	-	-	26	-		642	8
	41	21048005 Pauahi							5,158		WAREHOUSE	-	-	-	-	-	12		297	4
	41	21048005 Pauahi					3,996				MEZZ ENCL OFFICE	-	-	-	28	-	-		689	9
	41	21048006 Pauahi							40,491		WAREHOUSE	-	-	-	-	-	93		2,324	29
	41	21048006 Pauahi					19,096				MEZZ ENCL OFFICE	-	-	-	132	-	-		3,288	41
KEOLA LAI	40	21048008 Pauahi			353						APARTMENT	-	989	-	-	-	-		79,120	989
KEOLA LAI	40	21048008 Pauahi						8,607			RETAIL STORE	-	-	-	-	28	-		692	9
	41	21048022 Pauahi								1,334	RESTAURANT	-	-	-	-	-	-	401	2,005	25
	41	21048022 Pauahi					812				OFFICES	-	-	-	6	-	-		140	2
	41	21048022 Pauahi			4						APARTMENT	-	12	-	-	-	-		960	12
	27	21049001 Central Kakaako							2,629		SERVICE STATION W/BAYS	-	-	-	-	-	6		151	2
	27	21049003 Central Kakaako			1						APARTMENT	-	3	-	-	-	-		240	3
	27	21049003 Central Kakaako					1,650				OFFICES	-	-	-	11	-	-		285	4
	27	21049004 Central Kakaako							2,100		WAREHOUSE	-	-	-	-	-	5		121	2
	27	21049005 Central Kakaako			2						APARTMENT	-	6	-	-	-	-		480	6
	26	21049008 Central Kakaako					4,917				OFFICES	-	-	-	34	-	-		847	11
	26	21049009 Central Kakaako							2,500		AUTO PARTS/SERVICE	-	-	-	-	-	6		144	2
	26	21049010 Central Kakaako							3,750		WAREHOUSE	-	-	-	-	-	9		216	3
	26	21049011 Central Kakaako					855				OFFICES	-	-	-	6	-	-		148	2
	26	21049011 Central Kakaako							27,860		WAREHOUSE	-	-	-	-	-	64		1,599	20
	26	21049012 Central Kakaako					902				OFFICES	-	-	-	6	-	-		156	2
	26	21049014 Central Kakaako							1,970		AUTO PARTS/SERVICE	-	-	-	-	-	5		114	1
	26	21049014 Central Kakaako					132				OFF ENCL WAREHSE	-	-	-	1	-	-		23	0
	26	21049015 Central Kakaako					700				OFFICES	-	-	-	5	-	-		121	2
	26	21049015 Central Kakaako							2,170		WAREHOUSE	-	-	-	-	-	5		125	2
	26	21049018 Central Kakaako					2,700				OFFICES	-	-	-	19	-	-		465	6
	26	21049019 Central Kakaako					14,940				OFFICES	-	-	-	103	-	-		2,573	32
	26	21049020 Central Kakaako									PARKING PAR/ENCL	-	-	-	-	-	-	1	25	0
	26	21049020 Central Kakaako						4,628			RETAIL STORE	-	-	-	-	15	-		372	5
	26	21049021 Central Kakaako							1,650		WAREHOUSE	-	-	-	-	-	4		95	1
	26	21049022 Central Kakaako							2,794		WAREHOUSE	-	-	-	-	-	6		161	2
	26	21049023 Central Kakaako					500				OFF ENCL WAREHSE	-	-	-	3	-	-		87	1
	26	21049023 Central Kakaako							6,750		WAREHOUSE	-	-	-	-	-	15		388	5
	26	21049024 Central Kakaako						1,428			RETAIL STORE	-	-	-	-	5	-		115	1
	26	21049025 Central Kakaako							4,250		WAREHOUSE	-	-	-	-	-	10		244	3
	26	21049026 Central Kakaako					808				OFFICES	-	-	-	6	-	-		140	2
	26	21049026 Central Kakaako								4,600	RESTAURANT	-	-	-	-	-	-	1380	6,900	86
IMPERIAL PLAZA	24	21049027 Central Kakaako			206						APARTMENT	-	577	-	-	-	-		46,160	577
IMPERIAL PLAZA	17	21049027 Central Kakaako						50,967			RETAIL STORE	-	-	-	-	164	-		4,096	51
IMPERIAL PLAZA	17	21049027 Central Kakaako					10,904				OFFICES	-	-	-	75	-	-		1,878	23
IMPERIAL PLAZA	17	21049027 Central Kakaako					483				MEZZ ENCL OFFICE	-	-	-	3	-	-		84	1
	26	21049028 Central Kakaako							3,600		WAREHOUSE	-	-	-	-	-	8		207	3
	26	21049029 Central Kakaako							2,000		WAREHOUSE	-	-	-	-	-	5		115	1
	26	21049030 Central Kakaako						846			MEZZ DISPLAY SALES	-	-	-	-	3	-		68	1
	26	21049030 Central Kakaako							5,000		WAREHOUSE	-	-	-	-	-	11		287	4
	26	21049031 Central Kakaako							3,945		WAREHOUSE	-	-	-	-	-	9		227	3
	26	21049032 Central Kakaako					1,000				MEZZ ENCL OFFICE	-	-	-	7	-	-		173	2
	26	21049032 Central Kakaako					1,000				OFFICES	-	-	-	7	-	-		173	2
	26	21049032 Central Kakaako							8,400		WAREHOUSE	-	-	-	-	-	19		483	6
	26	21049033 Central Kakaako					288				OFF ENCL WAREHSE	-	-	-	2	-	-		50	1
	26	21049033 Central Kakaako							3,285		WAREHOUSE	-	-	-	-	-	8		189	2
	26	21049037 Central Kakaako					200				OFFICES	-	-	-	1	-	-		35	0
	26	21049037 Central Kakaako							1,300		WAREHOUSE	-	-	-	-	-	3		75	1
	26	21049038 Central Kakaako					520				OFFICES	-	-	-	4	-	-		90	1
	26	21049038 Central Kakaako							4,000		WAREHOUSE	-	-	-	-	-	9		230	3
	24	21049040 Central Kakaako							4,000		WAREHOUSE	-	-	-	-	-	9		230	3
	24	21049041 Central Kakaako					3,000				OFFICES	-	-	-	21	-	-		517	6
	24	21049041 Central Kakaako							3,000		WAREHOUSE	-	-	-	-	-	7		173	2
	24	21049042 Central Kakaako							3,750		WAREHOUSE	-	-	-	-	-	9		216	3
	24	21049043 Central Kakaako						1,904			RETAIL STORE	-	-	-	-	6	-		153	2
	24	21049043 Central Kakaako							1,428		WAREHOUSE	-	-	-	-	-	3		82	1
	24	21049045 Central Kakaako					30,000				OFFICES	-	-	-	207	-	-		5,166	65
	24	21049045 Central Kakaako							182,450		WAREHOUSE	-	-	-	-	-	419		10,472	131
	24	21049046 Central Kakaako							1,600		WAREHOUSE	-	-	-	-	-	4		92	1
	24	21049049 Central Kakaako							1,050		WAREHOUSE	-	-	-	-	-	2		61	1
803 Waimanu	24	21049050 Central Kakaako			153						APARTMENT	-	429	-	-	-	-		34,320	429
	24	21049054 Central Kakaako						975			MEZZ DISPLAY SALES	-	-	-	-	3	-		79	1
	24	21049054 Central Kakaako					1,364				OFF ENCL WAREHSE	-	-	-	9	-	-		235	3
	24	21049054 Central Kakaako							5,353		WAREHOUSE	-	-	-	-	-	12		308	4
	25	21049055 Central Kakaako						1,620			RETAIL STORE	-	-	-	-	5	-		131	2
	25	21049055 Central Kakaako							2,250		WAREHOUSE	-	-	-	-	-	5		130	2
	25	21049056 Central Kakaako		1							SF HOME	4	-	-	-	-	-		320	4

				Land Use: Existing Condition								Sewer								
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Retail	General / Light Industry	Other	Average Flow	Equivalent Population
				units	units	units	SF	SF	SF	SF		4	2.8	2	300	140	100			
												cap/unit	cap/unit	cap/unit	cpa	cpa	cpa	cap	gpd	cap
	25	21049057 Central Kakaako		1							SF HOME	4	-	-	-	-	-		320	4
	25	21049058 Central Kakaako							4,275		WAREHOUSE	-	-	-	-	-	10		246	3
	25	21049060 Central Kakaako						1,008			RETAIL STORE	-	-	-	-	3	-		81	1
	25	21049060 Central Kakaako							2,400		WAREHOUSE	-	-	-	-	-	6		138	2
	25	21049061 Central Kakaako							3,800		WAREHOUSE	-	-	-	-	-	9		219	3
	19	21049063 Kapiolani					5,207				OFFICES	-	-	-	36	-	-		897	11
	19	21049063 Kapiolani								5,239	RESTAURANT	-	-	-	-	-	-	1572	7,860	98
	19	21049064 Kapiolani					3,022				OFFICES	-	-	-	21	-	-		521	7
	19	21049064 Kapiolani								3,478	RESTAURANT	-	-	-	-	-	-	1044	5,220	65
	19	21049066 Kapiolani						53,124			AUTO SHOWROOM/OFFICE	-	-	-	-	171	-		4,269	53
	19	21049066 Kapiolani						1,034			MEZZ DISPLAY SALES	-	-	-	-	3	-		84	1
	25	21049069 Central Kakaako						2,805			RETAIL STORE	-	-	-	-	9	-		226	3
	24	21049070 Central Kakaako					160				OFF ENCL WAREHSE	-	-	-	1	-	-		28	0
	24	21049071 Central Kakaako							1,830		WAREHOUSE	-	-	-	-	-	4		106	1
	24	21049073 Central Kakaako							7,580		WAREHOUSE	-	-	-	-	-	17		436	5
	19	21049075 Kapiolani						665			MEZZ DISPLAY SALES	-	-	-	-	2	-		54	1
	19	21049075 Kapiolani					1,501				OFFICES	-	-	-	10	-	-		259	3
	19	21049075 Kapiolani							5,267		WAREHOUSE	-	-	-	-	-	12		303	4
	24	21049076 Central Kakaako					1,026				OFFICES	-	-	-	7	-	-		177	2
	24	21049076 Central Kakaako							6,030		WAREHOUSE	-	-	-	-	-	14		347	4
	27	21049078 Central Kakaako							14,500		AUTO PARTS/SERVICE	-	-	-	-	-	33		833	10
	26	21049079 Central Kakaako							3,564		WAREHOUSE	-	-	-	-	-	8		205	3
	19	21049080 Kapiolani								3,129	RESTAURANT	-	-	-	-	-	-	939	4,695	59
	HH 5	21050001 Pauahi							9,600		WAREHOUSE	-	-	-	-	-	22		551	7
	30R	21050002 Central Kakaako					3,050				OFFICES	-	-	-	21	-	-		526	7
	30R	21050003 Central Kakaako					3,500				OFF ENCL WAREHSE	-	-	-	24	-	-		603	8
	30R	21050003 Central Kakaako							20,500		WAREHOUSE	-	-	-	-	-	47		1,177	15
	30R	21050004 Central Kakaako					6,202				OFF ENCL WAREHSE	-	-	-	43	-	-		1,068	13
	30R	21050004 Central Kakaako						3,082			RETAIL STORE	-	-	-	-	10	-		248	3
	30R	21050004 Central Kakaako							12,241		WAREHOUSE	-	-	-	-	-	28		703	9
	30R	21050007 Central Kakaako					7,030				OFFICES	-	-	-	48	-	-		1,211	15
	30R	21050007 Central Kakaako							4,029		WAREHOUSE	-	-	-	-	-	9		232	3
	30R	21050009 Central Kakaako					1,225				OFFICES	-	-	-	8	-	-		211	3
	30R	21050011 Central Kakaako					1,200				OFFICES	-	-	-	8	-	-		207	3
	30R	21050011 Central Kakaako							14,550		WAREHOUSE	-	-	-	-	-	33		836	10
	30R	21050012 Central Kakaako					1,488				OFFICES	-	-	-	10	-	-		257	3
	30R	21050012 Central Kakaako									PARKING PAR/ENCL	-	-	-	-	-	-	1	25	0
	28	21050016 Central Kakaako							6,816		WAREHOUSE	-	-	-	-	-	16		392	5
	28	21050017 Central Kakaako							5,150		WAREHOUSE	-	-	-	-	-	12		296	4
	28	21050018 Central Kakaako					6,300				OFFICES	-	-	-	43	-	-		1,085	14
	28	21050019 Central Kakaako							2,436		AUTO PARTS/SERVICE	-	-	-	-	-	6		140	2
	28	21050020 Central Kakaako							2,772		AUTO PARTS/SERVICE	-	-	-	-	-	6		160	2
	28	21050021 Central Kakaako							1,609		WAREHOUSE	-	-	-	-	-	4		93	1
	28	21050022 Central Kakaako							2,500		AUTO PARTS/SERVICE	-	-	-	-	-	6		144	2
	28	21050023 Central Kakaako							5,000		AUTO PARTS/SERVICE	-	-	-	-	-	11		287	4
	28	21050024 Central Kakaako					320				OFFICES	-	-	-	-	2	-		56	1
	28	21050027 Central Kakaako						720			MEZZ DISPLAY SALES	-	-	-	-	2	-		58	1
	28	21050027 Central Kakaako							2,850		WAREHOUSE	-	-	-	-	-	7		164	2
	28	21050028 Central Kakaako						1,388			MEZZ DISPLAY SALES	-	-	-	-	4	-		112	1
	28	21050028 Central Kakaako					1,388				OFFICES	-	-	-	10	-	-		239	3
	28	21050028 Central Kakaako							8,200		WAREHOUSE	-	-	-	-	-	19		471	6
	28	21050030 Central Kakaako							9,750		LIGHT MANUFACTURING	-	-	-	-	-	22		560	7
	28	21050030 Central Kakaako							8,000		WAREHOUSE	-	-	-	-	-	18		460	6
	28	21050031 Central Kakaako						1,207			RETAIL STORE	-	-	-	-	4	-		97	1
	28	21050031 Central Kakaako							2,289		WAREHOUSE	-	-	-	-	-	5		132	2
	28	21050032 Central Kakaako						4,319			RETAIL STORE	-	-	-	-	14	-		348	4
	28	21050033 Central Kakaako					240				MEZZ ENCL OFFICE	-	-	-	2	-	-		42	1
	28	21050033 Central Kakaako							2,104		WAREHOUSE	-	-	-	-	-	5		121	2
	28	21050034 Central Kakaako								2,116	VETENARIAN	-	-	-	-	-	-	15	375	5
	28	21050034 Central Kakaako							4,644		WAREHOUSE	-	-	-	-	-	11		267	3
	28	21050035 Central Kakaako							6,000		WAREHOUSE	-	-	-	-	-	14		345	4
	28	21050036 Central Kakaako					557				OFFICES	-	-	-	4	-	-		96	1
	28	21050036 Central Kakaako							6,422		WAREHOUSE	-	-	-	-	-	15		369	5
	28	21050037 Central Kakaako			1						APARTMENT	-	3	-	-	-	-		240	3
	28	21050037 Central Kakaako					760				OFFICES	-	-	-	5	-	-		131	2
	28	21050038 Central Kakaako					440				MEZZ ENCL OFFICE	-	-	-	3	-	-		76	1
	28	21050039 Central Kakaako							3,772		WAREHOUSE	-	-	-	-	-	9		217	3
	28	21050042 Central Kakaako									BENEATH BLDG PARK ENCL	-	-	-	-	-	-	1	25	0
	28	21050042 Central Kakaako							7,300		WAREHOUSE	-	-	-	-	-	17		419	5
	29	21050043 Central Kakaako					905				MEZZ ENCL OFFICE	-	-	-	6	-	-		156	2
	29	21050043 Central Kakaako							3,761		WAREHOUSE	-	-	-	-	-	9		216	3
	29	21050045 Central Kakaako							2,576		AUTO PARTS/SERVICE	-	-	-	-	-	6		148	2
	29	21050046 Central Kakaako							2,972		AUTO PARTS/SERVICE	-	-	-	-	-	7		171	2
	29	21050048 Central Kakaako					1,600				MEZZ ENCL OFFICE	-	-	-	11	-	-		276	3
	29	21050048 Central Kakaako							4,050		WAREHOUSE	-	-	-	-	-	9		233	3
	29	21050049 Central Kakaako			2						APARTMENT	-	6	-	-	-	-		480	6
	29	21050052 Central Kakaako					3,096				BANK/SAVINGS INST	-	-	-	21	-	-		534	7
	29	21050052 Central Kakaako					6,943				MEZZ ENCL OFFICE	-	-	-	48	-	-		1,196	15
	28	21050054 Central Kakaako						7,150			RETAIL STORE	-	-	-	-	23	-		575	7
	28	21050055 Central Kakaako							2,000		WAREHOUSE	-	-	-	-	-	5		115	1

				Land Use: Existing Condition								Sewer								
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Retail	General / Light Industry	Other	Average Flow	Equivalent Population
				units	units	units	SF	SF	SF	SF		4	2.8	2	300	140	100			
												cap/unit	cap/unit	cap/unit	cpa	cpa	cpa	cap	gpd	cap
	29	21050056	Central Kakaako						2,075		AUTO PARTS/SERVICE	-	-	-	-	-	5		120	2
	28	21050057	Central Kakaako						3,000		WAREHOUSE	-	-	-	-	-	7		173	2
	30R	21050058	Central Kakaako						5,677		LIGHT MANUFACTURING	-	-	-	-	-	13		326	4
	28	21050059	Central Kakaako						2,900		LIGHT MANUFACTURING	-	-	-	-	-	7		167	2
	28	21050060	Central Kakaako						960		WAREHOUSE	-	-	-	-	-	2		56	1
	HH 5	21050061	Pauahi					12,800			RETAIL STORE	-	-	-	-	41	-		1,029	13
	HH 5	21050061	Pauahi						15,429		WAREHOUSE	-	-	-	-	-	35		886	11
	HH 5	21050062	Pauahi							4,808	RESTAURANT	-	-	-	-	-	-	1443	7,215	90
	HH 5	21050062	Pauahi						4,808		WAREHOUSE	-	-	-	-	-	11		276	3
KAUHALE Kaka'ako	30R	21050070	Central Kakaako		269						APARTMENT	-	754	-	-	-	-		60,320	754
KAUHALE Kaka'ako	30R	21050070	Central Kakaako							7,108	SCHOOL	-	-	-	-	-	-	89	2,225	28
KAUHALE Kaka'ako	30R	21050070	Central Kakaako				3,763				OFFICES	-	-	-	26	-	-		648	8
KAUHALE Kaka'ako	30R	21050070	Central Kakaako					220			CONVENIENCE STORE	-	-	-	-	1	-		18	0
KAUHALE Kaka'ako	30R	21050070	Central Kakaako								BENEATH BLDG PARK ENCL	-	-	-	-	-	-	1	25	0
	44	21051001	Pauahi				9,128				MEZZ ENCL OFFICE	-	-	-	63	-	-		1,572	20
	44	21051002	Pauahi						10,775		AUTO PARTS/SERVICE	-	-	-	-	-	25		619	8
	44	21051002	Pauahi				16,000				OFFICES	-	-	-	110	-	-		2,755	34
	44	21051002	Pauahi						15,916		WAREHOUSE	-	-	-	-	-	37		914	11
	43	21051007	Pauahi				18,028				OFFICES	-	-	-	124	-	-		3,104	39
	43	21051010	Pauahi						7,589		WAREHOUSE	-	-	-	-	-	17		436	5
	43	21051011	Pauahi						17,000		WAREHOUSE	-	-	-	-	-	39		976	12
	43	21051012	Pauahi				1,480				OFFICES	-	-	-	10	-	-		255	3
	43	21051012	Pauahi						29,687		WAREHOUSE	-	-	-	-	-	68		1,704	21
POHULANI	43	21051013	Pauahi		262						APARTMENT	-	734	-	-	-	-		58,720	734
	43	21051018	Pauahi				2,592				MEZZ ENCL OFFICE	-	-	-	18	-	-		447	6
	43	21051018	Pauahi						6,570		WAREHOUSE	-	-	-	-	-	15		378	5
	43	21051031	Pauahi				3,259				OFF ENCL WAREHSE	-	-	-	22	-	-		562	7
	43	21051033	Pauahi		3						APARTMENT	-	9	-	-	-	-		720	9
	43	21051033	Pauahi				47,715				OFFICES	-	-	-	329	-	-		8,216	103
	43	21051033	Pauahi							16,470	RACQUET BALL COURT	-	-	-	-	-	-	38	950	12
NĀ LE HULU KŪPUNA	44	21051038	Pauahi		76						APARTMENT	-	213	-	-	-	-		17,040	213
NĀ LE HULU KŪPUNA	44	21051038	Pauahi				1,995				OFFICES	-	-	-	14	-	-		344	4
LIBRARY WAREHOUSE /	46	21051041	Pauahi						18,000		WAREHOUSE	-	-	-	-	-	41		1,034	13
Halekauwila Place	46	21051042	Pauahi		203						APARTMENT	-	569	-	-	-	-		45,520	569
	48N (not HH)	21052001	Pauahi				4,340				MEZZ ENCL OFFICE	-	-	-	30	-	-		748	9
	48N (not HH)	21052001	Pauahi						23,334		WAREHOUSE	-	-	-	-	-	54		1,340	17
	48N (not HH)	21052002	Pauahi				405				OFF ENCL WAREHSE	-	-	-	3	-	-		70	1
	48N (not HH)	21052002	Pauahi						3,080		WAREHOUSE	-	-	-	-	-	7		177	2
	48N (not HH)	21052003	Pauahi				312				MEZZ ENCL OFFICE	-	-	-	2	-	-		54	1
	48N (not HH)	21052003	Pauahi						1,968		WAREHOUSE	-	-	-	-	-	5		113	1
	48N (not HH)	21052005	Pauahi						6,320		WAREHOUSE	-	-	-	-	-	15		363	5
	48N (not HH)	21052007	Pauahi				280				OFF ENCL WAREHSE	-	-	-	2	-	-		49	1
	48N (not HH)	21052007	Pauahi						6,222		WAREHOUSE	-	-	-	-	-	14		358	4
	48N (not HH)	21052008	Pauahi				16,800				OFFICES	-	-	-	116	-	-		2,893	36
	HH 5	21052010	Pauahi				4,992				OFFICES	-	-	-	34	-	-		860	11
	HH 5	21052011	Pauahi						8,452		MINI-WAREHOUSE	-	-	-	-	-	19		486	6
	HH 5	21052012	Pauahi				1,618				OFFICES	-	-	-	11	-	-		279	3
	HH 5	21052012	Pauahi						32,998		WAREHOUSE	-	-	-	-	-	76		1,894	24
	48N (not HH)	21052013	Pauahi						11,978		WAREHOUSE	-	-	-	-	-	27		688	9
	HH 5	21052017	Pauahi				3,530				MEZZ ENCL OFFICE	-	-	-	24	-	-		608	8
	HH 5	21052017	Pauahi						4,340		WAREHOUSE	-	-	-	-	-	10		250	3
	HH 5	21052020	Pauahi				16,936				OFFICES	-	-	-	117	-	-		2,916	36
	HH 5	21052020	Pauahi					15,668			RETAIL STORE	-	-	-	-	50	-		1,259	16
	HH 5	21052024	Pauahi				10,403				OFFICES	-	-	-	72	-	-		1,792	22
	HH 5	21052027	Pauahi				4,936				OFFICES	-	-	-	34	-	-		850	11
	HH 5	21052027	Pauahi							4,936	RESTAURANT	-	-	-	-	-	-	1481	7,405	93
	HH 5	21052028	Pauahi				8,571				OFFICES	-	-	-	59	-	-		1,476	18
	HH 5	21052028	Pauahi						3,380		WAREHOUSE	-	-	-	-	-	8		194	2
	HH 5	21052031	Pauahi				2,800				MEZZ ENCL OFFICE	-	-	-	19	-	-		483	6
	HH 5	21052031	Pauahi						2,800		WAREHOUSE	-	-	-	-	-	6		161	2
	HH 5	21052032	Pauahi				10,000				OFFICES	-	-	-	69	-	-		1,722	22
	HH 5	21052033	Pauahi				3,240				OFF ENCL WAREHSE	-	-	-	22	-	-		558	7
	HH 5	21052034	Pauahi				740				MEZZ ENCL OFFICE	-	-	-	5	-	-		128	2
	HH 5	21052034	Pauahi						3,050		WAREHOUSE	-	-	-	-	-	7		176	2
	HH 5	21052035	Pauahi				4,300				OFFICES	-	-	-	30	-	-		741	9
	HH 5	21052036	Pauahi				10,320				OFFICES	-	-	-	71	-	-		1,777	22
	HH 5	21052038	Pauahi				4,000				OFF ENCL WAREHSE	-	-	-	28	-	-		689	9
	HH 5	21052039	Pauahi				680				OFFICES	-	-	-	5	-	-		118	1
	HH 5	21052039	Pauahi						8,000		WAREHOUSE	-	-	-	-	-	18		460	6
	HH 5	21052040	Pauahi						4,000		WAREHOUSE	-	-	-	-	-	9		230	3
	HH 5	21052042	Pauahi				4,640				MEZZ ENCL OFFICE	-	-	-	32	-	-		799	10
	HH 5	21052042	Pauahi				12,600				OFF ENCL WAREHSE	-	-	-	87	-	-		2,170	27
	HH 5	21052043	Pauahi				2,214				MEZZ ENCL OFFICE	-	-	-	15	-	-		382	5
	HH 5	21052043	Pauahi						12,600		WAREHOUSE	-	-	-	-	-	29		724	9
	HH 5	21052045	Pauahi					3,050			RETAIL STORE	-	-	-	-	10	-		246	3
	HH 5	21052046	Pauahi						9,271		WAREHOUSE	-	-	-	-	-	21		533	7
	HH 5	21052051	Pauahi				510				OFF ENCL WAREHSE	-	-	-	4	-	-		88	1
	HH 5	21052051	Pauahi						3,000		WAREHOUSE	-	-	-	-	-	7		173	2
	HH 5	21052052	Pauahi				720				OFFICES	-	-	-	5	-	-		124	2
	HH 5	21052052	Pauahi						2,700		WAREHOUSE	-	-	-	-	-	6		155	2

				Land Use: Existing Condition								Sewer								
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Retail	General / Light Industry	Other	Average Flow	Equivalent Population
				units	units	units	SF	SF	SF	SF		4	2.8	2	300	140	100			
												cap/unit	cap/unit	cap/unit	cpa	cpa	cpa	cap	gpd	cap
	HH 5	21052053	Pauahi						4,440		WAREHOUSE	-	-	-	-	-	10		255	3
	HH 5	21052054	Pauahi	1							SF HOME	4	-	-	-	-	-		320	4
	HH 5	21053001	Pauahi						50,880		WAREHOUSE	-	-	-	-	-	117		2,921	37
	HH 5	21053030	Pauahi					17,273			RETAIL STORE	-	-	-	-	56	-		1,388	17
	HH 5	21053030	Pauahi				14,096				OFFICES	-	-	-	97	-	-		2,427	30
	55 (KS D)	21053032	Pauahi						109,011		WAREHOUSE	-	-	-	-	-	250		6,257	78
	55 (KS D)	21053032	Pauahi					20,000			MEZZ DISPLAY SALES	-	-	-	-	64	-		1,607	20
	55 (KS D)	21053032	Pauahi							4,784	BAR LOUNGE	-	-	-	-	-	-	240	1,200	15
	55 (KS D)	21053032	Pauahi				3,275				MEZZ ENCL OFFICE	-	-	-	23	-	-		564	7
	53	21054021	Pauahi						80,321		WAREHOUSE	-	-	-	-	-	184		4,610	58
	53	21054021	Pauahi				4,403				OFF ENCL WAREHSE	-	-	-	30	-	-		759	9
	53	21054021	Pauahi					40,941			RETAIL STORE	-	-	-	-	132	-		3,290	41
	53	21054021	Pauahi				11,150				OFFICES	-	-	-	77	-	-		1,920	24
ONE WATERFRONT TOWERS	52X	21054022	Pauahi				49,891				OFFICES	-	-	-	344	-	-		8,591	107
ONE WATERFRONT TOWERS	52X	21054022	Pauahi		306						APARTMENT	-	857	-	-	-	-		68,560	857
	52 (KS B)	21054025	Pauahi						40,728		WAREHOUSE	-	-	-	-	-	93		2,338	29
	52 (KS B)	21054025	Pauahi				9,940				OFF ENCL WAREHSE	-	-	-	68	-	-		1,712	21
	52 (KS B)	21054025	Pauahi					18,373			RETAIL STORE	-	-	-	-	59	-		1,477	18
	52 (KS B)	21054027	Pauahi							17,000	SCHOOL	-	-	-	-	-	-	213	5,325	67
	52 (KS B)	21054027	Pauahi				3,000				MEZZ ENCL OFFICE	-	-	-	21	-	-		517	6
	52 (KS B)	21054028	Pauahi						24,600		WAREHOUSE	-	-	-	-	-	56		1,412	18
	52 (KS B)	21054028	Pauahi				1,300				OFF ENCL WAREHSE	-	-	-	9	-	-		224	3
	54 (KS C)	21054036	Pauahi						55,926		WAREHOUSE	-	-	-	-	-	128		3,210	40
	59	21055001	Pauahi					5,054			RETAIL STORE	-	-	-	-	16	-		407	5
	59	21055002	Pauahi				9,861				AUTO SHOWROOM/OFFICE	-	-	-	68	-	-		1,698	21
	59	21055002	Pauahi						2,565		AUTO PARTS/SERVICE	-	-	-	-	-	6		148	2
	58	21055003	Pauahi					5,480			RETAIL STORE	-	-	-	-	18	-		441	6
	58	21055003	Pauahi						8,760		WAREHOUSE	-	-	-	-	-	20		503	6
	58	21055003	Pauahi				5,480				MEZZ ENCL OFFICE	-	-	-	38	-	-		944	12
THE COLLECTION	57	21055004	Pauahi		467			12,987			APARTMENT/COMMERCIAL	-	1,308	-	-	42	-		105,684	1,321
	58	21055006	Pauahi						6,970		WAREHOUSE	-	-	-	-	-	16		401	5
	58	21055006	Pauahi				7,200				OFFICES	-	-	-	50	-	-		1,240	16
	58	21055021	Pauahi				22,128				OFFICES	-	-	-	152	-	-		3,810	48
	58	21055026	Pauahi					2,420			RETAIL STORE	-	-	-	-	8	-		195	2
	59	21055032	Pauahi						4,800		WAREHOUSE	-	-	-	-	-	11		276	3
	59	21055032	Pauahi				200				OFFICES	-	-	-	1	-	-		35	0
	59	21055033	Pauahi						7,260		WAREHOUSE	-	-	-	-	-	17		417	5
	59	21055034	Pauahi					4,961			RETAIL STORE	-	-	-	-	16	-		399	5
	59	21055035	Pauahi						5,360		WAREHOUSE	-	-	-	-	-	12		308	4
	58	21055038	Pauahi				10,644				OFFICES	-	-	-	73	-	-		1,833	23
	58	21055038	Pauahi						20,366		WAREHOUSE	-	-	-	-	-	47		1,169	15
	58	21055038	Pauahi				1,925				MEZZ ENCL OFFICE	-	-	-	13	-	-		332	4
	HH 5	21056001	Pauahi				34,376				OFFICES	-	-	-	237	-	-		5,919	74
	HH 5	21056001	Pauahi				7,136				BANK/SAVINGS INST	-	-	-	49	-	-		1,229	15
	61	21056002	Pauahi				5,256				OFFICES	-	-	-	36	-	-		905	11
	61	21056002	Pauahi						12,382		WAREHOUSE	-	-	-	-	-	28		711	9
	60	21056003	Pauahi					24,000			RETAIL STORE	-	-	-	-	77	-		1,929	24
	60	21056004	Pauahi						5,324		WAREHOUSE	-	-	-	-	-	12		306	4
	60	21056004	Pauahi				1,217				OFF ENCL WAREHSE	-	-	-	8	-	-		210	3
	60	21056004	Pauahi					12,200			AUTO SHOWROOM/OFFICE	-	-	-	-	39	-		981	12
	60	21056004	Pauahi						12,870		AUTO PARTS/SERVICE	-	-	-	-	-	30		739	9
	61	21056007	Pauahi				20,812				OFFICES	-	-	-	143	-	-		3,584	45
	61	21056008	Pauahi				1,654				OFFICES	-	-	-	11	-	-		285	4
	61	21056008	Pauahi						16,037		AUTO PARTS/SERVICE	-	-	-	-	-	37		921	12
	64 (HH 2)	23001005	Auahi					2,970			MEZZ DISPLAY SALES	-	-	-	-	10	-		239	3
	64 (HH 2)	23001005	Auahi				3,717				MEZZ ENCL OFFICE	-	-	-	26	-	-		640	8
	64 (HH 2)	23001005	Auahi								PARK STRUCTURE	-	-	-	-	-	-	1	25	0
	64 (HH 2)	23001005	Auahi							1,761	RESTAURANT	-	-	-	-	-	-	529	2,645	33
	64 (HH 2)	23001005	Auahi					110,307			RETAIL STORE	-	-	-	-	355	-		8,864	111
	62 (HH 1)	23002001	Auahi					81,945			RETAIL STORE	-	-	-	-	263	-		6,585	82
	62 (HH 1)	23002001	Auahi						80,840		WAREHOUSE	-	-	-	-	-	186		4,640	58
	62 (HH 1)	23002002	Auahi							7,481	RESTAURANT	-	-	-	-	-	-	2245	11,225	140
	62 (HH 1)	23002057	Auahi					23,567			RETAIL STORE	-	-	-	-	76	-		1,894	24
	62 (HH 1)	23002058	Auahi				1,404				OFF ENCL WAREHSE	-	-	-	10	-	-		242	3
	62 (HH 1)	23002058	Auahi						5,594		WAREHOUSE	-	-	-	-	-	13		322	4
	62 (HH 1)	23002059	Auahi				64,561				DEPARTMENT STORE	-	-	-	445	-	-		11,116	139
	62 (HH 1)	23002059	Auahi						17,435		WAREHOUSE	-	-	-	-	-	40		1,001	13
	62 (HH 1)	23002066	Auahi						2,458		WAREHOUSE	-	-	-	-	-	6		142	2
	62 (HH 1)	23002069	Auahi						4,000		WAREHOUSE	-	-	-	-	-	9		230	3
	62 (HH 1)	23002104	Auahi								BENEATH BLDG PARK ENCL	-	-	-	-	-	-	1	25	0
	62 (HH 1)	23002104	Auahi							86,676	CINEMA	-	-	-	-	-	-	20,000	100,000	1,250
1	62 (HH 1)	23002104	Auahi							38,700	RESTAURANT	-	-	-	-	-	-	11610	58,050	726
	62 (HH 1)	23002104	Auahi					27,066			RETAIL STORE	-	-	-	-	87	-		2,175	27
	34	23003004	Central Kakaako					2,900			MEZZ DISPLAY SALES	-	-	-	-	9	-		234	3
	34	23003004	Central Kakaako				2,900				OFFICES	-	-	-	20	-	-		500	6
	34	23003005	Central Kakaako				3,249				OFFICES	-	-	-	22	-	-		560	7
	34	23003005	Central Kakaako						1,000		WAREHOUSE	-	-	-	-	-	2		58	1
	34	23003006	Central Kakaako						2,790		WAREHOUSE	-	-	-	-	-	6		161	2

				Land Use: Existing Condition								Sewer								
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Retail	General / Light Industry	Other	Average Flow	Equivalent Population
												4	2.8	2	300	140	100			
				units	units	units	SF	SF	SF	SF		cap/unit	cap/unit	cap/unit	cpa	cpa	cpa	cap	gpd	cap
	34	23003007	Central Kakaako		2						APARTMENT	-	6	-	-	-	-		480	6
	34	23003008	Central Kakaako				21,888				MINI-WAREHOUSE	-	-	-	151	-	-		3,769	47
	34	23003008	Central Kakaako				2,786				OFF ENCL WAREHSE	-	-	-	19	-	-		480	6
	34	23003008	Central Kakaako						21,207		WAREHOUSE	-	-	-	-	-	49		1,218	15
	34	23003011	Central Kakaako				1,732				OFF ENCL WAREHSE	-	-	-	12	-	-		299	4
	34	23003011	Central Kakaako							3,000	RACQUET BALL COURT	-	-	-	-	-	-	7	175	2
	34	23003012	Central Kakaako						2,784		WAREHOUSE	-	-	-	-	-	6		160	2
	34	23003013	Central Kakaako				3,000				OFFICES	-	-	-	21	-	-		517	6
	34	23003014	Central Kakaako									-	-	-	-	-	-		-	-
	34	23003015	Central Kakaako				15,000				OFFICES	-	-	-	103	-	-		2,583	32
KAMAKEE VISTA	34	23003018	Central Kakaako		226						APARTMENT	-	633	-	-	-	-		50,640	633
KAMAKEE VISTA	34	23003018	Central Kakaako				736				MEZZ ENCL OFFICE	-	-	-	5	-	-		127	2
KAMAKEE VISTA	34	23003018	Central Kakaako				15,285				OFFICES	-	-	-	105	-	-		2,632	33
KAMAKEE VISTA	34	23003018	Central Kakaako								PARKING PAR/ENCL	-	-	-	-	-	-		-	-
KAMAKEE VISTA	34	23003018	Central Kakaako							9,059	SCHOOL	-	-	-	-	-	-	114	2,850	36
	32	23003019	Central Kakaako						1,792		WAREHOUSE	-	-	-	-	-	4		103	1
	32	23003020	Central Kakaako				969				MEZZ ENCL OFFICE	-	-	-	7	-	-		167	2
	32	23003020	Central Kakaako						9,969		WAREHOUSE	-	-	-	-	-	23		573	7
	32	23003021	Central Kakaako						3,500		WAREHOUSE	-	-	-	-	-	8		201	3
	32	23003022	Central Kakaako					2,472			MEZZ DISPLAY SALES	-	-	-	-	8	-		199	2
	32	23003022	Central Kakaako				948				MEZZ ENCL OFFICE	-	-	-	7	-	-		164	2
	32	23003022	Central Kakaako				556				OFF ENCL WAREHSE	-	-	-	4	-	-		96	1
	32	23003022	Central Kakaako						7,120		WAREHOUSE	-	-	-	-	-	16		409	5
	32	23003023	Central Kakaako						8,455		WAREHOUSE	-	-	-	-	-	19		486	6
	32	23003024	Central Kakaako				6,493				OFFICES	-	-	-	45	-	-		1,118	14
	32	23003024	Central Kakaako					5,513			RETAIL STORE	-	-	-	-	18	-		443	6
	32	23003026	Central Kakaako						4,018		LIGHT MANUF/ACTURING	-	-	-	-	-	9		231	3
	32	23003026	Central Kakaako				690				MEZZ ENCL OFFICE	-	-	-	5	-	-		119	1
	32	23003026	Central Kakaako							1,890	RESTAURANT	-	-	-	-	-	-	567	2,835	35
	32	23003028	Central Kakaako						2,940		WAREHOUSE	-	-	-	-	-	7		169	2
	32	23003030	Central Kakaako	1							SF HOME	4	-	-	-	-	-		320	4
	32	23003031	Central Kakaako				312				MEZZ ENCL OFFICE	-	-	-	2	-	-		54	1
	32	23003031	Central Kakaako				572				OFFICES	-	-	-	4	-	-		99	1
	32	23003031	Central Kakaako						1,628		WAREHOUSE	-	-	-	-	-	4		94	1
	32	23003032	Central Kakaako		1						APARTMENT	-	3	-	-	-	-		240	3
	32	23003032	Central Kakaako								BENEATH BLDG PARK ENCL	-	-	-	-	-	-	1	25	0
	32	23003032	Central Kakaako				2,526				OFFICES	-	-	-	17	-	-		435	5
	33	23003037	Central Kakaako						8,550		WAREHOUSE	-	-	-	-	-	20		491	6
	33	23003038	Central Kakaako				2,800				MEZZ ENCL OFFICE	-	-	-	19	-	-		483	6
	33	23003038	Central Kakaako				2,800				OFF ENCL WAREHSE	-	-	-	19	-	-		483	6
	33	23003038	Central Kakaako						13,680		WAREHOUSE	-	-	-	-	-	31		786	10
	33	23003043	Central Kakaako				24,064				OFFICES	-	-	-	166	-	-		4,144	52
	33	23003046	Central Kakaako						4,414		WAREHOUSE	-	-	-	-	-	10		254	3
	33	23003047	Central Kakaako						3,000		WAREHOUSE	-	-	-	-	-	7		173	2
	33	23003048	Central Kakaako						3,800		WAREHOUSE	-	-	-	-	-	9		219	3
	33	23003049	Central Kakaako				3,936				OFFICES	-	-	-	27	-	-		678	8
	33	23003049	Central Kakaako					3,936			RETAIL STORE	-	-	-	-	13	-		317	4
	33	23003059	Central Kakaako						27,158		WAREHOUSE	-	-	-	-	-	62		1,559	19
	31	23003061	Central Kakaako								BENEATH BLDG PARK ENCL	-	-	-	-	-	-	1	25	0
	31	23003061	Central Kakaako				4,199				OFFICES	-	-	-	29	-	-		723	9
	31	23003061	Central Kakaako							1,409	RESTAURANT	-	-	-	-	-	-	423	2,115	26
	31	23003062	Central Kakaako								BENEATH BLDG PARK ENCL	-	-	-	-	-	-	1	25	0
	31	23003062	Central Kakaako						7,500		WAREHOUSE	-	-	-	-	-	17		431	5
	31	23003063	Central Kakaako				480				OFF ENCL WAREHSE	-	-	-	3	-	-		83	1
	31	23003063	Central Kakaako						1,920		WAREHOUSE	-	-	-	-	-	4		111	1
	31	23003064	Central Kakaako						10,000		WAREHOUSE	-	-	-	-	-	23		574	7
	31	23003065	Central Kakaako				1,446				OFFICES	-	-	-	10	-	-		249	3
	31	23003065	Central Kakaako						2,644		WAREHOUSE	-	-	-	-	-	6		152	2
	31	23003066	Central Kakaako						6,500		WAREHOUSE	-	-	-	-	-	15		374	5
	31	23003067	Central Kakaako				7,530				MEZZ ENCL OFFICE	-	-	-	52	-	-		1,297	16
	31	23003067	Central Kakaako				2,244				OFF ENCL WAREHSE	-	-	-	15	-	-		387	5
	31	23003067	Central Kakaako						12,504		WAREHOUSE	-	-	-	-	-	29		718	9
	31	23003068	Central Kakaako				1,600				OFF ENCL WAREHSE	-	-	-	11	-	-		276	3
	31	23003068	Central Kakaako						3,680		WAREHOUSE	-	-	-	-	-	8		212	3
	31	23003069	Central Kakaako				1,520				MEZZ ENCL OFFICE	-	-	-	10	-	-		262	3
	31	23003069	Central Kakaako						3,560		WAREHOUSE	-	-	-	-	-	8		205	3
	20	23003071	Kapiolani				1,287				MEZZ ENCL OFFICE	-	-	-	9	-	-		222	3
	20	23003071	Kapiolani				2,803				MEZZ ENCL OFFICE	-	-	-	19	-	-		483	6
	20	23003071	Kapiolani						7,127		WAREHOUSE	-	-	-	-	-	16		410	5
909 Kapiolani	20	23003073	Kapiolani		228						APARTMENT	-	639	-	-	-	-		51,120	639
909 Kapiolani	20	23003073	Kapiolani				3,923				OFFICES	-	-	-	27	-	-		676	8
909 Kapiolani	20	23003073	Kapiolani						4,838		WAREHOUSE	-	-	-	-	-	11		278	3
	20	23003074	Kapiolani						1,680		AUTO PARTS/SERVICE	-	-	-	-	-	4		97	1
	20	23003074	Kapiolani				1,000				OFFICES	-	-	-	7	-	-		173	2
	20	23003075	Kapiolani				16,990				MINI-WAREHOUSE	-	-	-	117	-	-		2,926	37
	31	23003078	Central Kakaako				2,684				OFF ENCL WAREHSE	-	-	-	18	-	-		463	6
	31	23003078	Central Kakaako						9,200		WAREHOUSE	-	-	-	-	-	21		529	7
	32	23003081	Central Kakaako				2,016				OFFICES	-	-	-	14	-	-		348	4
	32	23003083	Central Kakaako				720				OFF ENCL WAREHSE	-	-	-	5	-	-		124	2
	32	23003083	Central Kakaako						2,240		WAREHOUSE	-	-	-	-	-	5		129	2

				Land Use: Existing Condition								Sewer								
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Retail	General / Light Industry	Other	Average Flow	Equivalent Population
												4	2.8	2	300	140	100			
				units	units	units	SF	SF	SF	SF		cap/unit	cap/unit	cap/unit	cpa	cpa	cpa	cap	gpd	cap
	31	23003090	Central Kakaako				1,250				OFFICES	-	-	-	9	-	-		216	3
	31	23003091	Central Kakaako							7,500	RESTAURANT	-	-	-	-	-	-	2250	11,250	141
	31	23003092	Central Kakaako						3,650		WAREHOUSE	-	-	-	-	-	8		210	3
	31	23003093	Central Kakaako				835				MEZZ ENCL OFFICE	-	-	-	6	-	-		144	2
	31	23003093	Central Kakaako						6,880		WAREHOUSE	-	-	-	-	-	16		395	5
	32	23003094	Central Kakaako				942				OFFICES	-	-	-	6	-	-		163	2
	32	23003094	Central Kakaako						2,880		WAREHOUSE	-	-	-	-	-	7		166	2
	32	23003095	Central Kakaako						1,035		WAREHOUSE	-	-	-	-	-	2		60	1
	20	23003097	Kapiolani				12,228				OFFICES	-	-	-	84	-	-		2,106	26
	20	23003098	Kapiolani				13,824				OFFICES	-	-	-	95	-	-		2,381	30
	20	23003099	Kapiolani				1,911				BANK/SAVINGS INST	-	-	-	13	-	-		330	4
	20	23003099	Kapiolani				1,620				OFFICES	-	-	-	11	-	-		279	3
PACIFICA HONOLULU	20	23003105	Kapiolani		489						APARTMENT	-	1,370	-	-	-	-		109,600	1,370
PACIFICA HONOLULU	20	23003105	Kapiolani					9,985			RETAIL STORE	-	-	-	-	32	-		803	10
	21	23004002	Kapiolani				7,210				OFFICES	-	-	-	50	-	-		1,242	16
	21	23004003	Kapiolani				15,388				OFFICES	-	-	-	106	-	-		2,650	33
	21	23004003	Kapiolani					3,721			RETAIL STORE	-	-	-	-	12	-		299	4
	21	23004007	Kapiolani							4,257	RESTAURANT	-	-	-	-	-	-	1278	6,390	80
	21	23004007	Kapiolani					4,257			RETAIL STORE	-	-	-	-	14	-		343	4
	21	23004010	Kapiolani							1,888	CAR WASH AUTOMATIC	-	-	-	-	-	-		-	-
	21	23004010	Kapiolani						1,946		SERVICE STATION W/BAYS	-	-	-	-	-	4		112	1
	21	23004012	Kapiolani						8,792		WAREHOUSE	-	-	-	-	-	20		505	6
1133 WAIMANU	35	23004025	Central Kakaako		282						APARTMENT	-	790	-	-	-	-		63,200	790
	35	23004029	Central Kakaako								BENEATH BLDG PARK ENCL	-	-	-	-	-	-	1	25	0
	35	23004029	Central Kakaako				6,561				OFFICES	-	-	-	45	-	-		1,130	14
	35	23004031	Central Kakaako				576				OFFICES	-	-	-	4	-	-		100	1
	35	23004033	Central Kakaako								BENEATH BLDG PARK ENCL	-	-	-	-	-	-	1	25	0
	35	23004033	Central Kakaako				2,960				MEZZ ENCL OFFICE	-	-	-	20	-	-		510	6
	35	23004033	Central Kakaako				2,960				OFFICES	-	-	-	20	-	-		510	6
	35	23004033	Central Kakaako						7,790		WAREHOUSE	-	-	-	-	-	18		448	6
	35	23004034	Central Kakaako							1,994	RESTAURANT	-	-	-	-	-	-	599	2,995	37
	36	23004035	Central Kakaako				5,839				OFF ENCL WAREHSE	-	-	-	40	-	-		1,006	13
	36	23004035	Central Kakaako				7,274				OFFICES	-	-	-	50	-	-		1,253	16
	36	23004035	Central Kakaako						38,790		WAREHOUSE	-	-	-	-	-	89		2,227	28
	21	23004037	Kapiolani				160				OFFICES	-	-	-	1	-	-		28	0
	21	23004039	Kapiolani						1,248		AUTO PARTS/SERVICE	-	-	-	-	-	3		72	1
	36	23004048	Central Kakaako				2,130				OFF ENCL WAREHSE	-	-	-	15	-	-		367	5
	36	23004048	Central Kakaako						6,493		WAREHOUSE	-	-	-	-	-	15		373	5
	36	23004051	Central Kakaako				1,830				OFFICES	-	-	-	13	-	-		316	4
	36	23004051	Central Kakaako						2,688		WAREHOUSE	-	-	-	-	-	6		155	2
	36	23004069	Central Kakaako				900				OFF ENCL WAREHSE	-	-	-	6	-	-		155	2
	36	23004069	Central Kakaako						7,280		WAREHOUSE	-	-	-	-	-	17		418	5
	35	23004071	Central Kakaako					565			RETAIL STORE	-	-	-	-	2	-		46	1
HOKUA AT 1288 ALA MOANA	63E	23005001	Auahi				32,282				OFFICES	-	-	-	222	-	-		5,559	69
HOKUA AT 1288 ALA MOANA	63E	23005001	Auahi		248						APARTMENT	-	695	-	-	-	-		55,600	695
	65 (HH 4)	23005004	Auahi				22,687				OFFICES	-	-	-	156	-	-		3,907	49
	65 (HH 4)	23005004	Auahi					3,937			MEZZ DISPLAY SALES	-	-	-	-	13	-		317	4
	65 (HH 4)	23005006	Auahi					920			MEZZ DISPLAY SALES	-	-	-	-	3	-		74	1
	65 (HH 4)	23005006	Auahi								PARK STRUCTURE	-	-	-	-	-	-	1	25	0
	65 (HH 4)	23005006	Auahi					116,370			RETAIL STORE	-	-	-	-	374	-		9,351	117
	63H (HH 3)	23005013	Auahi					68,079			DEPARTMENT STORE	-	-	-	-	219	-		5,471	68
	63H (HH 3)	23005013	Auahi					6,081			MEZZ DISPLAY SALES	-	-	-	-	20	-		489	6
	63H (HH 3)	23005013	Auahi								PARK STRUCTURE	-	-	-	-	-	-		-	-
WARD VILLAGE SHOPS	63H (HH 3)	23005014	Auahi					129,778			DEPARTMENT STORE	-	-	-	-	417	-		10,428	130
	63H (HH 3)	23005019	Auahi					15,704			RETAIL STORE	-	-	-	-	50	-		1,262	16
1350 ALA MOANA	63E	23006001	Auahi		353						APARTMENT	-	989	-	-	-	-		79,120	989
NAURU TOWER	63E	23006003	Auahi						4,788		WAREHOUSE	-	-	-	-	-	11		275	3
NAURU TOWER	63E	23006003	Auahi				11,184				OFFICES	-	-	-	77	-	-		1,926	24
NAURU TOWER	63E	23006003	Auahi							10,740	RESTAURANT	-	-	-	-	-	-	3222	16,110	201
NAURU TOWER	63E	23006003	Auahi		430						APARTMENT	-	1,204	-	-	-	-		96,320	1,204
HAWAIKI TOWER	63E	23006004	Auahi				41,940				OFFICES	-	-	-	289	-	-		7,222	90
HAWAIKI TOWER	63E	23006004	Auahi		417						APARTMENT	-	1,168	-	-	-	-		93,440	1,168
KOOLANI	63E	23006014	Auahi		370						APARTMENT	-	1,036	-	-	-	-		82,880	1,036
KOOLANI	63E	23006014	Auahi				20,516				OFFICES	-	-	-	141	-	-		3,533	44
WAIHONUA	63E	23006017	Auahi		345						APARTMENT	-	966	-	-	-	-		77,280	966
	39	23007023	Central Kakaako				17,057				OFFICES	-	-	-	117	-	-		2,937	37
	39	23007026	Central Kakaako						2,512		WAREHOUSE	-	-	-	-	-	6		145	2
	39	23007027	Central Kakaako				7,628				OFFICES	-	-	-	53	-	-		1,314	16
	39	23007028	Central Kakaako							5,680	BAR LOUNGE	-	-	-	-	-	-	284	1,420	18
	39	23007028	Central Kakaako						7,360		WAREHOUSE	-	-	-	-	-	17		423	5
	39	23007029	Central Kakaako				4,458				OFFICES	-	-	-	31	-	-		768	10
	36	23007033	Central Kakaako				1,470				OFF ENCL WAREHSE	-	-	-	10	-	-		254	3
	36	23007033	Central Kakaako						6,616		WAREHOUSE	-	-	-	-	-	15		380	5
	36	23007036	Central Kakaako				896				OFF ENCL WAREHSE	-	-	-	6	-	-		155	2
	36	23007036	Central Kakaako				896				OFFICES	-	-	-	6	-	-		155	2
	36	23007036	Central Kakaako						4,509		WAREHOUSE	-	-	-	-	-	10		259	3
	36	23007039	Central Kakaako								BENEATH BLDG PARK ENCL	-	-	-	-	-	-	1	25	0
	36	23007039	Central Kakaako						7,192		WAREHOUSE	-	-	-	-	-	17		413	5

				Land Use: Existing Condition								Sewer								
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Retail	General / Light Industry	Other	Average Flow	Equivalent Population
												4	2.8	2	300	140	100			
				units	units	units	SF	SF	SF	SF		cap/unit	cap/unit	cap/unit	cpa	cpa	cpa	cap	gpd	cap
	39	23007044	Central Kakaako				3,710				OFFICES	-	-	-	26	-	-		639	8
	39	23007045	Central Kakaako						8,460		WAREHOUSE	-	-	-	-	-	19		486	6
	39	23007049	Central Kakaako					2,045			RETAIL STORE	-	-	-	-	7	-		165	2
	39	23007049	Central Kakaako						18,240		WAREHOUSE	-	-	-	-	-	42		1,047	13
	38	23007054	Central Kakaako							1,288	RESTAURANT	-	-	-	-	-	-	387	1,935	24
	38	23007054	Central Kakaako						1,664		WAREHOUSE	-	-	-	-	-	4		96	1
	38	23007056	Central Kakaako						4,051		WAREHOUSE	-	-	-	-	-	9		233	3
	38	23007057	Central Kakaako						14,960		MANUFACTURING	-	-	-	-	-	34		859	11
	38	23007057	Central Kakaako							28,140	RESTAURANT	-	-	-	-	-	-	8442	42,210	528
	38	23007061	Central Kakaako								BENEATH BLDG PARK ENCL	-	-	-	-	-	-	1	25	0
	38	23007061	Central Kakaako				2,100				MEZZ ENCL OFFICE	-	-	-	14	-	-		362	5
	38	23007061	Central Kakaako						4,500		WAREHOUSE	-	-	-	-	-	10		259	3
	38	23007062	Central Kakaako					1,200			MEZZ DISPLAY SALES	-	-	-	-	4	-		97	1
	38	23007062	Central Kakaako						8,228		WAREHOUSE	-	-	-	-	-	19		473	6
	38	23007063	Central Kakaako						8,000		WAREHOUSE	-	-	-	-	-	18		460	6
	37	23007064	Central Kakaako				1,584				AUTO SHOWROOM/OFFICE	-	-	-	11	-	-		273	3
	37	23007064	Central Kakaako						6,037		WAREHOUSE	-	-	-	-	-	14		347	4
	37	23007066	Central Kakaako				1,144				OFF ENCL WAREHSE	-	-	-	8	-	-		197	2
	37	23007066	Central Kakaako						6,608		WAREHOUSE	-	-	-	-	-	15		380	5
	37	23007067	Central Kakaako				910				OFF ENCL WAREHSE	-	-	-	6	-	-		157	2
	37	23007067	Central Kakaako						6,760		WAREHOUSE	-	-	-	-	-	16		388	5
	37	23007069	Central Kakaako				360				MEZZ ENCL OFFICE	-	-	-	2	-	-		62	1
	37	23007069	Central Kakaako				1,608				OFF ENCL WAREHSE	-	-	-	11	-	-		277	3
	37	23007069	Central Kakaako						32,137		WAREHOUSE	-	-	-	-	-	74		1,845	23
	37	23007078	Central Kakaako				2,577				OFFICES	-	-	-	18	-	-		444	6
	37	23007078	Central Kakaako						11,332		WAREHOUSE	-	-	-	-	-	26		651	8
	38	23007092	Central Kakaako							1,724	TAVERN/BAR	-	-	-	-	-	-	87	435	5
	38	23007093	Central Kakaako				5,385				OFFICES	-	-	-	37	-	-		928	12
	38	23007093	Central Kakaako							5,385	RESTAURANT	-	-	-	-	-	-	1616	8,080	101
	23	23007098	Kapiolani							2,030	RESTAURANT	-	-	-	-	-	-	609	3,045	38
	23	23007099	Kapiolani								PARK STRUCTURE	-	-	-	-	-	-	1	25	0
	23	23007100	Kapiolani				4,823				OFFICES	-	-	-	33	-	-		831	10
	23	23007107	Kapiolani				31,933				OFFICES	-	-	-	220	-	-		5,499	69
	23	23007107	Kapiolani								PARKING PAR/ENCL	-	-	-	-	-	-	1	25	0
	23	23007107	Kapiolani					19,864			RETAIL STORE	-	-	-	-	64	-		1,597	20
BLAISDELL CENTER	7B+C	23008002	Thomas Square								PARK STRUCTURE	-	-	-	-	-	-	1	25	0
	7B+C	23008003	Thomas Square							4,747	RESTAURANT	-	-	-	-	-	-	1425	7,125	89
MCKINLEY HIGH SCHOOL	7B+C	23009001	Thomas Square								SCHOOL	-	-	-	-	-	-	1800	45,000	563
	12	23010001	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	12	23010002	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	12	23010003	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	12	23010004	Sheridan		4						APARTMENT	-	12	-	-	-	-		960	12
	12	23010005	Sheridan		1						APARTMENT	-	3	-	-	-	-		240	3
	12	23010006	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	12	23010007	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	12	23010008	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
HAWAIIANA APTS	12	23010009	Sheridan		14						APARTMENT	-	40	-	-	-	-		3,200	40
RYCROFT MANOR	12	23010011	Sheridan		29						APARTMENT	-	82	-	-	-	-		6,560	82
	12	23010012	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	12	23010013	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	13	23010014	Sheridan		4						APARTMENT	-	12	-	-	-	-		960	12
	13	23010015	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	13	23010016	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	13	23010017	Sheridan		3						APARTMENT	-	9	-	-	-	-		720	9
	13	23010018	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	13	23010019	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	13	23010020	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	13	23010021	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	13	23010022	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	13	23010023	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	13	23010024	Sheridan		4						APARTMENT	-	12	-	-	-	-		960	12
	13	23010025	Sheridan		4						APARTMENT	-	12	-	-	-	-		960	12
	13	23010026	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	13	23010027	Sheridan		1						APARTMENT	-	3	-	-	-	-		240	3
MOANA PACIFIC	22	23010028	Kapiolani		1,404						APARTMENT	-	3,932	-	-	-	-		314,560	3,932
	13	23010083	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	13	23010092	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	13	23010093	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	13	23010094	Sheridan		3						APARTMENT	-	9	-	-	-	-		720	9
	13	23010096	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	13	23010097	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	13	23010098	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	12	23010099	Sheridan		1						APARTMENT	-	3	-	-	-	-		240	3
	12	23010100	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	12	23010101	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	12	23010102	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	12	23010103	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	12	23010104	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	12	23010105	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	12	23010106	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4

				Land Use: Existing Condition								Sewer								
Development Name	Block	TMK	HCDA Neighborhood	SF Residential	MF Residential	Hotel	Civic / Office	Commercial / Retail	General / Light Industry	Other	Use	SF Residential	MF Residential	Hotel	Civic / Office	Retail	General / Light Industry	Other	Average Flow	Equivalent Population
												4	2.8	2	300	140	100			
				units	units	units	SF	SF	SF	SF		cap/unit	cap/unit	cap/unit	cpa	cpa	cpa	cap	gpd	cap
	12	23010107	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
Honolulu Design Center	22	23010111	Kapiolani							19,751	RESTAURANT	-	-	-	-	-	-	5926	29,630	370
Honolulu Design Center	22	23010111	Kapiolani					60,112			RETAIL STORE	-	-	-	-	193	-		4,830	60
	10	23011002	Sheridan				460				LIBRARY	-	-	-	3	-	-		80	1
	10	23011002	Sheridan				969				MEZZ ENCL OFFICE	-	-	-	7	-	-		167	2
	10	23011002	Sheridan				2,766				OFFICES	-	-	-	19	-	-		477	6
	10	23011002	Sheridan							5,207	RELIGIOUS INST	-	-	-	-	-	-	36	900	11
	10	23011002	Sheridan							28,573	SCHOOL	-	-	-	-	-	-	358	8,950	112
	10	23011002	Sheridan				7,058				SOCIAL/FRATERNAL HALL	-	-	-	49	-	-		1,216	15
	8	23011003	Sheridan				955				OFFICES	-	-	-	7	-	-		165	2
	8	23011003	Sheridan					3,215			RETAIL STORE	-	-	-	-	10	-		259	3
	8	23011004	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	8	23011005	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	8	23011006	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	8	23011007	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	8	23011008	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	8	23011009	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	8	23011010	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	8	23011011	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	8	23011012	Sheridan								PARKING PAR/ENCL	-	-	-	-	-	-	1	25	0
	8	23011012	Sheridan					5,228			RETAIL STORE	-	-	-	-	17	-		421	5
	8	23011013	Sheridan					5,041			RETAIL STORE	-	-	-	-	16	-		406	5
	8	23011014	Sheridan					1,138			RETAIL STORE	-	-	-	-	4	-		92	1
	8	23011015	Sheridan				1,920				OFFICES	-	-	-	13	-	-		331	4
	8	23011015	Sheridan					1,441			RETAIL STORE	-	-	-	-	5	-		116	1
	8	23011016	Sheridan					2,400			RETAIL STORE	-	-	-	-	8	-		193	2
	8	23011017	Sheridan							1,650	RESTAURANT	-	-	-	-	-	-	495	2,475	31
	8	23011018	Sheridan				1,281				OFFICES	-	-	-	9	-	-		221	3
	8	23011018	Sheridan					3,294			RETAIL STORE	-	-	-	-	11	-		265	3
	8	23011019	Sheridan				2,500				OFFICES	-	-	-	17	-	-		431	5
	8	23011019	Sheridan					2,800			RETAIL STORE	-	-	-	-	9	-		225	3
	9	23011021	Sheridan		4						APARTMENT	-	12	-	-	-	-		960	12
	9	23011022	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	9	23011023	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	9	23011024	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
ELMS	9	23011025	Sheridan		63						APARTMENT	-	177	-	-	-	-		14,160	177
	9	23011029	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	9	23011030	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	9	23011031	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	9	23011032	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	9	23011033	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	9	23011034	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	9	23011035	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	9	23011036	Sheridan		1						APARTMENT	-	3	-	-	-	-		240	3
	9	23011037	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	11	23011038	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	11	23011039	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	11	23011040	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	11	23011041	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	11	23011042	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	11	23011043	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	11	23011044	Sheridan		4						APARTMENT	-	12	-	-	-	-		960	12
	10	23011045	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	10	23011046	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	10	23011047	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	10	23011048	Sheridan		4						APARTMENT	-	12	-	-	-	-		960	12
	10	23011049	Sheridan		2						APARTMENT	-	6	-	-	-	-		480	6
	10	23011050	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	10	23011051	Sheridan		4						APARTMENT	-	12	-	-	-	-		960	12
	11	23011053	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
	10	23011054	Sheridan	1							SF HOME	4	-	-	-	-	-		320	4
												180	25,864	-	14,127	3,644	5,000		**3,355,522**	**41,944**
												cap	cap	cap	cap	cap	cap		gpd	equiv
690 Pohukaina	46	21051041	Pauahi		851		19,000	76,000			APARTMENT	-	2,383	-	131	244	-		200,018	
Ward Entertainment Village	62 (HH 1)	23002104	Auahi																48000	

		Land Use: Future Base										Water						Sewer							
Block		MF Residential Units	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	Surface Parking SF	Garage Parking SF	MF Residential	Hotel	Civil / Office	Commercial	General / Light Industry	Average Day Flow	MF Residential	Hotel	Civil / Office	Retail	General / Light Industry	Average Flow	Equivalent Population
												400	350	69	69	92		2.8	2	300	140	100		
												gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gpd	cap/unit	cap/unit	cpa	cpa	cpa	gpd	cap
1	Civic Center	115	-	191,734	-	211,496	-	43,841	6,650	-	248,489	46,072	-	14,594	3,026	612	64,304	323	-	1,457	141	16	66,190	827
2	Civic Center	369	-	507,690	-	124,100	9,136	62,636	-	15,390	242,632	147,539	-	9,194	4,322	-	161,055	1,033	-	918	202	-	110,640	1,383
3	Civic Center	84	-	139,897	-	62,776	-	-	-	-	-	33,616	-	4,332	-	-	37,948	236	-	433	-	-	29,705	371
4	Civic Center	33	-	55,451	-	7,154	101,375	-	-	-	183,233	13,324	-	7,489	-	-	20,813	94	-	748	-	-	26,220	328
5	Civic Center	86	-	143,605	-	-	8,281	28,320	-	-	108,000	34,507	-	572	1,955	-	37,034	242	-	58	92	-	23,110	289
6		407						86,000				162,800			5,934		168,734	1,140			277		98,125	1,227
8	Sheridan	84	-	139,482	-	-	39,561	-	-	-	-	33,517	-	2,730	-	-	36,247	235	-	273	-	-	25,625	320
9	Sheridan	65	-	108,311	-	-	-	-	-	-	18,940	26,026	-	-	-	-	26,026	183	-	-	-	-	14,640	183
10	Sheridan	40	-	64,881	-	73,871	-	-	-	-	-	15,990	-	5,098	-	-	21,088	112	-	509	-	-	21,685	271
11	Sheridan	26	-	42,600	-	-	-	-	-	-	-	10,236	-	-	-	-	10,236	72	-	-	-	-	5,760	72
12	Sheridan	75	-	124,372	-	-	-	-	-	-	-	29,886	-	-	-	-	29,886	210	-	-	-	-	16,800	210
13	Sheridan	147	-	244,849	-	-	-	10,078	-	-	156,317	58,836	-	-	696	-	59,532	412	-	-	33	-	33,785	422
14	Kapiolani	1,270	-	1,061,528	-	-	66,593	10,500	-	-	622,220	508,000	-	4,595	725	-	513,320	3,556	-	459	34	-	296,805	3,710
15	Kapiolani	97	-	161,119	-	12,602	289,843	73,038	-	-	237,920	38,716	-	20,869	5,040	-	64,625	272	-	2,083	235	-	79,710	996
16	Kapiolani	-	-	-	-	41,898	245,254	-	-	-	-	-	-	19,814	-	-	19,814	-	-	1,978	-	-	49,450	618
17	Kapiolani	176	-	166,007	-	-	3,470	38,164	71,720	-	245,892	70,400	-	240	2,634	6,599	79,873	493	-	24	123	165	47,240	591
18	Kapiolani	126	-	210,194	-	-	-	52,498	-	-	-	50,508	-	-	3,623	-	54,131	354	-	-	169	-	32,545	407
19	Kapiolani	189	-	313,910	-	-	158,868	75,127	-	-	349,045	75,430	-	10,962	5,184	-	91,576	529	-	1,095	242	-	75,745	947
20	Kapiolani	1,088	-	1,197,305	-	-	134,663	64,609	-	-	655,518	435,320	-	9,292	4,459	-	449,071	3,048	-	928	208	-	272,240	3,403
21	Kapiolani	130	-	216,240	-	-	141,344	78,860	-	-	135,768	51,961	-	9,753	5,442	-	67,156	364	-	974	254	-	59,820	748
22	Kapiolani	1,404	-	-	-	-	-	87,604	-	-	-	561,600	-	-	6,045	-	567,645	3,932	-	-	282	-	321,610	4,020
23	Kapiolani	-	-	-	-	-	159,447	50,583	-	-	169,460	-	-	11,002	3,491	-	14,493	-	-	1,099	163	-	31,550	394
24	Central Kakaako	167	-	277,370	-	-	160,570	5,000	55,000	-	253,142	66,650	-	11,080	345	5,060	83,135	467	-	1,106	17	127	68,610	858
25	Central Kakaako	15	-	25,000	-	-	20,000	5,000	100,000	-	48,969	6,007	-	1,380	345	9,200	16,932	43	-	138	17	230	13,065	163
26	Central Kakaako	126	-	210,000	-	-	49,227	5,000	95,000	-	119,760	50,462	-	3,397	345	8,740	62,944	354	-	340	17	219	42,720	534
27	Central Kakaako	-	-	-	-	-	71,475	5,000	36,255	-	56,381	-	-	4,932	345	3,336	8,613	-	-	493	17	84	14,850	186
28	Central Kakaako	24	-	40,000	-	9,590	62,420	27,010	95,000	-	96,449	9,612	-	4,969	1,864	8,740	25,185	68	-	496	87	219	25,490	319
29	Central Kakaako	-	-	-	-	-	-	10,000	90,000	-	32,432	-	-	-	690	8,280	8,970	-	-	-	33	207	6,000	75
31	Central Kakaako	64	-	106,836	-	-	43,577	10,000	65,756	-	84,296	25,672	-	3,007	690	6,050	35,419	180	-	301	33	151	26,525	332
32	Central Kakaako	64	-	106,831	-	-	-	10,000	74,202	-	58,741	25,671	-	-	690	6,827	33,188	180	-	-	33	171	19,500	244
33	Central Kakaako	118	-	195,674	-	-	103,323	10,000	69,471	-	149,405	47,019	-	7,130	690	6,392	61,231	330	-	712	33	160	49,025	613
34	Central Kakaako	226	-	181,976	-	209,391	42,436	15,664	-	-	112,032	90,400	-	17,377	1,081	-	108,858	633	-	1,735	51	-	95,290	1,191
35	Central Kakaako	282	-	255,996	-	15,760	31,680	5,960	-	-	-	112,800	-	3,274	412	-	116,486	790	-	327	20	-	71,875	898
36	Central Kakaako	305	-	507,952	-	-	-	20,000	-	-	159,643	122,057	-	-	1,380	-	123,437	855	-	-	65	-	70,025	875
37	Central Kakaako	110	-	182,953	-	-	-	25,253	-	-	69,091	43,962	-	-	1,743	-	45,705	308	-	-	82	-	26,690	334
38	Central Kakaako	-	-	-	-	-	187,361	5,000	62,454	-	-	-	-	12,928	345	5,746	19,019	-	-	1,291	17	144	36,300	454
39	Central Kakaako	-	-	-	-	-	200,000	5,000	90,000	-	157,666	-	-	13,800	345	8,280	22,425	-	-	1,378	17	207	40,050	501
40	Pauahi	353	-	-	-	-	-	8,607	-	-	-	141,200	-	-	594	-	141,794	989	-	-	28	-	79,820	998
41	Pauahi	154	-	257,090	-	-	30,291	43,212	-	-	124,256	61,777	-	2,091	2,982	-	66,850	433	-	209	139	-	43,340	542
42	Pauahi	110	-	182,988	-	-	317,986	79,025	-	-	264,000	43,971	-	21,942	5,453	-	71,366	308	-	2,190	254	-	85,740	1,072
43	Pauahi	280	-	340,555	-	-	70,065	32,933	-	-	224,515	111,897	-	4,835	2,273	-	119,005	784	-	483	106	-	77,445	968
44	Pauahi	214	-	356,900	-	-	-	41,999	-	-	236,406	85,761	-	-	2,898	-	88,659	601	-	-	135	-	51,455	643
46	Pauahi	1,054	-	-	-	-	19,000	76,000	-	-	471,580	421,600	-	1,311	5,244	-	428,155	2,952	-	131	245	-	245,560	3,070
47	Pauahi	-	-	-	-	947	-	-	-	-	-	-	-	66	-	-	66	-	-	7	-	-	175	2
51	Pauahi	-	-	-	-	-	632,055	237,265	-	-	-	-	-	43,612	16,372	-	59,984	-	-	4,353.00	763.00	-	127,900	1,599
53	Pauahi	153	-	254,312	-	-	307,424	77,606	-	-	392,795	61,109	-	21,213	5,355	-	87,677	428	-	2,118	250	-	93,440	1,168
57	Pauahi	467	-	-	-	-	-	12,987	-	-	-	186,800	-	-	897	-	187,697	1,308	-	-	42	-	105,690	1,321
58	Pauahi	159	-	264,061	-	-	200,005	44,400	-	-	298,740	63,452	-	13,801	3,064	-	80,317	445	-	1,378	143	-	73,625	920
59	Pauahi	149	-	247,483	-	-	146,224	36,556	-	-	173,530	59,468	-	10,090	2,523	-	72,081	417	-	1,008	118	-	61,510	769
60	Pauahi	121	-	201,120	-	-	136,525	27,301	-	-	208,008	48,328	-	9,419	1,884	-	59,631	339	-	941	88	-	52,845	661
61	Pauahi	185	-	308,025	-	-	250,655	50,131	-	-	386,364	74,016	-	17,296	3,460	-	94,772	519	-	1,727	162	-	88,745	1,109
30R	Central Kakaako	458	-	596,548	-	-	-	10,000	-	-	230,965	183,155	-	-	690	-	183,845	1,283	-	-	33	-	103,465	1,293
45 (KS A)	Pauahi	632	-	-	-	-	-	41,999	-	-	-	252,800	-	-	2,898	-	255,698	1,770	-	-	135	-	144,975	1,812
48N (not HH)	Pauahi	322	-	535,238	-	-	169,686	111,343	-	-	184,845	128,614	-	11,709	7,683	-	148,006	901	-	1,169	358	-	110,255	1,378
52 (KS B)	Pauahi	183	-	-	-	-	-	9,680	-	-	-	73,200	-	-	668	-	73,868	513	-	-	32	-	41,940	523
52X	Pauahi	306	-	-	-	-	-	-	-	-	-	122,400	-	-	-	-	122,400	857	-	-	-	-	68,560	857
54 (KS C)	Pauahi	332	-	552,031	-	-	8,767	61,366	17,533	-	225,013	132,649	-	605	4,235	1,614	139,103	929	-	61	198	41	81,820	1,023
55 (KS D)	Pauahi	118	-	196,781	-	-	8,610	60,270	17,220	-	122,212	47,285	-	595	4,159	1,585	53,624	331	-	60	194	40	33,830	423
63E	Auahi	2,163	-	-	-	-	105,922	15,528	-	-	-	865,200	-	7,309	1,072	-	873,581	6,057	-	730	50	-	504,060	6,301
62 (HH 1)																								17,114
63H (HH 3)		Development information not available. Peak flows provided by Howard Hughes Group. Equivalent population derived assuming 35 gpcd DW I/I, 2750 gad WW I/I.																						858
64 (HH 2)																								4,344
65 (HH 4)																								2,250
6Kap	Kapiolani	38	-	-	-	-	-	3,616	-	-	-	15,200	-	-	250	-	15,450	107	-	-	12	-	8,860	111
6TS	Thomas Square	1,353	-	1,934,557	-	-	461,758	328,971	-	-	1,218,949	541,378	-	31,862	22,699	-	595,939	3,790	-	3,181	1,058	-	409,175	5,115
7B+C	Thomas Square	761	-	1,266,626	-	441,585	1,127,010	325,734	-	-	1,377,096	304,361	-	108,234	22,476	-	435,071	2,131	-	10,803	1,047	-	466,730	5,834
HH 5		Development information not available. Peak flows provided by Howard Hughes Group. Equivalent population derived assuming 35 gpcd DW I/I, 2750 gad WW I/I.																						16,119
												7,030,220	-	519,800	183,715	87,061	**7,820,796**	49,240	-	51,902	8,584	2,181	**5,505,875**	**109,508**
												gpd	gpd	gpd	gpd	gpd	gpd	cap	cap	cap	cap	cap	gpd	equiv cap

Residential Ui	Hotel Units	Residential SF	Hotel SF	Civic SF	Office SF	Retail SF	Industrial SF	Surface Parki SF	Garage Parkir SF	MF Residentia	Hotel	Civil / Office	Commercial	General / Ligh Industry	Average Daily Flow	MF Residentia	Hotel	Civil / Office
										400	350	69	69	92		2.8	2	300
										gal/unit	gal/unit	gal/1000 sf	gal/1000 sf	gal/1000 sf	gpd	cap/unit	cap/unit	cpa
115	-	191,734	-	211,496	-	43,841	6,650	-	248,489	46,072	-	14,594	3,026	612	64,304	323	-	1,457
369	-	507,690	-	124,100	9,136	62,636	-	15,390	242,632	147,539	-	9,194	4,322	-	161,055	1,033	-	918
84	-	139,897	-	62,776	-	-	-	-	-	33,616	-	4,332	-	-	37,948	236	-	433
33	-	55,451	-	7,154	101,375	-	-	-	183,233	13,324	-	7,489	-	-	20,813	94	-	748
86	-	143,605	-	-	8,281	28,320	-	-	108,000	34,507	-	572	1,955	-	37,034	242	-	58
407						86,000				162,800			5,934		168,734	1,140		
84	-	139,482	-	-	39,561	-	-	-	-	33,517	-	2,730	-	-	36,247	235	-	273
65	-	108,311	-	-	-	-	-	-	18,940	26,026	-	-	-	-	26,026	183	-	-
40	-	64,881	-	73,871	-	-	-	-	-	15,990	-	5,098	-	-	21,088	112	-	509
26	-	42,600	-	-	-	-	-	-	-	10,236	-	-	-	-	10,236	72	-	-
75	-	124,372	-	-	-	-	-	-	-	29,886	-	-	-	-	29,886	210	-	-
147	-	244,849	-	-	-	10,078	-	-	156,317	58,836	-	-	696	-	59,532	412	-	-
1,270	-	1,061,528	-	-	66,593	10,500	-	-		508,000	-	4,595	725	-	513,320	3,556	-	459
406	-	675,024	-	-	277,798	13,703	-	-	391,728	162,204	-	19,169	946	-	182,319	1,136	-	1,914
-	-	-	-	41,898	245,254	-	-	-	-	-	-	19,814	-	-	19,814	-	-	1,978
176	-	166,007	-	-	3,470	38,164	71,720	-	245,892	70,400	-	240	2,634	6,599	79,873	493	-	24
126	-	210,194	-	-	-	52,498	-	-	-	50,508	-	-	3,623	-	54,131	354	-	-
449	-	748,181	-	-	319,088	14,732	-	-	337,200	179,783	-	22,018	1,017	-	202,818	1,259	-	2,198
1,088	-	1,197,305	-	-	134,663	64,609	-	-	655,518	435,320	-	9,292	4,459	-	449,071	3,048	-	928
452	-	751,729	-	-	36,172	20,539	-	-	262,478	180,635	-	2,496	1,418	-	184,549	1,265	-	250
1,404	-		-	-	-	87,604	-	-	358,508	561,600	-	-	6,045	-	567,645	3,932	-	-
-	-	-	-	-	159,447	50,583	-	-	169,460	-	-	11,002	3,491	-	14,493	-	-	1,099
167	-	277,370	-	-	160,570	5,000	55,000	-	253,142	66,650	-	11,080	345	5,060	83,135	467	-	1,106
15	-	25,000	-	-	20,000	5,000	100,000	-	48,969	6,007	-	1,380	345	9,200	16,932	43	-	138
126	-	210,000	-	-	49,227	5,000	95,000	-	119,760	50,462	-	3,397	345	8,740	62,944	354	-	340
-	-	-	-	-	71,475	5,000	36,255	-	56,381	-	-	4,932	345	3,336	8,613	-	-	493
24	-	40,000	-	9,590	62,420	27,010	95,000	-	96,449	9,612	-	4,969	1,864	8,740	25,185	68	-	496
-	-	-	-	-	-	10,000	90,000	-	32,432	-	-	-	690	8,280	8,970	-	-	-
64	-	106,836	-	-	43,577	10,000	65,756	-	84,296	25,672	-	3,007	690	6,050	35,419	180	-	301
135	-	224,156	-	-	-	10,000	74,202	-	58,741	53,863	-	-	690	6,827	61,380	378	-	-
118	-	195,674	-	-	103,323	10,000	69,471	-	149,405	47,019	-	7,130	690	6,392	61,231	330	-	712
226	-	181,976	-	209,391	42,436	15,664	-	-	112,032	90,400	-	17,377	1,081	-	108,858	633	-	1,735
282	-		-	15,760	31,680	5,960	-	-	98,186	112,800	-	3,274	412	-	116,486	790	-	327
448	-	745,064	-	-	39,307	13,156	-	-	361,100	179,034	-	2,713	908	-	182,655	1,254	-	271
223	-	371,548	-	-	8,967	10,136	-	-	116,180	89,280	-	619	700	-	90,599	625	-	62
287	-	477,788	-	-	-	30,395	-	-	205,701	114,809	-	-	2,098	-	116,907	804	-	-
205	-	341,415	-	-	5,202	12,771	-	-	199,198	82,040	-	359	882	-	83,281	575	-	36
353	-		-	-	-	8,607	-	-		141,200	-	-	594	-	141,794	989	-	-
431	-	716,632	-	-	44,877	23,143	-	-	245,500	172,202	-	3,097	1,597	-	176,896	1,206	-	310
603	-	1,003,023	-	-	284,997	62,069	-	-	569,800	241,019	-	19,665	4,283	-	264,967	1,688	-	1,963
388	-	520,660	-	-	90,054	18,011	-	-	269,640	155,175	-	6,214	1,243	-	162,632	1,087	-	621
407	-	678,300	-	-	59,850	27,385	-	-	323,300	162,991	-	4,130	1,890	-	169,011	1,141	-	413
1,054	-	927,244	-	-	19,000	76,000	-	-	471,580	421,600	-	1,311	5,244	-	428,155	2,952	-	131
-	-	-	-	947	-	-	-	-	-	-	-	66	-	-	66	-	-	7
-	-	-	-	-	632,055	237,265	-	-	-	-	-	43,612	16,372	-	59,984	-	-	4,353
802	-	1,334,747	-	-	125,844	29,111	-	-	387,280	320,730	-	8,684	2,009	-	331,423	2,246	-	867
467	-	-	-	-	-	12,987	-	-	-	186,800	-	-	897	-	187,697	1,308	-	-
159	-	264,061	-	-	200,005	44,400	-	-	298,740	63,452	-	13,801	3,064	-	80,317	445	-	1,378
149	-	247,483	-	-	146,224	36,556	-	-	173,530	59,468	-	10,090	2,523	-	72,081	417	-	1,008
121	-	201,120	-	-	136,505	27,301	-	-	208,008	48,328	-	9,419	1,884	-	59,631	339	-	941
185	-	308,025	-	-	250,655	50,131	-	-	386,364	74,016	-	17,296	3,460	-	94,772	519	-	1,727
458	-	596,548	-	-	-	10,000	-	-	230,965	183,155	-	-	690	-	183,845	1,283	-	-
632	-		-	-		41,999		-		252,800	-	-	2,898	-	255,698	1,770	-	-
370	-	615,798	-	-	56,466	22,800	-	-	180,000	147,972	-	3,897	1,574	-	153,443	1,036	-	389
183	-	-	-	-		9,680		-		73,200	-	-	668	-	73,868	513	-	-
306	-		-	-	-	-	-	-		122,400	-	-	-	-	122,400	857	-	-
685	-	1,140,787	-	-	31,238	218,669	62,477	-	421,692	274,123	-	2,156	15,089	5,748	297,116	1,919	-	216
292	-	485,581	-	-	29,730	208,110	59,460	-	253,018	116,682	-	2,052	14,360	5,471	138,565	817	-	205
2,163	-		-	-	105,922	15,528	-	-		865,200	-	7,309	1,072	-	873,581	6,057	-	730

Development information not available. Peak flows reported by Howard Hughes Group. Equivalent population derived 35 gpcd DW I/I, 2750 gad WW I/I.

38	-		-	-	-	3,616	-	-	-	15,200	-	-	250	-	15,450	107	-	-
2,435	-	3,741,772	-	-	312,654	242,236	-	-	1,512,092	974,142	-	21,574	16,715	-	1,012,431	6,819	-	2,154
1,143	434	1,901,977	204,000	582,670	8,720	236,574	-	-	798,212	457,032	151,900	40,806	16,324	-	666,062	3,200	868	4,073

Table 5: Flow Computation - Existing Condition

Discharge SMH	Average Flow (mgd)	Dry Weather I/I (mgd)	Design Average Flow (mgd)
340032	0.0025	0.0011	0.0069
340260	0.0341	0.0149	0.0955
340287	0.0061	0.0027	0.0171
340479	0.0051	0.0022	0.0142
340496	0.0196	0.0086	0.0549
340497	0.0178	0.0078	0.0499
340578	0.0082	0.0036	0.0230
340654	0.2458	0.1075	0.6882
340663	0.0113	0.0050	0.0317
340746	0.0005	0.0002	0.0013
340787	0.0001	0.0001	0.0004
340801	0.0007	0.0003	0.0020
340822	0.0000	0.0000	0.0000
340995	0.0005	0.0002	0.0014
341082	0.0283	0.0124	0.0793
341034	0.0012	0.0005	0.0034
341127	0.0011	0.0005	0.0030
341183	0.0667	0.0292	0.1868
341308	0.0056	0.0025	0.0157
341331	0.1450	0.0634	0.4059
341339	0.0594	0.0260	0.1664
341360	0.0006	0.0003	0.0018
341402	0.0041	0.0018	0.0114
341407	0.0522	0.0228	0.1462
341418	0.0359	0.0157	0.1004
341438	0.0215	0.0094	0.0601
341491	0.0010	0.0004	0.0028
341498	0.0046	0.0020	0.0128
341527	0.2011	0.0880	0.5629
341557	0.0031	0.0014	0.0087
341588	0.0072	0.0031	0.0200
341601	0.0000	0.0000	0.0000
341619	0.0081	0.0036	0.0228
341634	0.0107	0.0047	0.0300
341656	0.0000	0.0000	0.0000
341660	0.0005	0.0002	0.0015
341729	0.0002	0.0001	0.0005
341730	0.0009	0.0004	0.0025
341764	0.0104	0.0046	0.0292

Table 5: Flow Computation - Existing Condition

Discharge SMH	Average Flow (mgd)	Dry Weather I/I (mgd)	Design Average Flow (mgd)
341787	0.0050	0.0022	0.0140
341803	0.0002	0.0001	0.0006
341812	0.0014	0.0006	0.0040
341826	0.0006	0.0003	0.0017
341852	0.0361	0.0158	0.1011
341934	0.0047	0.0021	0.0132
341945	0.0031	0.0013	0.0086
341967	0.0100	0.0044	0.0281
341970	0.0106	0.0046	0.0296
341976	0.0179	0.0078	0.0501
342026	0.0038	0.0017	0.0106
342039	0.0032	0.0014	0.0090
342049	0.0017	0.0007	0.0046
342056	0.0014	0.0006	0.0039
342081	0.0015	0.0007	0.0042
342093	0.0025	0.0011	0.0070
342111	0.0644	0.0282	0.1804
342114	0.0014	0.0006	0.0038
342145	0.0037	0.0016	0.0104
342150	0.0033	0.0014	0.0092
342154	0.0007	0.0003	0.0021
342162	0.0024	0.0011	0.0067
342199	0.0006	0.0003	0.0017
342202	0.0046	0.0020	0.0130
342207	0.0008	0.0004	0.0024
342208	0.0027	0.0012	0.0076
342210	0.0020	0.0009	0.0057
342248	0.0006	0.0002	0.0016
342249	0.0024	0.0010	0.0067
342258	0.0163	0.0071	0.0455
342261	0.0037	0.0016	0.0104
342283	0.0088	0.0039	0.0247
342308	0.0005	0.0002	0.0014
342348	0.0020	0.0009	0.0057
342353	0.0025	0.0011	0.0069
342356	0.0042	0.0018	0.0117
342357	0.0092	0.0040	0.0256
342367	0.0018	0.0008	0.0050
342385	0.0024	0.0010	0.0066

Table 5: Flow Computation - Existing Condition

Discharge SMH	Average Flow (mgd)	Dry Weather I/I (mgd)	Design Average Flow (mgd)
342394	0.0030	0.0013	0.0083
342402	0.0096	0.0042	0.0270
351789	0.0085	0.0037	0.0238
352086	0.0194	0.0085	0.0542
352390	0.0077	0.0034	0.0215
352759	0.0010	0.0004	0.0027
352769	0.0118	0.0052	0.0330
352864	0.0078	0.0034	0.0220
352940	0.0019	0.0008	0.0054
352972	0.0067	0.0029	0.0188
379475	0.0004	0.0002	0.0011
379729	0.0003	0.0001	0.0008
379737	0.0042	0.0018	0.0117
379754	0.0030	0.0013	0.0084
379756	0.0038	0.0017	0.0107
379764	0.0029	0.0013	0.0082
379765	0.0026	0.0011	0.0073
379771	0.0057	0.0025	0.0160
379782	0.0450	0.0197	0.1260
379810	0.0087	0.0038	0.0245
379812	0.0084	0.0037	0.0234
379870	0.0001	0.0000	0.0003
379875	0.0067	0.0029	0.0189
379894	0.0048	0.0021	0.0135
379904	0.0016	0.0007	0.0045
379943	0.0042	0.0018	0.0117
379948	0.0005	0.0002	0.0014
379950	0.0112	0.0049	0.0314
380002	0.0121	0.0053	0.0339
380025	0.0036	0.0016	0.0100
380104	0.0046	0.0020	0.0128
380113	0.0124	0.0054	0.0348
380133	0.0018	0.0008	0.0051
380189	0.0005	0.0002	0.0013
380234	0.0007	0.0003	0.0021
380249	0.0013	0.0006	0.0035
380351	0.0095	0.0041	0.0265
380404	0.0791	0.0346	0.2215
381340	0.0106	0.0047	0.0298

Table 5: Flow Computation - Existing Condition

Discharge SMH	Average Flow (mgd)	Dry Weather I/I (mgd)	Design Average Flow (mgd)
381642	0.0000	0.0000	0.0000
381994	0.0117	0.0051	0.0328
382153	0.0064	0.0028	0.0179
384244	0.0004	0.0002	0.0011
683634	0.0133	0.0058	0.0373
683689	0.0980	0.0429	0.2744
683693	0.0011	0.0005	0.0031
683714	0.0051	0.0022	0.0141
683750	0.0002	0.0001	0.0005
683760	0.0005	0.0002	0.0014
683865	0.0000	0.0000	0.0000
683899	0.0058	0.0026	0.0164
683930	0.0016	0.0007	0.0046
683960	0.0055	0.0024	0.0155
684074	0.1090	0.0477	0.3052
684110	0.0019	0.0008	0.0053
684192	0.0018	0.0008	0.0052
684209	0.0056	0.0025	0.0158
684321	0.0010	0.0005	0.0029
1004956	0.0044	0.0019	0.0122
2023413	0.0562	0.0246	0.1575
3010699	0.0059	0.0026	0.0165
3010701	0.0004	0.0002	0.0010
3010712	0.0004	0.0002	0.0012
3013634	0.0041	0.0018	0.0114
3420121	0.0004	0.0002	0.0011
4013626	0.0011	0.0005	0.0032
4013730	0.0742	0.0324	0.2076
4013760	0.1779	0.0778	0.4982
4014276	0.0112	0.0049	0.0314

Table 5: Flow Computation - Existing Condition

Discharge SMH	Average Flow (mgd)	Dry Weather I/I (mgd)	Design Average Flow (mgd)
4014278	0.0480	0.0210	0.1344
4020187	0.0016	0.0007	0.0044
4020189	0.0043	0.0019	0.0120
4025647	0.0772	0.0338	0.2160
4025653	0.0030	0.0013	0.0085
4026536	0.0004	0.0002	0.0012
4026538	0.0010	0.0004	0.0027
4026546	0.0036	0.0016	0.0100
4026564	0.0005	0.0002	0.0014
4026568	0.0166	0.0073	0.0466
4026586	0.0024	0.0010	0.0067
4026599	0.0016	0.0007	0.0044
4038809	0.0654	0.0286	0.1831
4038813	0.0864	0.0378	0.2419
4046385	0.0632	0.0277	0.1770
4047055	0.0012	0.0005	0.0032
4047061	0.0030	0.0013	0.0085
4047071	0.0015	0.0007	0.0042
4055477	0.0798	0.0349	0.2235
4065246	0.0345	0.0151	0.0965
4065260	0.3146	0.1376	0.8807
4065989	0.0521	0.0228	0.1458
4070282	0.1146	0.0502	0.3210
4070522	0.0205	0.0090	0.0574
4073046	0.0089	0.0039	0.0248
4038817	0.0164	0.0072	0.0459
4075372	0.1104	0.0483	0.3091
4075957	0.0016	0.0007	0.0044
4075961	0.0011	0.0005	0.0031
4075964	0.0001	0.0000	0.0003
4076088	0.0110	0.0048	0.0309
4079921	0.0043	0.0019	0.0119
4079929	0.0477	0.0209	0.1336
	3.3978 <- Avg Flow		
	42472 <- Equivalent Population		
	2.362377 <- Flow Factor		
690 Pohukaina			
683930	0.2000	0.0875	0.6792

Table 6: Flow Computation -Future Baseline and TOD Alternative A

	Future Baseline			TOD Overlay		
Discharge SMH	Average	DWII	Design Max	Average	DWII	Design Max
339739			12676.0			12676.0
340340			1945.2			1945.2
340475			617037.2			617037.2
340482	5947.0	2601.8	15692.6	5947.0	2601.8	15224.6
340496			395538.0			395538.0
340578	15236.0	6665.8	40203.8	15236.0	6665.8	39004.9
340654	245786.0	107531.4	648564.3	245786.0	107531.4	629224.5
340787			50261.2			50261.2
340789	99923.0	43716.3	263670.4	99923.0	43716.3	255807.9
340822	23110.0	10110.6	60981.2	23110.0	10110.6	59162.8
341080			15963860.0			15963860.0
341082			30241.4			30241.4
341183	118343.0	51775.1	312275.9	118343.0	51775.1	302964.0
341263	41182.0	18017.1	108668.4	41182.0	18017.1	105428.0
341270			78134.3			78134.3
341283			40632.5			40632.5
341331	144975.0	63426.6	382550.7	144975.0	63426.6	371143.3
341498	130670.0	57168.1	344803.6	130670.0	57168.1	334521.7
341557	94795.0	41472.8	250139.0	209935.0	91846.6	537444.1
341588	466730.0	204194.4	1231577.1	446290.0	195251.9	1142524.8
341599	24785.0	10843.4	65401.1	56705.0	24808.4	145167.6
341625	75745.0	33138.4	199871.0	156870.0	68630.6	401595.1
341787	68210.0	29841.9	179988.2	68210.0	29841.9	174621.0
341794	175.0	76.6	461.8	175.0	76.6	448.0
341797	76675.0	33545.3	202325.1	244526.0	106980.1	625998.8
341798	98125.0	42929.7	258925.9	98125.0	42929.7	251204.9
341852	68610.0	30016.9	181043.7	68610.0	30016.9	175645.0
341964	93440.0	40880.0	246563.5	203705.0	89120.9	521495.0
342056	32599.0	14262.1	86020.1	32599.0	14262.1	83455.1
342088	13065.0	5715.9	34475.1	13065.0	5715.9	33447.1
342157	14850.0	6496.9	39185.2	14850.0	6496.9	38016.7
342161	110255.0	48236.6	290933.8	94455.0	41324.1	241809.5
342244	6000.0	2625.0	15832.4	6000.0	2625.0	15360.3
342402	144085.0	63037.2	380202.2	90635.0	39652.8	232030.1
351590			9054.1			9054.1
351869			622276.6			622276.6
352389	40265.0	17615.9	106248.7	40265.0	17615.9	103080.4
352864	21685.0	9487.2	57221.0	21685.0	9487.2	55514.7
352864	5760.0	2520.0	15199.1	5760.0	2520.0	14745.9
352864	27445.0	12007.2	72420.1	27445.0	12007.2	70260.6
352912			4597681.0			4597681.0
352965	33785.0	14780.9	89149.7	33785.0	14780.9	86491.3
353106	16800.0	7350.0	44330.8	16800.0	7350.0	43008.8
379476			4932.2			4932.2
379736	88745.0	38825.9	234174.6	88745.0	38825.9	227191.6
379795	19500.0	8531.3	51455.3	35340.0	15461.3	90472.2
379830	27847.0	12183.1	73480.9	27847.0	12183.1	71289.7
379875	59820.0	26171.3	157849.2	109125.0	47742.2	279365.5
380047	36300.0	15881.3	95786.1	66770.0	29211.9	170934.5
380133	26690.0	11676.9	70427.9	52375.0	22914.1	134082.6
380254	70025.0	30635.9	184777.5	108170.0	47324.4	276920.6
380398	114631.0	50151.1	302480.9	114631.0	50151.1	293461.1
380402			24201320.0			24201320.0
380962			3630.0			3630.0
381780	31550.0	13803.1	83252.1	31550.0	13803.1	80769.6
382153	40050.0	17521.9	105681.4	47950.0	20978.1	122754.4
683689	**97988.0**	**42869.8**	258564.4	**97988.0**	**42869.8**	250854.2
683693	47626.0	20836.4	125672.4	47626.0	20836.4	121924.9
683930	245560.0	107432.5	647967.9	245560.0	107432.5	628645.9
684015	41840.0	18305.0	110404.7	41840.0	18305.0	107112.5
684074	105690.0	46239.4	278888.0	105690.0	46239.4	270571.7
684110	73625.0	32210.9	194276.9	73625.0	32210.9	188483.7
684244	81820.0	35796.3	215901.4	180095.0	78791.6	461052.2

Table 6: Flow Computation -Future Baseline and TOD Alternative A

	Future Baseline			TOD Overlay		
Discharge SMH	Average	DWII	Design Max	Average	DWII	Design Max
684291	61510.0	26910.6	162308.6	61510.0	26910.6	157468.7
684321	52845.0	23119.7	139444.0	52845.0	23119.7	135285.8
3010712	56506.0	24721.4	149104.4	56506.0	24721.4	144658.2
4020189	51455.0	22511.6	135776.1	103830.0	45425.6	265810.0
4025647	55249.0	24171.4	145787.5	55249.0	24171.4	141440.2
4026534	85740.0	37511.3	226245.2	189115.0	82737.8	484143.9
4026568	16635.0	7277.8	43895.4	16635.0	7277.8	42586.4
4026599	79710.0	34873.1	210333.6	139855.0	61186.6	358035.8
4047061	8675.0	3795.3	22891.0	8675.0	3795.3	22208.4
4055477	79812.0	34917.8	210602.8	79812.0	34917.8	204322.7
4065260	314560.0	137620.0	830040.7	314560.0	137620.0	805289.4
4065985			6336451.0			6336451.0
4065988	26525.0	11604.7	69992.5	26525.0	11604.7	67905.3
4070522	77445.0	33882.2	204356.9	103935.0	45471.6	266078.8
4073046	8851.0	3872.3	23355.4	8851.0	3872.3	22659.0
4075961	49025.0	21448.4	129364.0	49025.0	21448.4	125506.5
4075963	100356.0	43905.8	264813.0	100356.0	43905.8	256916.4
9000001						
9000002						
9000003						
9000004						
9000005						
9000006						
9000007						
9000008						
9000009						
9000010						
9000011						
9000012						
9000013						
9000014						
9000015						
9000016						
48N	110255.0	48236.6	290933.8	94455.0	41324.1	241809.5
55 (KSD)	33830.0	14800.6	89268.4	90636.0	39653.3	232032.7
	60466.8	<- equiv population		72537.1	<- equiv population	
	2.2	<- flow factor		2.1	<- flow factor	

HHG provided peak flow values only. These values were assigned directly at each discharge manhole.