Kakaako Community Development District

Makai Area Plan Amendment

Final Environmental Assessment

Prepared for:
Hawaii Community Development Authority

Prepared by:
Wilson Okamoto Corporation

July 2005

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PREFACE

This Environmental Assessment (EA) has been prepared in accordance with the requirements of Chapter 343, Hawaii Revised Statutes (HRS) for proposed amendments to the Kakaako Community Development District Makai Area Plan. The Hawaii Community Development Authority (HCDA) wishes to amend the Makai Area Plan by reclassifying lands designated as “Commercial” to “Mixed-Use” to permit residential use and to increase the height limit at the Waterfront Commercial zone near Kewalo Basin from 45 feet to 65 feet.

Pursuant to Chapter 343, HRS, the project requires compliance with environmental assessment requirements based on the use of State lands and funds. This EA has been processed as a Finding of No Significant Impact (FONSI) as no significant impacts are anticipated to result from the proposed amendments.

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PROJECT SUMMARY

Proposing Agency:	Hawaii Community Development Authority, State of Hawaii 677 Ala Moana Boulevard, Suite 1001 Honolulu, Hawaii 96813 Contact: Mr. Daniel Dinell, Executive Director
Approving Agency:	Hawaii Community Development Authority, State of Hawaii
Determination:	Finding of No Significant Impact
Tax Map Keys:	2-1-15, 2-1-58, 2-1-59, 2-1-60 (all parcels)
Land Area:	Approximately 221 acres
Location:	Kakaako Makai Area, Honolulu, Hawaii
Landowners:	Hawaii Community Development Authority Federal Government Kamehameha Schools Hawaiian Electric Company
Existing Uses:	Maritime industrial cargo and warehousing, light industrial, public facility, commercial offices, park/recreational, marina berths, maritime support operations, marine research, restaurants, university.
State Land Use:	Urban, Conservation (coastal waters)
Proposed Action:	Amend the Makai Area Plan and Rules by reclassifying lands designated as "Commercial" to a "Mixed-Use Zone" where residential use will be permitted. Amend the Makai Area Rules to allow residential use in the "Waterfront Commercial" zone. Increase the height limit in the Waterfront Commercial zone at the west end of Kewalo Basin from 45 feet to 65 feet.
Pre-Consultation Consulted Parties:	<u>State of Hawaii</u> Department of Health Department of Land and Natural Resources Department of Transportation Office of Planning

City and County of Honolulu
Board of Water Supply
Department of Planning & Permitting
Department of Transportation Services
Ala Moana/Kakaako Neighborhood Board No. 11

Other
Kakaako Improvement Association
Kamehameha Schools

Draft EA Consulted Parties:

Federal Government
U.S. Fish and Wildlife Service
National Marine Fisheries Service
U.S. Army Corps of Engineers

State of Hawaii
Department of Business, Economic Development and Tourism
Department of Education
Department of Health (DOH)
DOH, Environmental Management Division
DOH, Office of Environmental Quality Control
Department of Land and Natural Resources (DLNR)
DLNR, Historic Preservation Division
Department of Transportation
Office of Hawaiian Affairs
Office of Planning
University of Hawaii, Environmental Center

City and County of Honolulu
Board of Water Supply
Department of Planning & Permitting
Department of Transportation Services
Ala Moana/Kakaako Neighborhood Board No. 11

Other
State Main Library
Hawaiian Electric Company, Inc.
Kakaako Improvement Association
Kamehameha Schools
Hawaiian Telecom
Oceanic Cablevision

Final EA
Distribution:

<u>State of Hawaii</u>
Department of Business, Economic Development and Tourism
Department of Education
Department of Health (DOH)
DOH, Office of Environmental Quality Control
Department of Transportation
Office of Hawaiian Affairs
Office of Planning
State Main Library
State Senator Gordon Trimble

<u>City and County of Honolulu</u>
Board of Water Supply
Department of Parks and Recreation
Department of Planning & Permitting
Department of Transportation Services
Ala Moana/Kakaako Neighborhood Board No. 11

<u>Other</u>
Kakaako Improvement Association

1 INTRODUCTION

1.1 Purpose and Need for the Environmental Assessment

The Hawaii Community Development Authority (HCDA) proposes to amend the Kakaako Makai Area Plan and Rules ("Plan and Rules") to allow residential use in the Kakaako Makai Area. The Kakaako Makai Area Plan, which was last revised in 1998, sets forth the development objectives and rationale for the orderly redevelopment of the Kakaako Community Development District's Makai Area.

In accordance with Chapter 343, Hawaii Revised Statutes, the HCDA has determined that an Environmental Assessment should be prepared for the proposed amendments to the Makai Area Plan and Rules. The original Environmental Impact Statement (EIS) for the overall Kakaako Community Development District was prepared in 1983. A separate Makai Area Plan was adopted by the HCDA in 1983 and supplemental EIS's were prepared for the Makai Area Plan in 1985, 1990, 1994, and 1998. The 1994 Final Supplemental EIS assessed the inclusion of residential use in the Makai Area, however, the proposed 1994 Makai Area Plan was not adopted by the HCDA.

1.2 Background

The Kakaako Community Development District, originally established by the Hawaii Legislature in 1976, has been divided into a Mauka Area and a Makai Area. The Mauka Area is bounded by Punchbowl Street, King Street, Piikoi Street and Ala Moana Boulevard. The Makai Area, as originally established in 1982, included approximately 133 acres extending Makai of Ala Moana Boulevard between Kewalo Basin and Pier 4. In its 1985 revision to the Kakaako Makai Area Plan, the HCDA addressed the following concerns unique to the Makai Area:

- Recognition of harbor uses at the Fort Armstrong area;
- A central residential area;
- The preservation of scenic views;
- A 30-acre proposed waterfront park at the end of the Kakaako peninsula, and;
- The Makai Area as a potential relocation site for displaced Kakaako Mauka Area businesses.

In 1987, the State Legislature expanded the Makai Area boundaries to include all lands Makai of Ala Moana Boulevard from Ala Moana Park to Aloha Tower, expanding the Makai Area from 133 acres to 227 acres. In 1990, however, the lands between Piers 4 and 8 were reassigned to the Aloha Tower Development Corporation, except for the property occupied by Hawaiian Electric Company makai of Nimitz Highway, reducing the Makai Area to 221 acres. Figure 1 illustrates the current boundaries of the Kakaako Makai Area.

The 1990 revisions to the Kakaako Makai Area boundaries also brought revisions to the Makai Area Plan. Specifically, residential and industrial uses were eliminated from the

Makai Area. Other major revisions from the original development concepts of the 1985 plan included:

- The relocation of many existing uses to Sand Island, Kapalama, and Honolulu Harbor;
- Revision of the roadway system to include a Cooke/Ohe couplet of one-way streets;
- The expansion of Ala Moana Park into Kewalo Basin;
- The creation of an inland waterway system;
- The provision for cultural and educational facilities within the waterfront park, and;
- Passenger cruise ship terminals at Piers 1 and 2.

Between 1991 and 1993, the HCDA conducted several feasibility studies on many of the ideas proposed in the 1990 plan. These studies led to a reevaluation of the land use pattern and concepts in the Makai Area. The resulting changes were articulated in the 1994 Proposed Makai Area Plan and SEIS. Overall, there was a desire to create a stronger mauka-makai link, a more active pedestrian environment, and to improve vehicular and pedestrian flow in the area. A residential component was incorporated into the plan due to the strong demand for housing in Honolulu. The plan also added several blocks above Ala Moana Boulevard along Cooke Street to the Makai Area boundaries to continue to reinforce the central promenade theme through the mauka area. The transportation system was reevaluated to accommodate two major couplets (pair of one-way streets) for Ala Moana Boulevard/Ward Avenue, and Cooke/Koula Streets. In addition, the plan increased the maximum building height along Ala Moana Boulevard from 200 feet to 300 feet. Other changes included the deletion of the system of inland waterways and the proposed amphitheater was made smaller. Although the Final Supplemental EIS was accepted in October 1994, the proposed revisions to the Makai Area Plan were never adopted by the HCDA.

In 1998, the Makai Area Plan was revised because of a desire to balance public costs with revenues from private development, create a livelier urban environment, and improve vehicular and pedestrian flow through the area. One of the major revisions of the 1998 Plan was the elimination of the proposed residential component of the 1994 Plan. The residential component was eliminated because of perceived conflicts between residential use and noise-generating commercial and recreational uses. In addition, it was realized that the Makai Area's favorable location and amenities would make it an attractive location for new businesses. The Commercial zone was redesignated and was envisioned as an area that could accommodate a wide-range of commercial land uses such as offices and retail establishments. In addition, a Mixed-Use Zone-Industrial designation was added to support the maritime activities and facilities at Honolulu Harbor and the maximum building height in the Makai Area was reduced from 300 to 200 feet. The 1998 Makai Area Plan was adopted by the HCDA in August 1998.

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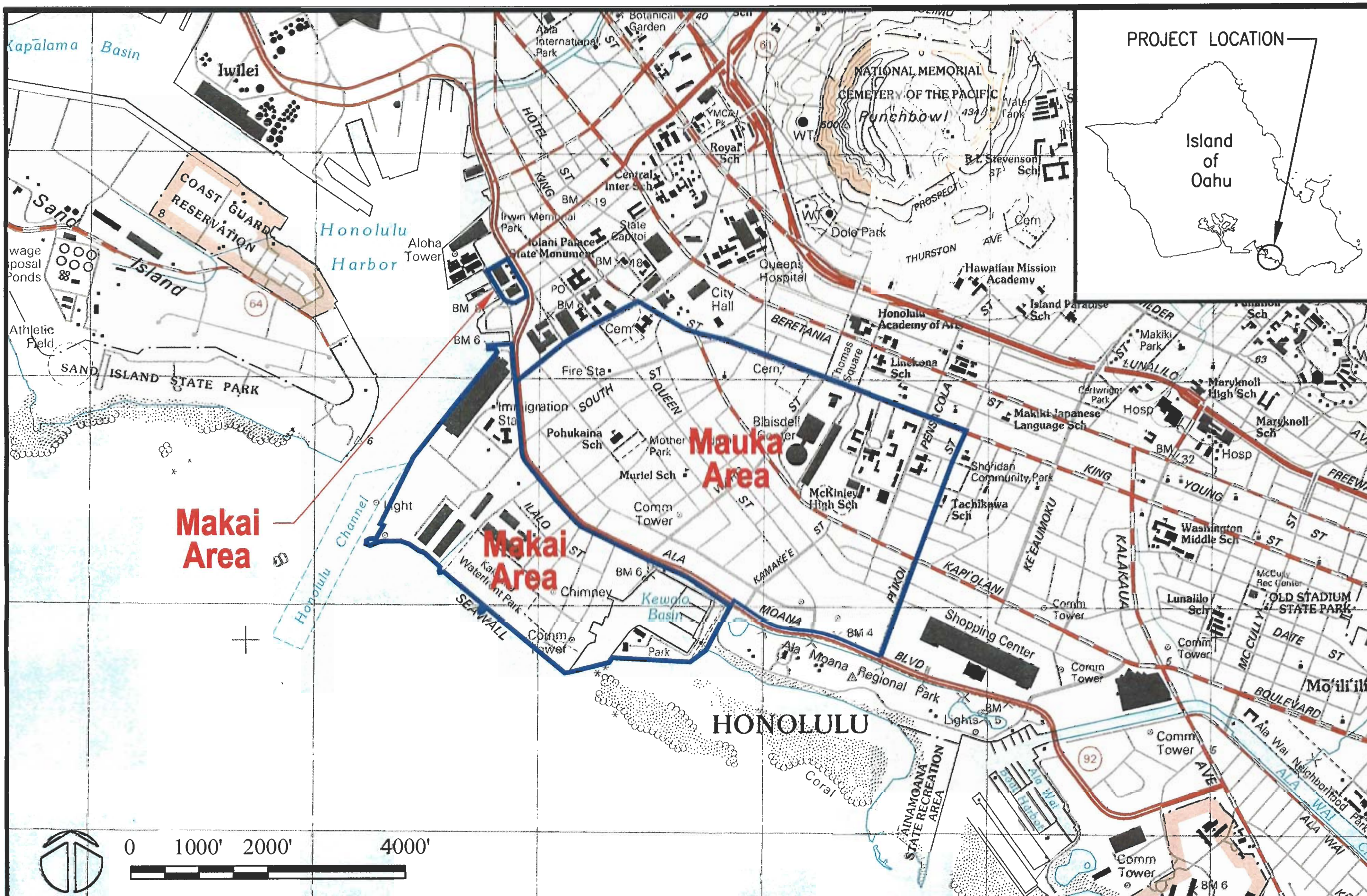

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LOCATION MAP

Figure 1

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In October 2002, the HCDA adopted a Waterfront Business Plan to establish a specific vision, mission and strategy for the future development of the Makai Area. The Waterfront Business Plan recognized that residential use in the Makai Area is essential in creating a work-live-shop-play community. The recommendations of the Waterfront Business Plan are the basis for the proposed amendments.

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2 DESCRIPTION OF THE PROPOSED ACTION

2.1 Proposed Amendments

The HCDA proposes to amend the Makai Area Plan and Rules to allow residential use in the Kakaako Makai Area. A Mixed-Use zoning district (MUZ) will be established where residential, commercial and public uses will be allowed. The existing Makai Area Plan Land Use Zones and Height and Density Plan are shown in Figures 2 and 3, respectively. The proposed Makai Area Plan Land Use Zones and height and density limits are shown on Figure 4. As shown on the Proposed Plan, about 62.15 acres presently designated as commercial (C) will be redesignated as MUZ. The Makai Area Rules will also be amended to allow residential use in the 22.3 acre Waterfront Commercial (WC) zone and the height limit for the WC zone will be increased from 45 feet to 65 along the Ewa edge of Kewalo Basin. The existing MUZ-I zone will be unchanged and will continue to support maritime activities and facilities within Honolulu Harbor and limited commercial activities.

2.2 Project Need

The proposed amendments to the Makai Area Plan retain the original development concept of creating an active, people-oriented gathering place. The commercial, industrial, and recreational uses proposed by the 1998 Makai Area Plan continue to be desired and are consistent with the vision for Kakaako, which is to establish the District as the most desirable urban place in Hawaii. This vision supports the legislative intent of creating a mixed-use district where residential, commercial, industrial and public uses would complement each other. In order to achieve these planning goals, residential use must be allowed and encouraged in the Makai Area.

The integration of residential and commercial uses is consistent with the concepts of "livability" and "sustainability" that have been embraced nationwide in recent years. These concepts promote the development of walkable, mixed-use communities to prevent urban sprawl, reduce dependence on automobiles, and reduce the cost of providing infrastructure and public services. It is envisioned that the Kakaako Makai Area will become an "urban village" where residents can live, work, shop and socialize in the same area. The residential component is essential since residents provide the economic as well as social basis for the urban village character.

The Kakaako Makai Area is ideally situated for residential use because of its close proximity to numerous employment opportunities available in Honolulu's central business district, to established retail centers, and to recreational amenities including Kakaako Waterfront Park and Ala Moana Park. These characteristics support the HCDA's goal of creating a walkable, mixed-use community in the Makai Area.

A Residential Use and Demand Assessment (Assessment) was prepared to evaluate the market for and appropriateness of residential use in the Makai Area. For comparison, the Assessment evaluated four North American mixed-use projects including Pike Place

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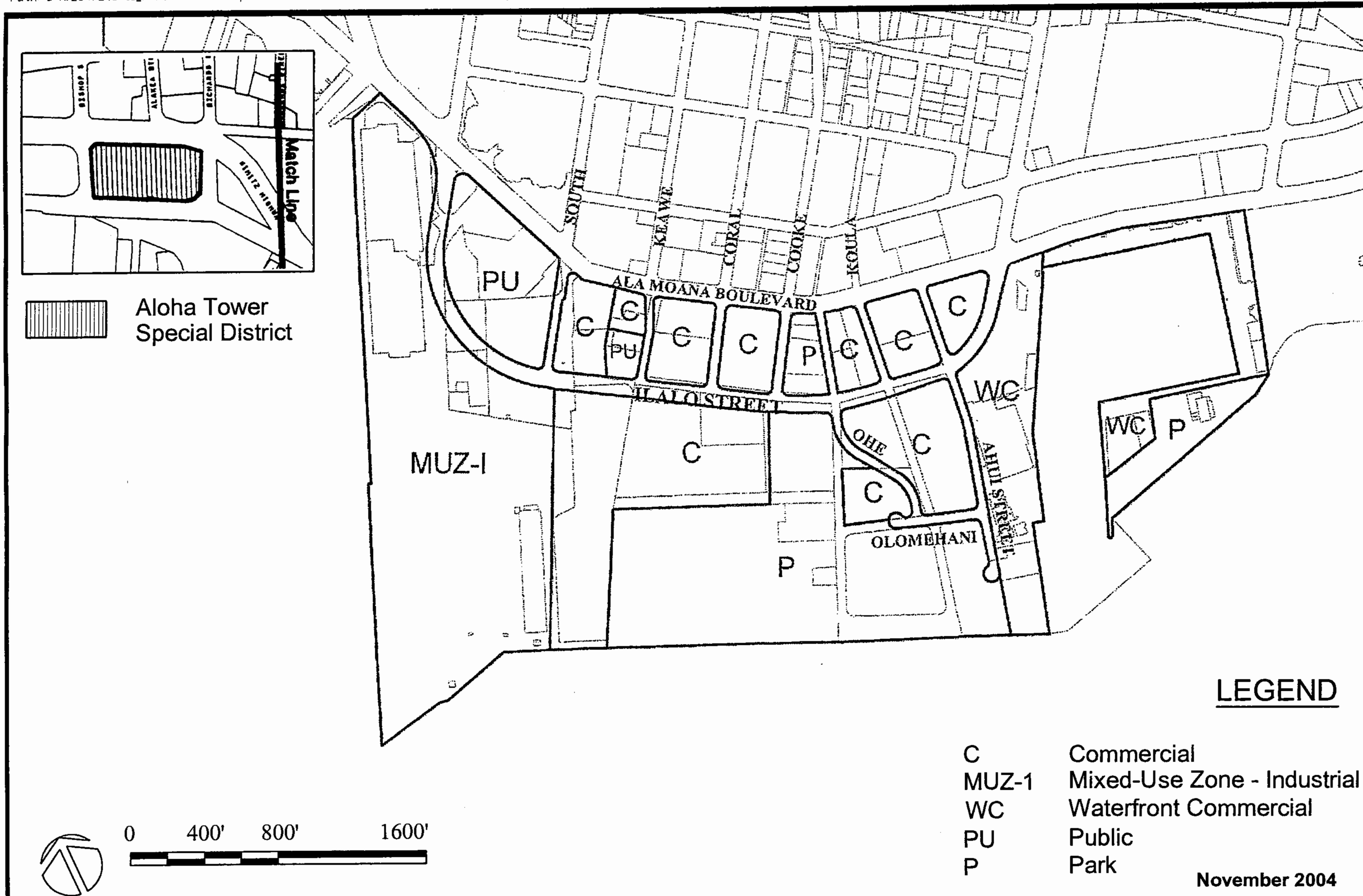

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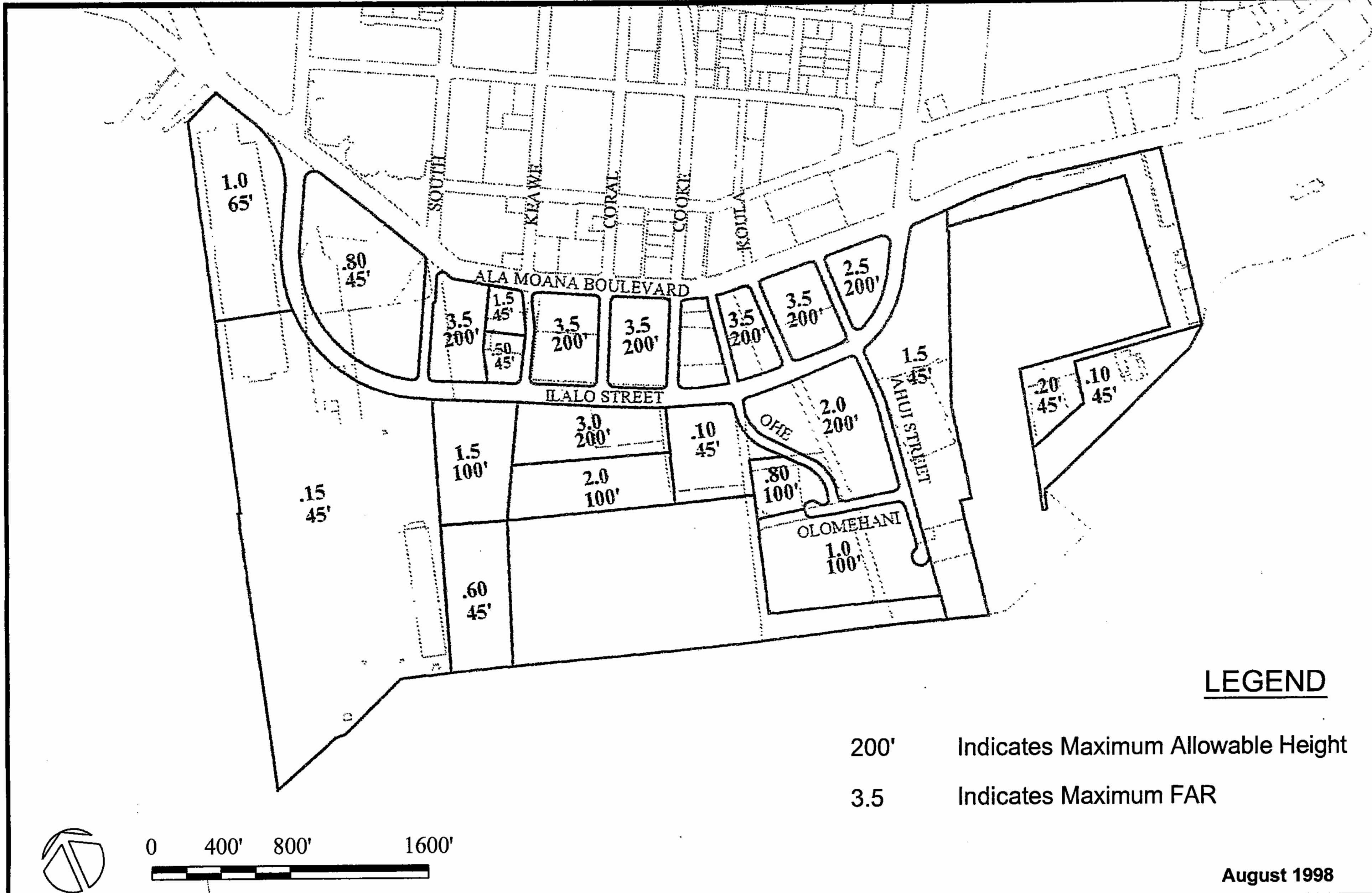
Existing Makai Area Land Use Zones

Figure 2



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Existing Maximum Height and Density Plan

Figure 3

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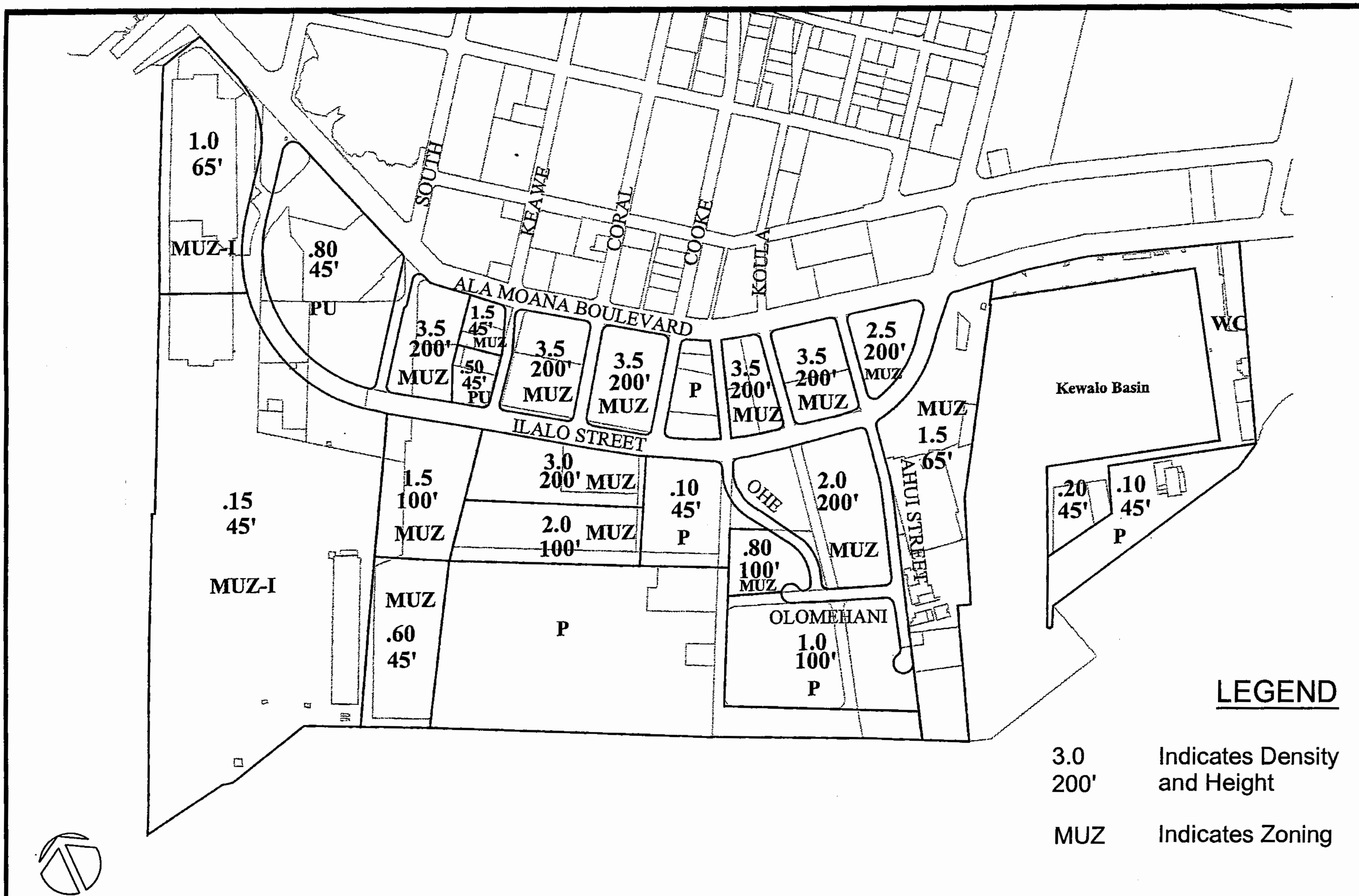

LEGEND

3.0 200'	Indicates Density and Height
MUZ	Indicates Zoning

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Proposed Makai Area Land Use Zones, Height & Density

Figure 4

Market (Seattle, Washington), Carillon Point (Kirkland, Washington), RiverPlace (Portland, Oregon), and Concord Pacific Place (Vancouver, British Colombia, Canada).

The Assessment found that residential use is increasingly seen as the "cornerstone", or dominant element of mixed-use developments. This is because residents of mixed-use developments enhance retail markets, particularly on evening and weekends. Residents also create a deeper and more authentic sense of place and contribute to street life, as those who actually live in an area lend their tastes to other aspects of the development.

With respect to potential buyer markets for Makai Area residential units, based on an evaluation of units currently being marketed in Kakaako Mauka, buyers are likely to include a broad range of household types, most often headed by persons ranging from 35 to 64. On Oahu, this group can be expected to increase by over 40,000 persons over the next 10 years, with possibly even more growth occurring in the 50 to 64 age group, and compensating for possible declines in the 35 to 49 age group. In the 2000 to 2004 period, sales of new condominium units in Kakaako Mauka to Hawaii residents represented about 40 units sold per 1,000-population increase in these combined age groups on Oahu. Given the demographic changes Oahu is experiencing, the increasing share of Honolulu residents interested in living in a denser urban center, and additional market support likely to be provided by out-of-state residents, Kakaako as a whole could be expected to be able to absorb 3,300 market-priced, for-sale units within the next ten years. With its superior view, frontage characteristics, and limited capacity for residential units, housing developed in the Makai Area would likely be absorbed quickly without even fulfilling all of the potential demand for such units. Residential units within the Makai Area are intended to serve the moderate price range, size, and quality level for the District's workers.

With respect to increasing the height limit for the WC zone, this amendment is proposed because the high water table in this area precludes below-grade development. This is a considerable constraint because parking garages, that could potentially be constructed underground, must now be built at or above grade. The long but narrow configuration of this area is also a severe development constraint. It is envisioned that a mixed-use development in this area could include apartments and/or condominiums constructed above retail uses.

2.3 Schedule

The HCDA is expected to consider adoption of the proposed amendments to the Makai Area Plan and Rules in the fall of 2005, following completion of the environmental review process. The Makai Area Plan is intended to provide guidance for the long-term development of the Kakaako Makai Area. Development of state-owned lands will be pursued by the HCDA as lands become unencumbered and infrastructure is upgraded.

2.4 Funding

Considerable public expenditure has already occurred in the Makai Area, principally for infrastructure improvements and park construction. Further expenditures, for infrastructure development, are planned to accommodate the development proposed by the Plan. Large-scale infrastructure improvement projects are funded through the HCDA's Improvement District program. The City and County of Honolulu also implements improvements to water and sewer systems in the Makai Area separate from the Improvement District program and telephone, electric, and cable television companies fund improvements to their systems to meet customer demand. The proposed amendments will not substantially affect public expenditures as the infrastructure improvements undertaken or being planned will be adequate to support residential development.

3 EXISTING ENVIRONMENT, ANTICIPATED IMPACTS AND MITIGATION MEASURES

3.1 Physical Environment

3.1.1 Climate

The climate of the Makai Area, similar to that of other coastal areas in Honolulu, is characterized by abundant sunshine, persistent trade winds, relatively constant temperatures, and moderate humidity. The mean temperature in Honolulu ranges from 73 degrees Fahrenheit (ºF) in the winter to 81ºF in the summer. The mean annual rainfall is approximately 23 inches with most of the rainfall occurring between the months of November and April. Relative humidity ranges between 56 and 72 percent. Cooling tradewinds from the northeast prevail throughout most of the year, while occasional "Kona" winds from the south bring warm, humid air.

Cooler microclimatic conditions have resulted from the replacement of large paved areas with the waterfront parks. These cooling conditions are anticipated to continue with the addition of landscaped park and buffer areas planned throughout the Makai Area.

3.1.2 Geology, Topography and Soils

The Kakaako Peninsula lies on the Honolulu coastal plain, an emerged fossil reef formed approximately 120,000 years ago (MacDonald and Abbott, 1970). The Makai Area is underlain by a coral layer between 5 and 20 feet below mean sea level (MSL). Soft lagoonal deposits made up of sand, silt, and clay are found above the ancient reef, mainly in a buried stream channel that extends below Ala Moana Boulevard between Keawe and Ohe Streets to the ocean. Soft alluvial soils within the channel area extend to depths of 50 to 65 feet below sea level. These deposits are covered by 5 to 10 feet of dredged coral fill. The filled-in former reef lands in the Kakaako Makai Area are also known as Kaakaukukui.

The substrata conditions of the project area are rated "average" for development purposes in all areas except in the general area of the buried stream channel where the substrata condition is "poor". Areas described as "average" would probably support structures of up to 22 feet without special foundations. These structures would have to be relatively light and use continuously light loaded individual spread foundations with spans of less than 20 feet. Areas rated “poor” will also require special foundations to support larger structures. (Kakaako Community Development District Plan Supplemental EIS, 1985).

The terrain of the Makai Area is generally at an elevation of 14 feet above MSL and flat (less than 5 percent slope), except for a large mound located makai of Olomehani and Keliikoi Streets. The debris mound was formed between 1927 and 1977 when the area was an incinerator landfill. Originally rising 15 to 55 feet above sea level, the 1,700 foot long by 400 foot wide mound was resculptured in conjunction with Phase I of the

Kakaako Waterfront Park, and has become one of its most prominent features. At its highest point, the resculptured mound is currently about 53 feet above MSL.

Impacts and Mitigation Measures
Kakaako's soils and geology will affect costs of constructing new building foundations. Foundations built in areas with substrata defined as "poor" will require more extensive support systems. A large portion of the area designated "poor" has been planned for park use where lighter weight structures such as pavilions, benches, and picnic tables will be constructed. The highest foundation costs will be incurred within areas of buried stream channels.

3.1.3 Hydrology and Drainage

The nearest surface stream in the vicinity of the Makai Area is Nuuanu Stream, located about 0.3 mile northeast of Aloha Tower. Southern Oahu's coastal plain, which includes the Kakaako Peninsula, is underlain by sedimentary deposits that form a caprock that retards the seaward movement of fresh groundwater from the basal aquifer. The caprock extends along the coastline about 800 to 900 feet below sea level. According to the Underground Injection Control (UIC) maps from the DOH, there are a number of wells located in the Makai Area, none of which are being used as a source for potable ground water.

Urbanization of the Makai Area and upland areas have increased runoff to the nearshore coastal waters. Although roadway and drainage improvements have been undertaken, much of Kakaako is still subject to localized flooding because of its flat topography and inadequate drainage facilities. The runoff from the Makai Area is collected by the street storm drain system and routed to the Keawe Street open channel or Kewalo Basin. The Keawe Street open channel, which is approximately 30 feet wide, 15 feet deep and 650 feet long, is located between the intersection of Keliikoi and Keawe Streets and discharges into the ocean. The drainage from the east portion of the Makai Area flows out to Kewalo Basin via drain outlets Diamond Head of Ahui Street.

Impacts and Mitigation Measures
During the short-term construction period, storm runoff may carry increased amounts of sediment into the storm drain system due to erosion from exposed soils. This runoff could potentially impact the water quality of nearshore waters in the area. Adherence to the requirements of the City and County of Honolulu grading ordinance should adequately mitigate this impact. Pursuant to Section 11-5-34.08(b) Administrative Rules of the DOH, a National Pollutant Discharge Elimination System (NPDES) Permit for construction stormwater discharges will be required for areas greater than one acre where soil disturbance (such as clearing, grading and stockpiling) is anticipated. A Drainage and Erosion Control Plan would be required, including the specification of best management practices, to minimize impacts from the discharge of runoff and pollutants from construction activities.

In recent years, substantial improvements to the Makai Area drainage system, particularly along Ilalo Street, have been undertaken by the HCDA. Additional drainage improvements to Ohe Street, Ahui Street and Olomehani Street are scheduled to be undertaken later this year.

3.1.4 Flood Earthquake and Tsunami Hazard

As indicated by the Federal Flood Insurance Rate Maps, the greater portion of the Makai Area encompassing Aloha Tower to the Ewa edge of Kewalo Basin is designated Zone X, "Other Areas" determined to be outside of the 500-year flood plain (See Figure 5). Small areas from Piers 1 and 2 to Keawe Street, and the general circumference of Kewalo Basin, are in Zone A, a special flood hazard area which may be inundated by the 100-year flood, with no base flood elevations determined. A small part of the Makai Area involving the mauka portion of Kewalo Basin is in Zone AE, a special flood hazard area inundated by the 100-year flood with a base flood elevation of 4 feet above MSL.

Most of the shoreline within the project area, having been altered by dredge and fill operations, is characterized by shore protection structures. Rock revetments along the shorefront of the Kakaako Waterfront and Kewalo Basin Parks protect against shoreline erosion damage and runoff into the ocean.

Generally, the risk of earthquake hazard to Oahu is minimal, however all structures within the project site will be designed to meet seismic requirements of the Honolulu Building Code. According to the Civil Defense Tsunami Inundation Map for Oahu, the shoreline areas from Kewalo Basin to the southwest corner of the Kakaako Peninsula are within the tsunami inundation zone. According to the Oahu Civil Defense Agency, steel and/or concrete buildings of six or more stories in height should provide adequate protection if people move to the third floor or above.

<u>Impacts and Mitigation Measures</u>

All developments in the Makai Area will be in accordance with the regulatory shoreline setback requirements and flood hazard requirements specified in Article 7 of the City and County of Honolulu, Land Use Ordinance. Planned uses and activities along the shoreline areas have considered the associated flood hazard potential and are predominantly in park and open space uses. Civil Defense sirens have been installed in the Makai Area to provide warning in the event of an emergency.

3.1.5 Flora and Fauna

Generally, the Makai Area is a highly altered urban environment providing little natural habitat for terrestrial flora and fauna. Plant species in the Makai Area are largely drought-resistant or salt-tolerant introduced species commonly found in a shoreline environment. Introduced weedy grasses and plants are common throughout the site, with occasional native species found on Kewalo Peninsula. Much of the vegetation in the Makai Area was

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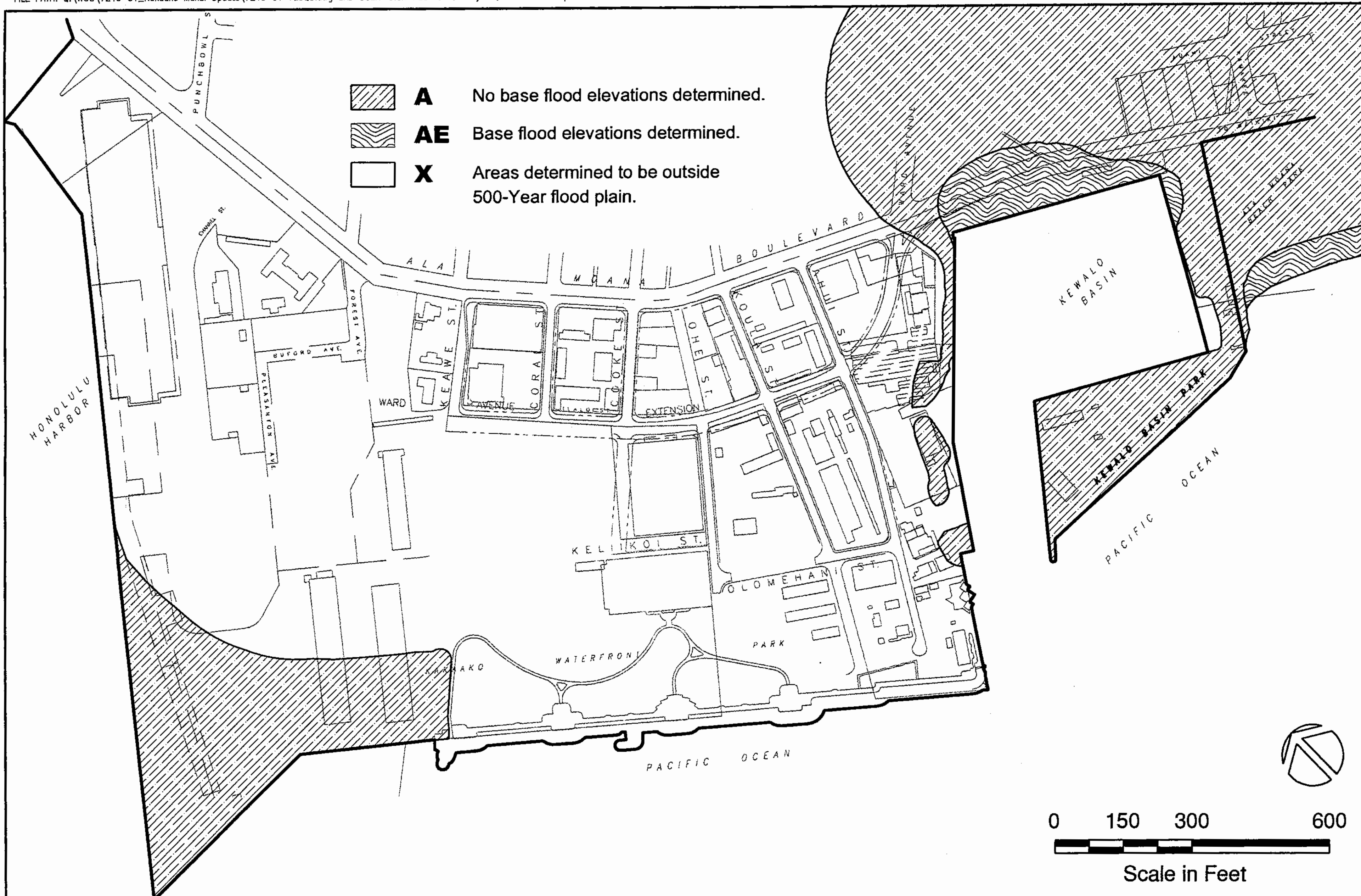

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Flood Hazard Map

Figure 5

planted as part of the landscaping for the Kakaako Waterfront Park and Kewalo Basin Park, and includes the following: Iceplant (Carporbrotus edulis); Molokai Osmanthus (Wikstroemia uva-ursi); Beach Ilima (Sida fallax); Asystasia (Asystasia gangetica); Ohai (Sesbania tomentosa); Dwarf Pittosporum (Pittosporum tobira); Beach Naupaka (Scaevola taccada); Spider Lily (Crinum asiaticum); Red Hibiscus (Hibiscus kokio); Carissa (Carissa grandiflora); Seagrape (Coccoloba uvifera); Monkeypod (Samanea saman); Autograph Tree (Clusia rosea); Hala (Pandanus tectorius); Hau (Hibiscus tiliaceus); False Kamani (Terminalia catappa); True Kamani (Calophyllum inophyllum); Chinese Banyan (Ficus retusa); Coconut (Cocos nucifera) and Beach Heliotrope (Heliotrope curassavicum). (Communication, Miyabara Associates, June 1994).

Species of cats and mice common to inner city environments are present in the Makai Area. Avifauna species that inhabit the project site include mynahs, finches, and doves. No threatened or endangered flora or fauna species are known to exist in the Makai Area.

Impacts and Mitigation Measures

No significant adverse impacts to flora or fauna resources are anticipated to result from implementation of the proposed Makai Area Plan, including the construction of residences. The Makai Area Plan provides for a variety of park environments generously planted with native and non-native plants. Residential developments would likely include landscaped areas that will introduce new plant species to the area, and subsequently attract birdlife common to urban areas.

3.1.6 Air Quality

An air quality impact study, prepared in conjunction with the Honolulu Waterfront Master Plan in 1989, describes the waterfront area as having a variety of stationary and mobile sources of air pollution. Hawaiian Electric Company's (HECO) downtown power plant is the primary stationary source, while vehicular traffic represents the principal mobile contributor. Emissions from the power plant are in compliance with State and Federal air pollution control regulations and are within ambient air quality standards. Vehicular traffic, however, has contributed to carbon monoxide levels that have occasionally exceeded State standards.

Impacts and Mitigation Measures

During the short term, construction-related air quality impacts include dust from excavation activities, the transportation of excavated material, and emission of hydrocarbons or exhaust fumes from construction equipment and employee vehicles. Under normal tradewind conditions, dust and fumes will be dispersed away from the project site toward the ocean. However, during the presence of Kona winds, pollutants would be blown landward which may contribute towards a decline in air quality. Impacts from fugitive dust will be mitigated by complying with the provisions of the State Department of Health, Hawaii Administrative Rules, Chapter 11-60.1 “Air Pollution Control.” Possible mitigative measures include erecting dust screens, watering down loose soils, and establishing temporary groundcover. In addition, all construction equipment must meet the requirements of State emission control laws in order to mitigate the effects of construction on air quality.

Long-term air quality impacts are anticipated to be largely similar to, or in some instances less intense than, those cited in the Air Quality Impact Report which was prepared in conjunction with the Honolulu Waterfront Master Plan. According to the Air Quality Impact Report, future impacts to air quality will generally be traffic related. Traffic emissions will likely contribute to elevated carbon monoxide levels along the Nimitz Highway/Ala Moana Boulevard corridor regardless of the redevelopment of the Makai Area. It is expected that the roadway improvements planned or previously constructed in the Makai Area will improve local traffic flow and reduce traffic related emissions. In addition, the landscaping and sidewalk improvements provided in the Makai Area contribute towards creating a pedestrian friendly environment that could reduce automobile usage, and thereby traffic emissions. Allowing residential use in the Makai Area could also reduce automobile use and traffic related emissions since residents will be able to walk to working, shopping, dining, and recreational destinations.

3.1.7 Noise Quality

The three main sources of noise in the Makai Area are traffic, industrial equipment, and aircraft. The U.S. Department of Housing and Urban Development (HUD) has established a land use compatibility matrix that sets 80 Ldn as the noise level that should not be exceeded in commercial/light industrial areas to protect public health and welfare. For recreational areas a level of 70 Ldn or less is acceptable. For the purposes of determining noise acceptability for funding assistance from Federal agencies such as HUD and the Federal Housing Administration (FHA), an exterior noise level of 65 Ldn or less is preferred in urban residential areas.

State statutes and administrative rules relating to noise quality include Hawaii Revised Statutes (HRS), Chapter 342F “Noise Pollution” and Hawaii Administrative Rules (HAR), Title 11, Chapter 46 “Community Noise Control”. According to HAR §11-46-4, the maximum permissible noise level for multi-family and commercial zoned areas is 60 dBA from 7 a.m. to 10 p.m. and 50 dBA from 10 p.m. to 7 a.m. The maximum permissible noise level for industrial zoned areas is 70 dBA. If an activity causes noise levels to exceed the maximum permissible level for more than 10 percent of the time for any 20 minute period, a permit or noise variance is required.

Impacts and Mitigation Measures

During construction, construction equipment and activity may increase short-term noise levels. Pile drivers and rock drills as well as earthmoving equipment such as bulldozers and diesel-powered trucks are anticipated to be the loudest equipment used during construction. As noise levels generated by construction activities are anticipated to exceed allowable limits, a permit must be obtained from the Department of Health (DOH).

The DOH may grant permits to operate vehicles, construction equipment, and power tools that emit noise levels in excess of allowable limits.

In addition, construction equipment and on-site vehicles or devices requiring an exhaust of gas or air must be equipped with mufflers. The use of vibratory hammers that produce less noise and vibration should be encouraged. Electric pumps for dewatering activities that operate at a quieter level than diesel or gasoline driven pumps should also be encouraged. Enforcement of DOH noise regulations, through citations of defective equipment and limitation of excessively noisy operations, will further mitigate noise impacts from construction activities.

In the long-term, the provision of residential use in the Makai Area is not anticipated to significantly impact noise quality, nor are ambient noise levels expected to significantly affect residents. Residential structures will likely be constructed of concrete and air conditioned, which will help to mitigate potential impacts. Furthermore, activities that consistently exceed permissible noise levels will be subject to DOH noise permit and variance conditions.

3.1.8 Water Quality

Nearshore coastal waters from Ala Moana Beach to the easterly entrance channel of Honolulu Harbor are designated "Class A" State waters by the DOH, while Honolulu Harbor and Kewalo Basin are designated "Class A" embayments. According to DOH, Class A waters are to be protected for recreational uses, aesthetic enjoyment and propagation of marine life.

Honolulu Harbor is a receiving basin for a number of pollution sources, which accounts for its generally poor quality. Nuuanu Stream contributes sediment deposits, industrial wastes and urban runoff. Other pollution sources are oil refinery activities, numerous storm drains, thermal pollution, effluent from a marine research center, and ship activity within the harbor.

Impacts and Mitigation Measures

During construction, stormwater runoff may increase until stabilizing groundcover can be established. For projects that disturb more than one acre, an NPDES Permit for construction stormwater discharges that specifies best management practices to minimize water quality impacts will be procured from the Department of Health (DOH).

Dewatering activities may be required to accommodate building foundations, as well as installation of underground utility systems. Effluent from dewatering activities will be treated prior to discharge into any drainage system or surface waters. Construction dewatering permits will be required by the City and County of Honolulu and the State DOH pursuant to City Ordinance and Section 11-5-34.08(b) HAR, respectively. Best Management Practices plans, which specify mitigative methods such as containment berms and detention ponds, will be prepared to control discharge of effluent resulting from dewatering activities.

3.2 Socio-Economic Environment

At present, the general mix of land uses in the Makai Area consists of maritime industrial cargo and warehousing operations at Fort Armstrong, light industrial, public facility, and commercial office activities in the central portion of the peninsula, and the Kakaako Waterfront Park.

The Kewalo Basin area provides a berthing location for cruise/excursion boats and charter fishing boats. Landside activity surrounding the harbor include maritime support operations, marine research and commercial restaurant operations.

The Kakaako Peninsula area, which lies between Kewalo Basin and Downtown Honolulu, includes maritime industrial uses at Fort Armstrong, the Foreign Trade Zone warehouse and offices, commercial and office uses and automobile dealerships. The new University of Hawaii John A. Burns School of Medicine is also scheduled to open in mid-2005.

3.2.1 Land Uses and Encumbrances

The Makai Area encompasses a total of approximately 221 acres of which approximately 201 acres are owned by the HCDA, 4.6 acres are owned by the Federal government in the Fort Armstrong area, 3.4 acres are owned by HECO, and the estimated balance of 12 acres are owned by private interests. Various rights-of-way owned by the City and County of Honolulu are included in the lands owned by HCDA. Figure 6 illustrates major existing uses in the Makai Area.

Various land uses in the Makai Area are allowed through executive order, general lease, or revocable permit. Executive orders are issued by the Governor and allow government agencies to utilize State-owned land for a specified public purpose. General leases are issued by the Department of Land and Natural Resources (DLNR), Department of Transportation (DOT), and HCDA and allow tenants to occupy State-owned land for a specified purpose and term, not to exceed 65 years. Revocable permits, also issued by DLNR, DOT, and HCDA, allow tenants to occupy State-owned land for a specified purpose on a month-to-month basis. The following is a description of existing uses by sub-area.

3.2.1.1 Kewalo Basin

The Kewalo Basin sub-area is bounded by Ala Moana Park to the east and Ahui Street to the west. A significant physical feature of the basin is the landfilled Kewalo Peninsula that shelters the harbor from open ocean disturbances and marks the makai boundary of the area. The sub-area also fronts Ala Moana Boulevard, makai of Ward Warehouse.

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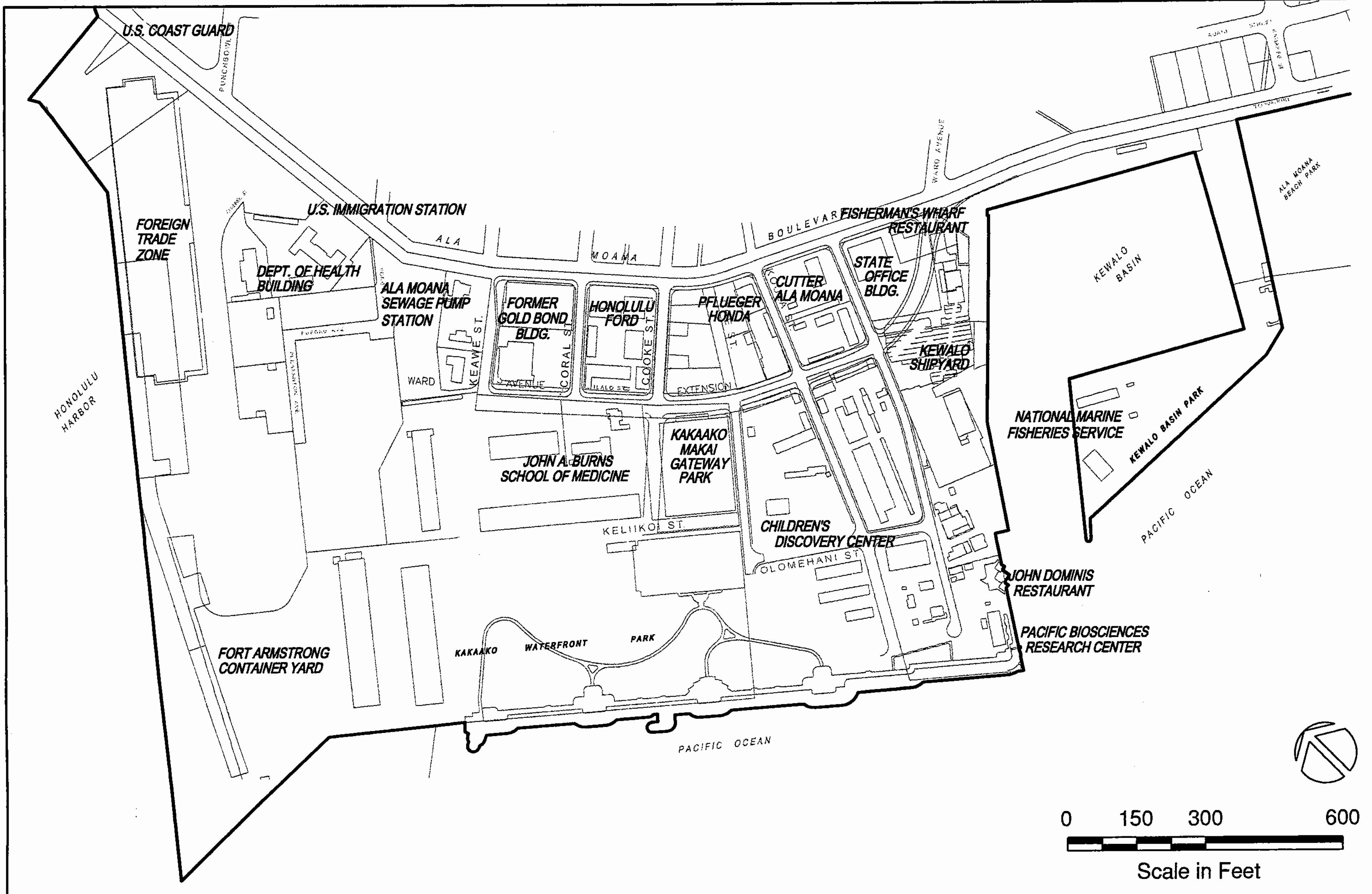

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Existing Land Uses

Figure 6

Land and Water Uses - Kewalo Basin contains approximately 25 acres of fast land and 29 acres of submerged lands, providing berthing space for Oahu's commercial fishing fleet, cruise/excursion boats and charter fishing fleet. Water access into the harbor is via a 350-foot wide entrance channel between the Kewalo and Kakaako peninsulas. The area surrounding the harbor is occupied by activities that support maritime operations, marine research and commercial restaurant operations.

Landownership and Leases - The entire Kewalo Basin is owned by the HCDA. Long-term leases exist for most of the property along the Ewa edge of the Kewalo Basin sub-area. Existing uses include the Pacific Biosciences Research Center, John Dominis Restaurant, Honolulu Marine Inc. drydock and shipyard facility, Fisherman's Wharf Restaurant, Kewalo Basin Park, and the National Marine Fisheries Service Laboratory.

3.2.1.2 Kakaako Peninsula

The Kakaako Peninsula sub-area lies between the Kewalo and HECO sub-areas, on a largely man-made peninsula. Ahui Street marks the Diamond Head boundary, while pier frontage at Fort Armstrong (Piers 1 and 2) marks the Ewa boundary.

Land and Water Uses - Specific land uses in this area include maritime industrial, commercial, recreational, marine research, and public facilities.

Maritime industrial uses occupy the Fort Armstrong area at Piers 1 and 2. This area, once the primary container cargo facility on Oahu, is currently dedicated to maritime break-bulk and limited container cargo operations, passenger cruise ship operations, ship maintenance operations, and the Foreign Trade Zone warehouse and offices.

Commercial uses occupy much of the central portion of the sub-area. Four blocks which run along the makai side of Ala Moana Boulevard between Koula, Keawe, and Ilalo Streets, are owned by the Kamehameha Schools and are presently dominated by new and used car sales businesses, and the 677 Ala Moana Building.

The 30-acre Kakaako Waterfront Park provides recreational uses such as shoreline fishing, picnicking, biking, jogging, and scenic viewing. The Children’s Discovery Center is located adjacent to the Kakaako Waterfront Park and provides interactive exhibits for children and families.

The University of Hawaii’s new John A. Burns School of Medicine (JABSOM) is located on a 9.9-acre site between the Kakaako Waterfront Park and Ilalo Street. The JABSOM Education and Administration building has opened and the research building is scheduled to open in September 2005.

Most of the City and County of Honolulu’s Corporation Base Yards that were located in the Kakaako Peninsula have relocated, however, the Department of Environmental

Services Wastewater Collection and Maintenance Branch's Base Yard is still operating on a site makai of Olomehani Street. The City's Ala Moana Wastewater Pump Station (WWPS) is located on Keawe Street.

Three historic structures located in the Kakaako Peninsula include the U.S. Immigration Station, the Department of Health Building, and the former Ala Moana WWPS situated along Ala Moana Boulevard in the Fort Armstrong area.

3.2.1.3 HECO Parcel

The HECO parcel encompasses about 3.4 acres of privately owned land. The parcel is bounded by Nimitz Highway, Bishop and Richards Streets and a former portion of Ala Moana Boulevard, and is occupied by the Honolulu Power Plant. With a capacity of 120 megawatts of electricity, the plant currently services the Downtown area.

Impacts and Mitigation Measures

Implementation of the Makai Area Plan will upgrade a predominantly older, underutilized commercial-industrial area into a modern, higher density environment. Many of the existing uses in the Makai Area will eventually be displaced. Because displacement will be necessary for redevelopment in the Makai Area, the timing and phasing of the transition will be critical in terms of mitigation. Landowners and lessees will be kept informed of pending developments through special notices as deemed necessary.

The long-term impacts on the existing land uses and activities in the Makai Area will be positive, as the net result of the plan's implementation will be increased residential, recreational and commercial development opportunities. The proposed roadway system will facilitate traffic flow through the Makai Area, while urban design and open space enhancements will improve the overall appearance of the area.

Residential projects on HCDA owned lands would likely offer some units for sale on a fee-simple basis, thereby slightly reducing the amount of publicly owned land in the Kakaako Makai area. However, the majority of land in the Kakaako Makai Area including the Kakaako Waterfront Park, Makai Gateway Park, Kewalo Basin Park, Children's Discovery Center, John A. Burns School of Medicine, and Fort Armstrong Area, would continue to be publicly owned.

3.2.2 Population and Housing

The Kakaako Community Development District is generally comprised of the Kakaako and Ala Moana census tracts. According to the U.S. Census Bureau, in 2000 there were 6,616 persons living in the Kakaako and Ala Moana census tracts and the overall average household size for both tracts was 1.83 persons. The average household size is considerably smaller than the Oahu average of 2.95 persons, a reflection of the high percentage of apartment and condominium units in the Kakaako area. The median age of persons in the Kakaako and Ala Moana census tracts was 44.2 years and 39.9 years, respectively, which is older than the Oahu average of 35.7 years.

There is presently no resident population in the Makai Area since residential use is not permitted.

Impacts and Mitigation Measures

At full development, about 1,100 housing units could be built in the Makai Area. The majority of the units would probably be for-sale condominium units. Based on condominium sales trends in the Kakaako Mauka Area, it could be expected that 60% to 70% of buyers will be Hawaii residents with the remainder of buyers principally coming from the U.S. west coast. Buyers from other U.S. locations and Asia could also be notable sub-markets. Among the Hawaii buyers, most can be expected to be reaping the equity from another home in order to purchase in the Makai Area, although at lower price levels there may also be first-time homebuyers. The majority of buyers would probably purchase the units as a primary residence. It is anticipated that the market targeted for residential units in the Makai Area will be for employees working in the Kakaako district. Purchase conditions may be imposed to favor the District's employees. Based on an average household size of 1.83 persons, about 2,000 persons may reside in the Makai Area at full development. Given the Makai Area's favorable location and amenities, prices for units are expected to start at about $350,000.

Affordable housing requirements similar to those set forth in the Kakaako Mauka Area Rules will also be applied to housing developments in the Makai Area. These rules, set forth in Hawaii Administrative Rules §15-22-115, require that multi-family developments on lots 20,000 square feet and greater must provide at least twenty percent of the total number of dwelling units in the development for sale or rental to qualified persons, as determined by the HCDA. The existing rules for the Mauka Area also give Developers the option of meeting their affordable housing requirement off-site or to pay a fee in-lieu of constructing affordable housing.

3.2.3 Economic

The State of Hawaii has rebounded in recent years from the economic slump that affected it for much of the 1990's. Gross State Product, which had fallen or experienced little growth during much of the 1990's, appears to be on an upward trend. The increase in Gross State Product is reflected by increases in the statewide wage and salary job count which has risen every year since 1999. Within the City and County of Honolulu, the wage and salary job count rose from 403,700 in 1999 to 421,750 in 2003, a 4.3% increase. Federal, State and Local Government was the largest employer statewide in 2003 accounting for 21% of all jobs, the Trade, Transportation and Utilities industry accounted for 19% of jobs, and the Leisure and Hospitality industry accounted for 17% of all jobs.

The primary activities in the Makai Area include commercial uses along Ala Moana Boulevard and light industrial activities in the interior of the peninsula. The new University of Hawaii John A. Burns School of Medicine also opened earlier this year.

Impacts and Mitigation Measures

In the short-term, implementation of the Makai Area Plan will have favorable economic impacts by creating construction jobs for the as public and private developments proceed in the Makai Area. The number of construction jobs created would be dependent on the phasing, duration and design of new developments.

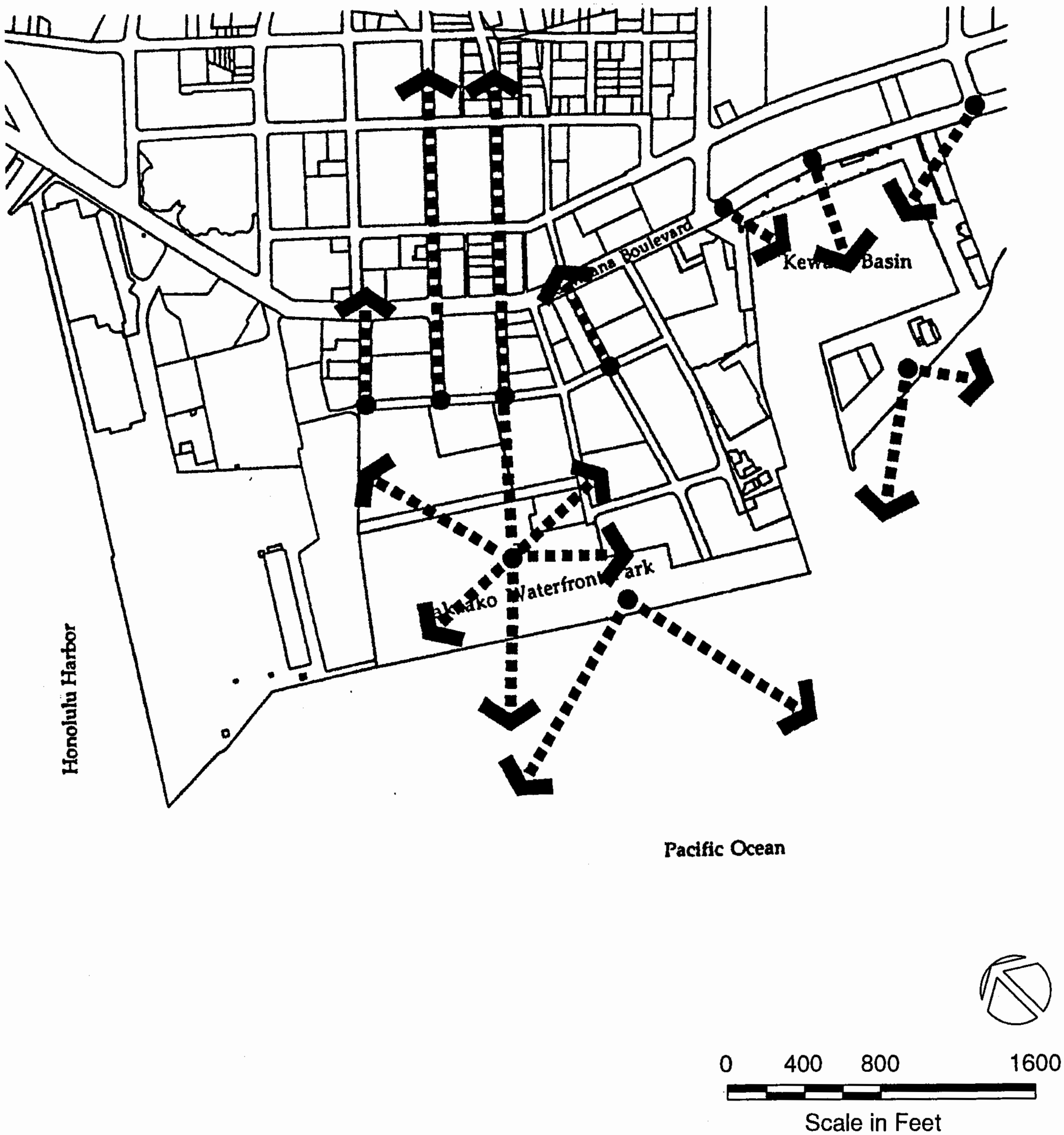
Long-term employment would be provided by the commercial, medical education and research, retail, restaurant, office and maritime industrial activities envisioned in the Makai Area. The number of jobs directly created would be dependent on the type and mix of commercial and retail establishments developed, which is dependent on market demand. Based on a potential build-out of 2,400,000 square feet of leasable commercial space and a factor of one employee per 250 square feet, commercial space in the Makai Area could ultimately support direct employment of 9,600 employees.

Overall growth of economic activity in the Makai Area is envisioned to provide increased revenue to State-financed redevelopment activities in Kakaako. The State will derive lease rent revenues from developments as well as increased general excise and income tax revenues. The City will benefit from the higher property tax base created by redevelopment of the Makai Area. The HCDA's Waterfront Business Plan estimates that $750,000 in new annual property taxes will be generated upon development of the Makai Area.

3.2.4 Open Space, Recreational and Visual Resources

The Makai Area consists of low-rise structures with the exception of the ten-story 677 Ala Moana Building and two four-story buildings recently constructed at the John A. Burns School of Medicine. Although there are pockets of open spaces in the Makai Area, the major open spaces are in the Fort Armstrong Area, the Kakaako Waterfront Park, and the Kakaako Makai Gateway Park. Overall maximum building heights gradually descend from taller structures mauka of Ala Moana Boulevard to lower structures along the Makai Area water frontages. Limits on heights range from 400 and 200 feet on the lands just mauka and makai, respectively, of Ala Moana Boulevard, to as low as 45 feet along park edges, and shorelines.

The oceanfront location of the Makai Area is one of its most favorable attributes. A variety of cruise ships, catamarans, fishing vessels, and barges can be seen entering and leaving Honolulu Harbor and Kewalo Basin, lending an active waterfront atmosphere to the area. This area is also one of the few places in Honolulu where a 360-degree panoramic view of the ocean, the Koolau and Waianae Ranges, Barbers Point, Downtown Honolulu, and Waikiki can be enjoyed. The Kakaako Waterfront Park has also increased and enhanced the view amenities in the area. In itself, the park is a valuable oceanfront view amenity which provides various viewing platforms. Existing views in the Makai Area are shown in Figure 7.



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Existing Views Diagram

FIGURE 7

The Kewalo Basin Park and the adjacent Kakaako Waterfront Park and Makai Gateway Park are both popular recreational areas. The Kakaako Waterfront Park features a shoreline promenade, picnic sites, an outdoor amphitheater, a scenic lookout, and expansive grassed areas. The park offers a variety of activities including shoreline fishing, picnicking, biking, jogging, and scenic viewing. Point Panic, located on the Kewalo Basin end of Kakaako Waterfront Park, is a popular site for body surfers and viewing vessel traffic in and out of Kewalo Basin. The Kakaako Makai Gateway Park offers passive recreational opportunities as well as fields for active recreation and festival use. The Kewalo Basin Park also offers areas for fishing, picnicking and scenic viewing.

A Coastal View Study was prepared by the City and County of Honolulu to identify significant views from within the Special Management Area (SMA) boundary on Oahu. Five types of views are categorized in the study, of which Type 5, "Highly Urbanized Areas" typifies the Makai Area. The following are significant views which can be enjoyed in the Downtown and Ala Moana subsections, in which the Makai Area lies.

- Continuous and intermittent views of Honolulu Harbor from Nimitz Highway;
- Stationary views from Sand Island Park looking east, west and mauka; and
- Continuous makai views across Kewalo Basin and Ala Moana Park.

Impacts and Mitigation Measures

No changes to allowable height and densities are being proposed except for the height increase at the Waterfront Commercial zone near Kewalo Basin. As such there will be no impact on open space resources in the Makai Area. The current Makai Area Plan contains development guidance policies and building height limits intended to preserve major view planes, view corridors, and shoreline and ocean views. Developments in the Makai Area are required to provide at-grade open space in the amount of 20% of the property area. The provision of residential use is anticipated to have no impact on open space resources in the Kakaako Makai Area. Increasing the height limit at the Waterfront Commercial zoned portion of the Makai Area from 45 feet to 65 feet may marginally affect viewplanes. However, the impact is not anticipated to be significant, since existing views are already affected by structures. Redevelopment of the area, whether with 45-foot high or 65-foot high buildings, would have a similar impact on view planes and view corridors. A simulation that depicts existing conditions in the Waterfront Commercial zone, development with a 45-foot height envelope, and development with a 65-foot height envelope, has been prepared. The visual simulation is shown in Figure 8.

The provision of residential use would likely increase use of recreational resources in the Makai Area. The City and County of Honolulu's park area requirements specify 110 square feet of park space per multi-family dwelling. Assuming 1,100 multi-family residential units are developed in the Makai Area, this translates to the need for 121,000 square feet of park space, or 2.8 acres. This requirement is more than satisfied by the Kakaako Waterfront Park, Makai Gateway Park, and the Kewalo Basin Park which total approximately 40 acres.

3.2.5 Historic and Archaeological Resources

Significant historic resources in the Makai Area include the Department of Health Building, the U.S. Immigration Station, and the former Ala Moana Wastewater Pump Station. These structures were constructed prior to 1941, and have been associated with a historic period or architectural style. The latter two are currently listed on the National Register of Historic Places, although all of these buildings are considered to have "high" preservation potential, historic significance, and can be feasibly maintained and sustained in their present condition.

Impacts and Mitigation Measures

The historic resources in the Makai Area are proposed to be preserved; hence no significant adverse impacts are anticipated as a result of the revised plan. The U.S. Immigration Station and Department of Health Building are government-owned and are currently functioning for public use. As such, continued preservation of these sites can be reasonably expected. The function of the historic Ala Moana WWPS was replaced by the City and County of Honolulu's new Ala Moana WWPS located adjacent to the historic structure. Any future uses will be compatible and consistent with preserving its cultural significance and role in the historic development of the Honolulu Waterfront.

During preparation of the 1998 Makai Area Plan Supplemental EIS the State Historic Preservation Division (SHPD) commented that "because the area makai of Ala Moana Boulevard is comprised of fill lands we believe that the development of the area will have "no effect" on subsurface cultural deposits because it is unlikely that any are present." The SHPD's letter is attached as Appendix C. In the event that any archaeological features or remains are uncovered in the Makai Area during construction, work will cease immediately and the SHPD will be notified to determine the proper course of action.

3.2.6 Cultural Resources

A cultural impact assessment report that included the Makai Area was prepared in 2002 for the John A. Burns School of Medicine (see Appendix B). The report found that much of the Makai Area were the nearshore waters of the ʻili of Kaʻākaukukui, of which the majority of lands, or 125 acres, were awarded to Victoria Kamāmalu through Land Commission Award 7713. Smaller kuleana lands were also awarded to seven other native tenants. A review of Native and Foreign Register and Testimony records revealed that claimants registered for house lots, fishponds, salt beds and cultivation areas including mauka kalo patches. By 1919, a seawall had been constructed near the present alignment of Olomehani Street and the area makai of Ala Moana Boulevard was filled. In the early 1900's, these lands supported an unauthorized fishing village until the Territorial government evicted the squatters in 1926. Cultural activities that continue to be practiced in the Makai Area include fishing, shoreline gathering, and recreational activities including swimming and surfing.

Existing Kewalo Basin Waterfront Edge Along Parcel 22

45 Ft. Height Envelope Scenario

65 Ft. Height Envelope Scenario

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Visual Simulation

Figure 8

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Impacts and Mitigation Measures

The proposed amendments are anticipated to have no adverse impact on cultural resources or practices since access to shoreline areas where cultural activities are practiced will be maintained.

3.3 INFRASTRUCTURE SYSTEMS AND SERVICES

This section addresses the existing conditions, impacts and mitigative measures relating to infrastructure systems and services which include roadways, water, wastewater, drainage, solid waste, power and communications, police and fire, medical and schools as they apply to the Makai Area.

3.3.1 Transportation System

3.3.1.1 Existing Roadway System

Several streets comprise the roadway system that serves the Makai Area and vicinity including Ala Moana Boulevard, Ward Avenue, and Punchbowl, Cooke and South Streets. Also providing access in and around the Makai Area are Ilalo, Pohukaina, Koula, Coral, Keawe, Ahui, Olomehani, and Ohe Streets.

The State-owned Ala Moana Boulevard serves as a major east-west arterial providing access through the Makai Area, with three through-lanes in each direction, in addition to separate left-turn lanes at most intersections. Traffic signal controls are located at each cross street except for Ahui and Ohe Streets, which are restricted to right-turns in or out of these streets. In recent years, traffic volumes along Ala Moana Boulevard within the vicinity of the Makai Area have not increased significantly since most of the surrounding areas have already been built out.

Punchbowl and South Streets provide north-south access to the Makai Area, and function as a one-way street couplet. Punchbowl Street provides three south-direction lanes below Halekauwila Street, ending with two left-turn lanes and two right-turn lanes on Ala Moana Boulevard. Parking is permitted along both curbs. South Street is a two-way street south of Pohukaina Street. The segment makai of Ala Moana Boulevard provides access to the Fort Armstrong area port operations. Parking is permitted north of Ala Moana Boulevard.

Ward Avenue also provides primary north-south access to the Makai Area, with two travel lanes in each direction, and left-turn lanes in intersections makai of Kapiolani Boulevard. On-street parking is permitted between Ala Moana Boulevard and Queen Street. As another secondary street facilitating mauka-makai travel through the Makai Area, Cooke Street has been widened to four lanes between Ala Moana Boulevard and Kapiolani Boulevard. Four-way STOP signs are used at the intersections of Pohukaina and Halekauwila Streets, while signalized controls are used at Queen Street. Parking is permitted in the curb lanes of most blocks.

Within the Makai Area, Ilalo Street serves as the primary east-west collector. Ilalo Street is a two-lane, two-way roadway with a landscaped median. Parking is permitted along most blocks.

3.3.1.2 Existing Traffic Conditions

A traffic analysis for the proposed Makai Area Plan amendment was prepared by Wilson Okamoto Corporation in May 2005 (Appendix A). Traffic counts were conducted at seven intersections along Ala Moana Boulevard in the Makai area during morning and evening peak hours of traffic. The Level of Service (LOS) for each of the intersections was determined. LOS is a qualitative measure used to describe the condition of traffic flow, ranging from excellent or free flow conditions at LOS A to overloaded conditions at LOS F. The study found that during the morning and afternoon peak hours, the majority of intersections operate at LOS D or E. Existing traffic operating conditions at the studied intersections are summarized in Table 1.

Impacts and Mitigation Measures

In order to forecast future traffic volumes, a development schedule for implementation of the Makai Area Plan was prepared with the assistance of the HCDA. The schedule provides approximate commercial and office floor areas and residential units that may be developed by 2009, 2014, and 2025. Based on the development schedule, traffic conditions and mitigation measures were projected for 2009, 2014, and 2025. Projected traffic operating conditions for Ala Moana Boulevard and Ilalo Street are summarized in Tables 1 and 2, respectively.

Year 2009 Projected Traffic Conditions

For the 2009 analysis, it was assumed that certain traffic improvements will already have been implemented including: 1) extension of Punchbowl Street from Ala Moana Boulevard to Ilalo Street with three north-bound left-turn lanes provided; 2) provision of all-way stop intersection control at the intersections of Ilalo Street with Forrest Avenue, Keawe Street, Cooke Street, and Ahui Street; and, 3) provision of two-way stop intersection control at the intersections of Ilalo Street with Coral Street, Ohe Street, and Koula Street.

During the AM peak period, the traffic movements along Ala Moana Boulevard at the intersections of Punchbowl Street, South Street/Forrest Avenue, Coral Street, Cooke Street, and Koula Street are anticipated to remain operating at LOS “D” or better while the north- and south- bound traffic movements at the intersection with Ohe Street are anticipated to remain operating at LOS “C”. Similarly, the traffic movements at the intersections with Keawe Street and Ward Avenue are expected to continue to operate at LOS “E” or better during the AM peak period. Traffic conditions along Ala Moana Boulevard during the PM peak period are expected to worsen with the levels of service for many of the traffic movements at South Street/Forrest Avenue, Coral Street, Cooke Street, and Koula Street deteriorating from LOS “D” to LOS “E”. The traffic movements at the

TABLE 1

Ala Moana Boulevard Existing and Projected Traffic Operating Conditions

Intersecting Street	Traffic Movement		Existing		Year 2009				Year 2014				Year 2025	
			AM	PM	AM		PM		AM		PM		AM	PM
					w/out Imp.	w/ Imp.	w/out Imp.	w/ Imp.	w/out Imp.	w/ Imp.	w/out Imp.	w/ Imp.	w/ Imp.	w/ Imp.
Punchbowl St.	Eastbound	TH	D	D	F	D	F	D	D	C	D	C	D	E
		RT	-	-	-	A	-	B	A	B	B	B	A	B
	Westbound	TH-RT	B	C	A	B	F	D	B	C	D	D	B	E
	Northbound	LT	-	-	F	D	F	D	D	C	D	D	D	E
	Southbound	LT	C	C	E	D	D	C	D	C	C	C	D	C
		RT	D	D	F	D	F	D	D	C	D	C	D	C
South St. / Forrest Avenue	Eastbound	LT	D	E	D	D	E	E	E	-	E	-	-	-
		TH-RT	B	D	B	B	D	D	B	D	E	E	D	E
	Westbound	TH-RT	D	E	D	D	E	E	D	C	E	B	B	B
	Northbound	LT-TH-RT	D	D	D	D	E	E	E	D	E	E	D	D
	Southbound	LT-TH	D	D	D	D	D	D	D	D	D	D	D	D
		RT	D	E	D	D	E	E	D	C	E	D	D	E
Keawe St.	Eastbound	LT	E	E	E	E	E	E	E	-	F	-	-	-
		TR-RT	E	E	E	E	E	E	E	-	F	-	-	-
	Westbound	LT	D	E	E	E	E	E	E	-	E	-	-	-
		TH-RT	D	C	C	C	C	C	C	-	D	-	-	-
	Northbound	LT-TH	E	E	E	E	E	E	E	-	F	-	-	-
		RT	E	E	E	E	E	E	E	C	F	C	C	C
	Southbound	LT-TH	E	E	E	E	E	E	E	-	F	-	-	-
		RT	E	E	E	E	E	E	E	B	F	C	C	C
Coral St.	Eastbound	LT	D	D	D	D	E	E	D	-	E	-	-	-
		TH-RT	D	D	D	D	E	E	D	-	F	-	-	-
	Westbound	LT	D	D	D	D	E	E	D	-	F	-	-	-
		TH-RT	D	C	C	C	C	C	D	-	C	-	-	-
	Northbound	LT-TH	D	D	D	D	E	E	D	-	F	-	-	-
		RT	D	D	D	D	E	E	D	C	F	C	C	C
	Southbound	LT-TH	D	D	D	D	E	E	D	-	F	-	-	-
		RT	D	D	D	D	E	E	D	B	F	C	B	C
Cooke St.	Eastbound	LT	D	D	D	D	E	E	D	E	E	E	E	E
		TH-RT	D	D	D	D	E	E	D	E	D	C	D	D
	Westbound	LT	D	D	D	D	E	E	D	E	E	E	E	E
		TH-RT	D	D	D	D	D	D	D	E	E	E	E	E
	Northbound	LT	D	D	D	D	D	D	D	E	E	E	E	E
		TH	D	D	D	D	D	D	D	D	E	D	D	D
		RT	D	D	D	D	D	D	D	D	D	D	D	D
	Southbound	LT-TH	D	D	D	D	E	E	D	E	E	E	E	E
		RT	D	D	D	D	E	E	D	E	E	E	E	E
Ohe St.	Northbound	RT	C	C	C	C	C	C	C	C	C	C	C	C
	Southbound	RT	C	C	C	C	C	C	C	C	C	C	C	C
Koula St.	Eastbound	LT	D	D	D	D	E	E	D	-	E	-	-	-
		TH-RT	D	D	D	D	E	E	C	-	E	-	-	-
	Westbound	LT	D	D	D	D	D	D	D	-	E	-	-	-
		TH-RT	D	D	D	D	C	C	D	-	C	-	-	-
	Northbound	LT-TH	D	D	D	D	D	D	D	-	E	-	-	-
		RT	D	D	D	D	D	D	D	B	E	C	B	C
	Southbound	LT-TH	D	D	D	D	E	E	D	-	E	-	-	-
		RT	D	D	D	D	E	E	D	B	E	B	B	C
Ward Ave.	Eastbound	LT	E	E	E	E	E	E	F	E	F	E	E	E
		TH-RT	C	E	D	D	E	E	D	D	F	E	E	E
	Westbound	LT	E	E	E	E	E	E	E	E	F	E	E	E
		TH	E	D	E	E	D	D	F	E	D	D	E	D
		RT	C	D	C	C	C	C	C	C	C	C	C	C
	Northbound	LT	E	E	E	E	E	E	E	E	E	E	E	E
		TH	E	E	E	E	E	E	E	E	E	E	E	E
		RT	E	E	E	E	E	E	F	E	F	E	E	E
	Southbound	LT	E	E	E	E	E	E	F	E	F	E	E	E
		TH	E	E	E	E	E	E	F	E	F	E	E	E
		RT	E	E	E	E	E	E	F	E	F	E	E	E

TABLE 2
Ilalo Street Projected Traffic Operating Conditions

Intersecting Street	Traffic Movement		Year 2009				Year 2014				Year 2025	
			AM		PM		AM		PM		AM	PM
			w/out Imp.	w/ Imp.	w/out Imp.	w/ Imp.	w/out Imp.	w/ Imp.	w/out Imp.	w/ Imp.	w/ Imp.	w/ Imp.
Forrest Ave.	Eastbound	LT-TH-RT	F	C	B	B	D	B	C	B	B	B
	Westbound	LT-TH-RT	B	B	F	C	B	B	F	C	B	D
	Northbound	LT	B	B	C	C	B	C	F	C	C	D
		TH-RT	B	A	C	B	B	C	B	B	C	B
	Southbound	LT	B	B	B	B	B	C	B	C	C	C
		TH-RT	B	B	B	B	B	C	B	C	C	D
Keawe St.	Eastbound	LT-TH-RT	F	B	B	B	B	B	C	B	B	B
	Westbound	LT-TH-RT	B	B	C	B	C	B	B	C	B	C
	Northbound	LT	B	B	E	D	E	B	B	C	B	C
		TH-RT	B	A	E	B	B	B	B	B	B	B
	Southbound	LT	B	A	B	A	B	B	A	B	B	B
		TH-RT	B	B	B	B	B	B	B	B	B	B
Coral St.	Eastbound	LT-TH	B	A	B	A	A	A	A	A	B	A
	Westbound	TH-RT	A	-	A	-	-	-	-	-	-	-
	Southbound	LT	A	B	A	B	C	C	C	C	C	C
		RT	A	A	A	A	A	B	B	B	B	B
Cooke St.	Eastbound	LT-TH-RT	A	A	A	A	A	B	B	B	B	B
	Westbound	LT-TH-RT	A	A	A	A	A	B	B	B	B	B
	Northbound	LT	A	A	A	A	A	A	A	B	B	B
		TH-RT	A	A	A	A	A	A	A	B	B	B
	Southbound	LT	A	A	A	A	A	A	A	B	B	B
		TH-RT	A	A	A	A	A	B	A	B	B	B
Koula St.	Eastbound	LT-TH	-	-	-	-	A	A	A	A	A	A
	Southbound	LT	-	-	-	-	B	B	B	B	C	B
		RT	-	-	-	-	A	B	A	A	B	A
Ahui St.	Eastbound	LT-TH-RT	-	-	-	-	A	A	B	B	A	C
	Westbound	LT-TH-RT	-	-	-	-	A	A	B	B	B	B
	Northbound	LT	-	-	-	-	A	A	B	B	B	C
		TH-RT	-	-	-	-	A	A	C	C	A	C
	Southbound	LT	-	-	-	-	A	A	A	A	B	B
		TH-RT	-	-	-	-	A	A	B	B	A	B

intersection with Punchbowl Street are anticipated to operate at LOS "D" or better while those at the intersections with Keawe Street and Ward Avenue are anticipated to continue to operate at LOS "E" or better during the PM peak period.

Along Ilalo Street, traffic operations are anticipated to operate at adequate levels despite significant increases in traffic volumes due to forecast development. During the AM and PM peak periods, traffic movements at the intersections of Coral Street and Cooke Street are anticipated to operate at LOS "B" or better while movements at the intersection with Forrest Avenue are anticipated to operate at LOS "C" or better. At the intersection with Keawe Street, traffic operations are anticipated to operate well at LOS "B" or better during the AM and PM peak periods, except for the north-bound left-turn traffic movement which is expected to operate at LOS "D" during the PM peak period.

<u>Year 2009 Mitigation Measures</u>
The following actions are recommended to mitigate traffic impacts in 2009. Recommended improvements for Ilalo Street for 2009 are illustrated in Figure 9.

1. Maintain adequate turning radii at all roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.
2. Maintain adequate sight distances for motorists to safely enter and exit all roadways.
3. Extend Punchbowl Street from Ala Moana Boulevard to Ilalo Street. At the intersection with Ala Moana Boulevard, provide three northbound left-turn lanes.
4. Modify Ala Moana Boulevard west of its intersection with Punchbowl Street to provide an exclusive right-turn lane for vehicles turning right onto the new Punchbowl Street extension, as well as an additional westbound departure lane from the intersection. The additional departure lane will provide a free right-turn movement for the outer southbound right-turn lane along Punchbowl Street.
5. Restrict pedestrian crossings on the west side of the intersection of Ala Moana Boulevard and Punchbowl Street. Crossings will be allowed across the east, north, and south sides of the intersection.
6. Modify the traffic signal timing and phasing at the Ala Moana Boulevard and Punchbowl Street intersection to accommodate a four-way intersection.
7. Provide two lanes of traffic in each direction along Ilalo Street with shared through and turning lanes provided at each intersection along its length.
8. Restrict access along Ilalo Street from adjacent parcels. Access points for adjacent parcels should be located along intersecting streets.
9. Prohibit parking along Ilalo Street.
10. Provide exclusive left-turn lanes on the northbound and southbound approaches at the intersections along Ilalo Street.

11. Provide all-way stop intersection control at the following intersections along Ilalo Street: Forrest Avenue; Keawe Street; Cooke Street; Ahui Street.
12. Provide two-way stop intersection control at the following intersections along Ilalo Street: Coral Street; Ohe Street; Koula Street.

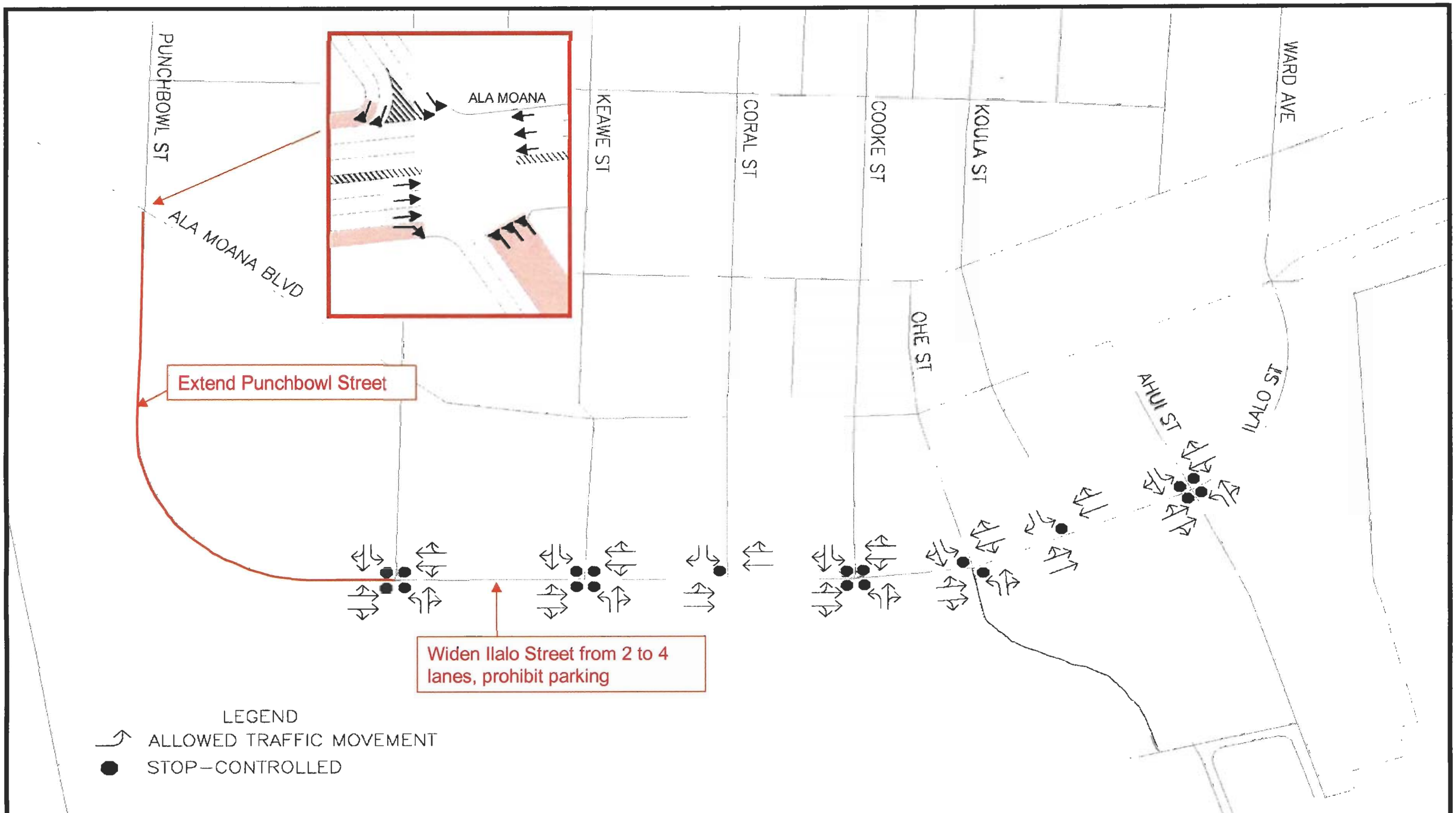
Year 2014 Projected Traffic Conditions

By 2014, traffic-operating conditions in the vicinity of the Makai Area are expected to worsen due to continued development, particularly in the Kewalo Basin waterfront area. Without mitigation, most of the traffic movements at the intersections of Ala Moana Boulevard and Keawe Street, Coral Street, and Ward Avenue are anticipated to operate at an unacceptable LOS “F” during the PM peak period. In addition, the north-bound left-turn traffic movement at the intersection of Ilalo Street and Keawe Street is anticipated to operate at an unacceptable LOS “E” during the AM peak period and the westbound approach and the north-bound left-turn movement at the intersection of Ilalo Street and Forrest Avenue is anticipated to operate at LOS “F” during the PM peak period. Due to anticipated increases in traffic, modifications may be required to intersections along Ala Moana Boulevard and Ilalo Street. Ala Moana Boulevard and Ilalo Street AM and PM peak hour traffic operating conditions with and without mitigation for 2014 are summarized in Tables 1 and 2 respectively.

Year 2014 Mitigation Measures

The following actions are recommended to mitigate traffic impacts in 2014. Improvements to Ala Moana Boulevard for 2014 are illustrated in Figure 10:

1. Maintain adequate turning radii at all roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.
2. Maintain adequate sight distances for motorists to safely enter and exit all roadways.
3. Prohibit north- and south-bound left-turn and through traffic movements at the following intersections along Ala Moana Boulevard: Keawe Street; Coral Street; Koula Street.
4. Prohibit eastbound and westbound left-turn traffic movements at the following intersections along Ala Moana Boulevard: South Street/Forrest Avenue; Keawe Street; Coral Street; Koula Street.
5. Consider converting the existing left-turn lanes/striped median along Ala Moana Boulevard to a raised median to provide shelter for crossing pedestrians.
6. Prohibit parking along Cooke Street between Ala Moana Boulevard and Ilalo Street to provide two lanes in each direction along that segment.



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KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

YEAR 2009 RECOMMENDED IMPROVEMENTS SCHEMATIC LAYOUT ILALO STREET

FIGURE 9

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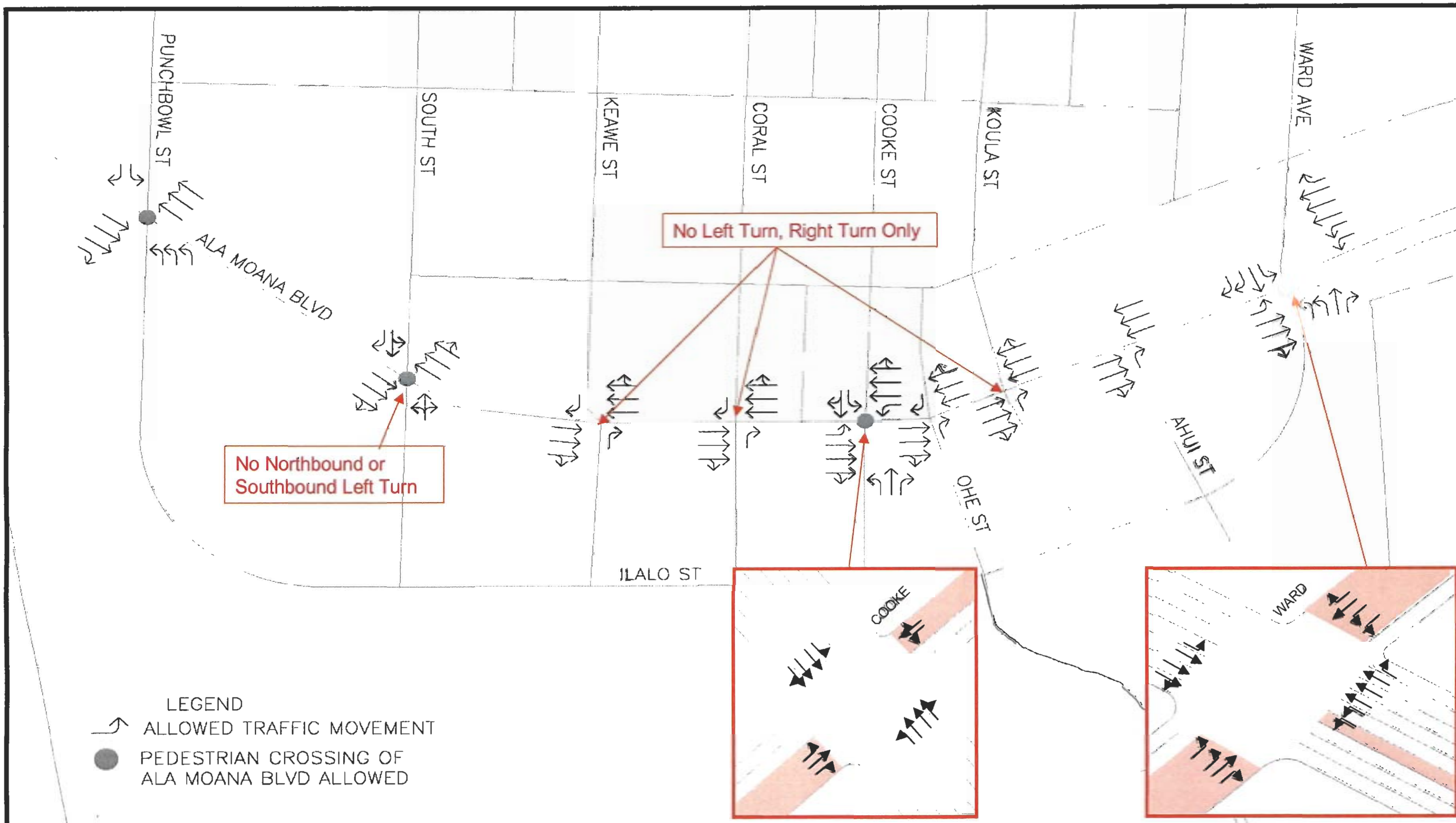

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KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

YEAR 2014 RECOMMENDED IMPROVEMENTS SCHEMATIC LAYOUT
ALA MOANA BOULEVARD

FIGURE 10

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7. Modify the existing lane use along Cooke Street north of Ala Moana Boulevard to provide an exclusive south-bound left-turn lane and a shared through and right-turn lane.
8. Provide exclusive north-bound left-turn, through, and right-turn lanes along Cooke Street south of Ala Moana Boulevard.
9. Verify the length of the left-turn lanes along Ala Moana Boulevard at the intersection of Cooke Street to provide adequate storage for vehicles at that intersection.
10. Modify the existing lane use along Ward Avenue north of Ala Moana Boulevard to provide one north-bound departure lane, two exclusive south-bound left-turn lanes, and exclusive through and right-turn lanes.
11. Provide two exclusive north-bound left-turn lanes and exclusive through and right-turn lanes at the intersection of Ala Moana Boulevard and Ward Avenue/Ilalo Street.
12. Provide two westbound left-turn lanes along Ala Moana Boulevard for vehicles turning left onto Ilalo Street.
13. Modify the traffic signal timing and phasing at the intersections of Ala Moana Boulevard with Cooke Street and Ward Avenue to accommodate the modified lane configurations.
14. Conduct full traffic signal warrant studies for the intersections of Ilalo Street with Forrest Avenue, Keawe Street, Cooke Street, and Ahui Street after 2009. Install traffic signal systems where warranted. Preliminary application of the warrants indicate the potential need for a traffic signal system at the intersections with Forrest Avenue and Keawe Street.

With mitigation, including lane usage and intersection control modifications, traffic operations along Ala Moana Boulevard are expected to remain similar or improve from 2009 conditions. Traffic movements at the intersection of Punchbowl Street are anticipated to operate at LOS "D" or better during the AM and PM peak periods and the intersections of South Street/Forrest Avenue, Cooke Street, and Ward Avenue are anticipated to operate at LOS "E" or better during the AM and PM peak periods. At the intersections of Keawe Street, Coral Street, Ohe Street, and Koula Street, traffic along Ala Moana Boulevard is anticipated to operate well since vehicles will be allowed to flow through the intersection freely.

With regard to Ilalo Street, traffic movements at the intersection of Cooke Street are anticipated to operate at LOS "B" or better during the AM and PM peak periods while movements at the intersections of Coral Street, Koula Street, and Ahui Street are anticipated to operate at LOS "C" or better during the AM and PM peak periods. At the intersections of Ilalo Street and Forrest Avenue and Keawe Street, traffic operations are anticipated to operate at LOS "C" or better during both peak periods due to the installation of traffic signal systems at those intersections.

<u>Year 2025 Projected Traffic Conditions</u>
By 2025, traffic operating conditions along Ala Moana Boulevard are expected to be impacted due to anticipated ambient traffic growth and development in the remainder of the Makai Area. The traffic movements at the intersections with Punchbowl Street, Cooke Street, and Ward Avenue are anticipated to operate at LOS "E" during the AM and PM peak periods. The eastbound, northbound and southbound approaches of the intersection of Ala Moana Boulevard and South Street/Forrest Avenue are anticipated to operate an LOS "F" during the PM peak period. Ala Moana Boulevard AM and PM peak hour traffic operating conditions with mitigation for 2025 are summarized in Table 1. 2025 AM and PM peak hour operating conditions with mitigation for Ilalo Street are summarized in Table 2.

<u>Year 2025 Mitigation Measures</u>
The following actions are recommended to mitigate traffic impacts in 2025:

1. Maintain adequate turning radii at all roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.
2. Maintain adequate sight distances for motorists to safely enter and exit all roadways.
3. Prohibit north- and south-bound left-turn traffic movements at the intersection of Ala Moana Boulevard and South Street/Forrest Avenue.
4. Reassess the traffic signal warrant studies previously conducted for the intersection along Ilalo Street where traffic systems were not warranted in 2014. Install traffic signal systems where warranted.

With the mitigation measures, all traffic movements, including those at the intersection of Ala Moana Boulevard and South Street/Forrest Avenue, are anticipated to operate at LOS "E" or better during the AM and PM peak periods.

3.3.1.3 Existing Bus and Bikeway Systems

A number of city bus trunk routes provide public transit access to the Makai Area. Most of these routes operate along Ala Moana Boulevard, although several of the routes also operate along Ward Avenue or Punchbowl Street. Bus service has also recently been implemented along Ilalo Street to accommodate the anticipated redevelopment of the Makai Area. During peak hours, passenger loads on all routes are high, with some routes experiencing high loads throughout the day.

The city also operates a paratransit service, TheHandi-Van, that provides service to disabled persons who are unable to ride the bus. TheHandi-Van provides curb-to-curb service to registered eligible users. Service areas and operating hours are the same as for the bus service.

Ala Moana Boulevard, Ward Avenue, South Street, and Punchbowl Street are designated as bicycle routes. Currently, there are no marked bicycle lanes or bicycle paths along these streets. Shared-use paths that may be used by bicyclists traverse through the Makai Gateway Park, Kakaako Waterfront Park, and the Kewalo Basin Park.

Impact and Mitigation Measures

The new developments proposed in the Makai Area plan are expected to contribute to passenger boardings and alightings to bus routes serving the Makai Area. The new developments will also likely increase demand for TheHandi-Van service in the Kakaako area. To some extent, impacts to the bus will be mitigated by the mixed-use nature of the Kakaako Makai Area which will enable residents to walk to shopping, dining, employment, and recreational destinations. In addition, long-range plans for public transportation include the potential provision of a shuttle service that would connect the Makai Area with the Kakaako Mauka Area, downtown Honolulu and Aloha Tower.

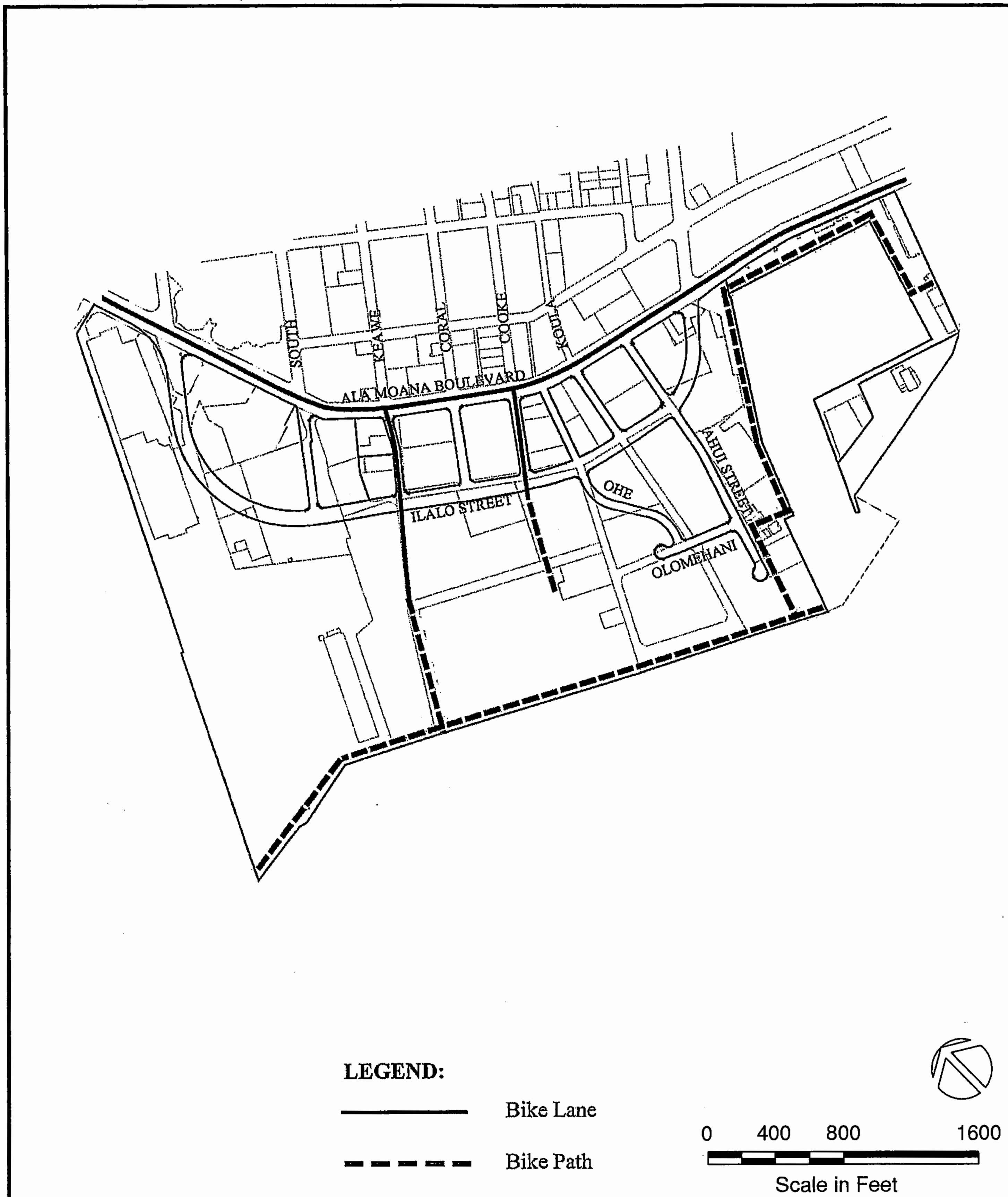
The Bicycle Facilities Plan for the Kakaako Makai Area is provided in Figure 11. Additional bicycle facilities proposed in the Makai Area Plan include bike lanes along Keawe and Cooke Streets leading to Kakaako Waterfront Park. A bike path will also traverse along the waterfront in the Makai Area and will connect to Ala Moana Park at the east end of Kewalo Basin. The plan is consistent with the Honolulu Bicycle Master Plan's "Lei of Parks" concept plan that proposes using shared-use paths to link parks. In order to encourage bicycle use, the HCDA requires bicycle racks, bicycle storage areas, and other bike accessories within development projects.

3.3.1.4 Existing Pedestrian Network

The Pedestrianways Plan for the Makai Area is shown in Figure 12. Much of the network, including the Mauka-Makai Promenade, portions of the Ilalo Street Promenade, and portions of the Waterfront Promenade, have been completed. All of the roadways that have been improved by the HCDA in recent years, such as Ilalo, Coral and Cooke Streets, have sidewalks and planter strips. Improvement District 12, which among other improvements will provide sidewalks along Ahui, Olomehani and Ohe Streets, is expected to be completed in December 2006.

Impact and Mitigation Measures

The pedestrian network in the Makai Area will continued to be improved by the HCDA as improvement district projects are implemented. In addition, the HCDA encourages developers to integrate their projects into the pedestrian network to facilitate pedestrian mobility. For example, the new John A. Burns School of Medicine provides walkways to



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Kakaako Makai Area Plan Amendment

Bicycle Facilities Plan

FIGURE 11

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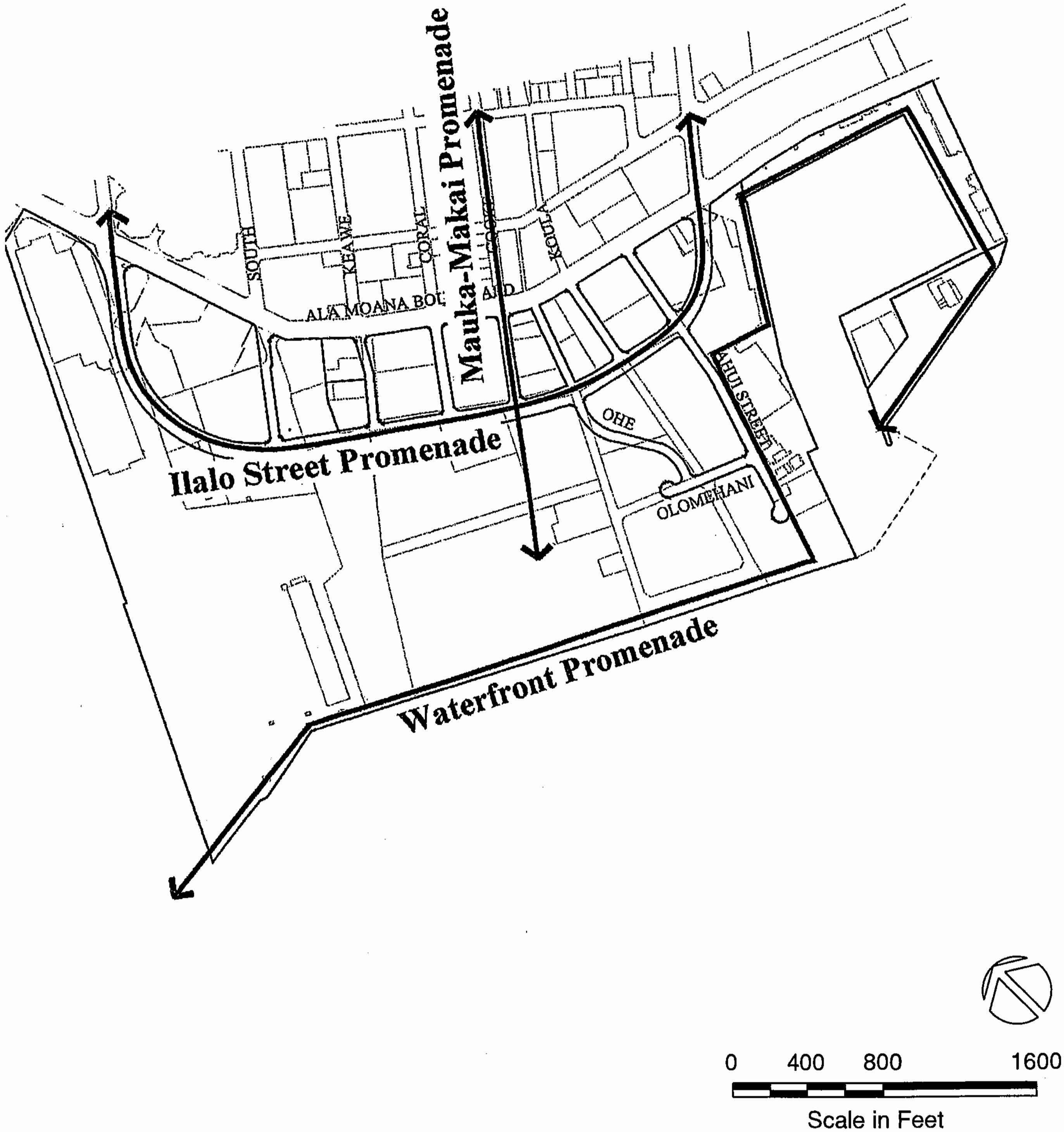

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Kakaako Makai Area Plan Amendment

Pedestrianways Plan

FIGURE 12

Ilalo Street, Cooke Street and the Kakaako Waterfront Park. The proposed addition of residential use in the Makai Area could enhance pedestrian safety as residents would provide more "eyes on the street" during both day and night hours.

3.3.2 Water System

At present, main distribution water lines are located along Ala Moana Boulevard, Ilalo Street, Ohe Street, Ahui Street and in the Fort Armstrong area. Smaller waterlines are located along Keawe, Koula, and Ilalo Streets, and the Fort Armstrong area. All lines are maintained by the City and County of Honolulu, Board of Water Supply (BWS).

The Makai Area is served by the Bella Vista and Punchbowl Reservoirs, which provide water storage for a portion of peak hourly demands as well as emergencies. Major water pump stations which also service the project area during peak hours include the Kalihi and Beretania Stations.

Impacts and Mitigation Measures

At full development, average water demand is projected to be approximately 916,000 gpd while projected maximum demand is projected to be approximately 1,375,000 gpd. Water supply allocation for proposed Kakaako Makai improvements will be obtained from the State Department of Land and Natural Resources which will either purchase water supply from the Board of Water Supply or develop new sources. Developers of parcels owned by the State or Kamehameha Schools will be required to obtain a water allocation for source from the respective landowner and they will be required to pay the BWS' Water System Facilities Charges. As required, the proposed water system improvements will be upgraded in accordance with the standards of the BWS. The HCDA will also explore alternative water systems such as the potential of accommodating a non-potable water system for irrigation purposes, thereby reducing water requirements.

The HCDA has implemented an Improvement District (ID) Program to systematically improve infrastructure in Kakaako. The ID Program is being used to reconstruct and/or widen streets with new streetlights, curbs, gutters and sidewalks. In addition, drainage, sewer and water systems are being improved and upgraded and telephone, electrical and cable televisions systems are also being upgraded and relocated underground. A list of recently completed and future ID Program projects for the Makai Area is provided in Table 3.

3.3.3 Wastewater System

Maintained by the City and County of Honolulu Department of Wastewater Management (WWM), the primary wastewater lines servicing the Makai Area are located along Ala Moana Boulevard, as well as Ward Avenue. Wastewater flows in the Makai Area are routed to a 36-inch line located in Ala Moana Boulevard which connects to the Ala Moana Pump Station located on Keawe Street. Two force mains, 60 and 78-inch lines, convey

TABLE 3
HCDA Improvement District Projects
Fiscal Year 2003-04 and Future Projects

Improvement District 8 Forrest Avenue Realignment	Location: Scope: Cost: Completed:	Forrest Avenue Realignment of Forrest Avenue with South Street to improve traffic flow across Ala Moana Boulevard and reconfigure the surrounding land into three development-ready parcels for commercial development. The project required a reconfiguration of a portion of the container yard. Existing sewer and water lines were relocated. $4.8 million September 2003
Improvement District 9 Ilalo Street Improvements	Location: Scope: Cost: Completed:	Ilalo Street, between Ahui and South Streets. Widening and enhancement to Ilalo Street from Ahui to South Streets; installation of new water, sewer and drainage systems; construction of new roadways; new driveways, sidewalks, curbs and gutters; installation of new utility lines. $ 22 million December 2003
Improvement District 12 Ahui/Ohe/Olomehani Streets Improvements	Location: Scope: Cost: Start: Est. comp:	Ahui Street, from Ilalo Street to the Point Panic Parking lot; Ohe Street, from Ilalo to Olomehani Streets; and Olomehani Street. Street widening/improvements/realignment and utility system enhancements. $15.6 million April 2005 December 2006

wastewater from the Ala Moana WWPS to the Sand Island WWTP. The average daily wastewater flow rate recorded between 2003 and 2004 through the Ala Moana WWPS was 52 million gallons per day.

<u>Impacts and Mitigation Measures</u>

Improvements to the Makai Area's wastewater system are being undertaken as part of the HCDA's improvement district program. The wastewater system is being upgraded to support full build-out of the Makai Area. The provision of residential use will not significantly affect the wastewater system since wastewater generated by residents will replace flows that would have been generated by commercial use.

3.3.4 Drainage System

Constructed as early as 1921, the drainage system in the Makai Area generally has not been designed to the present City and County standards and there is inadequate drainage along the existing roads and driveways.

Impacts and Mitigation Measures

During construction, runoff may enter the existing municipal drainage system particularly during rainy periods and sprinkling activities needed for dust control. Temporary cofferdams, debris-sediment traps or alternative methods may be employed at drainage outlets to mitigate potential water quality impacts. These measures will trap a majority of the sediment and debris which may otherwise flow to coastal areas. In addition, erosion control measures have been designed in conjunction with the Kakaako Waterfront Park. NPDES Permits will be required by the DOH for discharges to State waters as a result of construction clearing and grading, or construction dewatering activities, pursuant to Section 11-5-34.08(b) HAR. Drainage and Erosion Control Plans which specify appropriate mitigative measures will be prepared to control discharges of effluent resulting from both construction and dewatering activities. Where possible, Best Management Practices will be incorporated in open spaces and recreational areas to minimize the discharge of pollutants into Kewalo Basin and Mamala Bay from storm water runoff.

Improvements to the drainage system in the Makai Area are being undertaken as part of the HCDA's ID Program. New drainlines, catch basins, and drain inlets are being installed in conjunction with roadway improvements.

3.3.5 Solid Waste Collection and Disposal System

Private refuse collectors serve some commercial and industrial users in the area. City-collected solid wastes from the Honolulu District are hauled to a transfer station at Keehi and hauled to the Waipahu incinerator and/or the Campbell Industrial Park H-Power Plant for eventual disposal at the Waimanalo Gulch Sanitary Landfill.

Impacts and Mitigation Measures

Solid waste collection and disposal services for residential developments will be provided by private refuse service providers. In order to reduce solid waste, developers will be encouraged to incorporate diversion and reduction activities into its uses, such as providing separate trash bins for recyclable waste materials.

3.3.6 Power and Communication Systems

Power and communication requirements in the Makai Area are currently served by Hawaiian Electric Company, Inc. (HECO), Hawaiian Telecom and Oceanic Cablevision via overhead and underground systems.

Impacts and Mitigation Measures

Improvements to the Makai Area's electrical and communication utilities are being undertaken as part of HCDA's ID program. All existing overhead lines are being placed underground in concrete-encased ductlines. The provision of residential use is not expected to significantly affect electrical and communication systems since demands generated by residents will replace demands that would have been generated by commercial use.

3.3.7 Police, Fire and Civil Defense

Police protection services are provided by the Honolulu Police Department (HPD). The Makai Area is located within the Honolulu Metropolitan Police District 1 which extends from Hawaii Kai to Pearl City. District 1 headquarters is located on Hotel Street between Beretania and King Streets. Fire service is provided through the Honolulu Fire Department's (HFD) Kakaako, Pawaa, and Central stations. State Civil Defense currently has a siren located at the intersection of Ward Avenue and Ala Moana Boulevard.

Impacts and Mitigation Measures

During the short-term construction period, potential crime-related impacts may be mitigated through the use of locks, adequate lighting, barricades, and/or screening around the project site, in addition to hiring security personnel during evening, weekend and holiday hours. Coordination with the HPD will also be undertaken during construction to ensure public safety and to alleviate possible parking and traffic congestion problems. In the long-term, on-site security measures including well-designed and lighted areas and security personnel will further assist in reducing or preventing crime.

Prior to commencement of construction, building and construction plans will be submitted to the building and fire departments for permit review and approval. Development will comply with fire protection requirements of the HFD's Fire Prevention Bureau, including access for fire apparatus, water supply, and building construction. Fire accessibility of existing fire connections will be maintained.

The HCDA will continue to work with State Civil Defense to ensure that the Civil Defense warning system in the Makai Area is adequate.

3.3.8 Medical Services

Major medical service facilities in the vicinity of Kakaako include Queen's Medical Center located on the corner of Beretania and Punchbowl Streets, Straub Clinic and Hospital located on King Street and Ward Avenue, and the Kaiser Permanente Medical Center's Honolulu Clinic on Pensacola Street. The proximity of these major medical facilities indicate that adequate medical service will be available to Makai Area workers, residents and visitors.

3.3.9 Schools

Public schools which serve the Makai Area include Royal Elementary School located at the corner of Punchbowl and Lusitana Streets, Central Intermediate School located at Queen

Emma Street and Vineyard Boulevard, and McKinley High School located on the corner of King and Pensacola Streets, adjacent to the Neal Blaisdell Center. Kaahumanu Elementary School, which serves a portion of Kakaako Mauka and the Ala Moana area, is located on the corner of Beretania and Piikoi Streets. Based on information provided by the Department of Education's Facilities and Support Services Branch, Royal Elementary School presently has an enrollment of 407 students with a capacity for up to 430 students and Kaahumanu Elementary School has a current enrollment of 613 students with a capacity for up to 716 students. In addition, there are two public charter schools located in Kakaako, Voyager School which has an enrollment of 196 students and Myron Thompson Academy which has an enrollment of 900 students.

Impacts and Mitigation Measures

As discussed in section 3.2.2, at full build-out about 1,100 residential units may be constructed in the Makai Area. The burden on public schools, however, is expected to be less than that caused by a single-family development since all dwelling units will be condominiums or apartments. It is anticipated that many of the Makai Area residents will be empty nesters (older couples with adult children who have moved out), and couples and singles without children. Additionally, the U.S. census data shows that fifty-percent of the school age children in Kakaako attend private schools, which will further lessen the impact on the public school system if this trend continues.

The Department of Education's standard for projecting elementary school enrollment is 21 students per 100 new housing units. The residential demand study prepared for the Makai Area anticipates that up to 70 percent of buyers will be local residents with primary residence in the Makai Area. Since about 1,100 housing units may be built in the Makai Area, this translates to the need to accommodate 162 students. As enrollments are near capacity, the HCDA intends to coordinate educational facility requirements with the DOE to ensure that project demands on school facilities can be addressed. One near term option is to provide additional facilities for charter school operations. In addition, the former Pohukaina School property has been designated and planned as the site for a future elementary school.

4 RELATIONSHIP TO LAND USE PLANS AND POLICIES

4.1 Overview

This section describes the proposed action in relation to the applicable policies and controls of the Federal government, State of Hawaii, and City and County of Honolulu agencies.

4.2 Federal Policies and Controls

The following Federal policies and controls may be applicable to implementation of the proposed Makai Area Plan:

The Coastal Zone Management (CZM) Act (92-583), as amended and applicable implementing regulations. Within the State of Hawaii, the Coastal Zone Management Act is administered through the State Office of Planning. Further discussion of the state CZM program is provided in section 4.3.5.

National Historic Preservation Act (P.L. 89-665), and applicable implementing regulations. Buildings in the Makai Area on the National Register of Historic Places include the U.S. Immigration Station and former Ala Moana Wastewater Pump Station.

The Kakaako Peninsula's location on the Honolulu waterfront places it in proximity to aircraft departures from Honolulu International Airport. Under the proposed Makai Area Plan, the maximum building height within the Makai Area would be 200 feet. Based on an approach surface ratio of 50:1, the maximum allowable building height within the Makai Area is 300 feet. Federal Aviation Regulations (FAR) Part 77 sets forth standards for determining obstructions in navigable airspace, and requirements for notice to the Federal Aviation Administration (FAA). The FAR Part 77 is administered when navigable airspace may be affected by any object (erected or altered) with a height of more than 200 feet.

4.3 State Plans, Policies, and Controls

A number of State plans, policies and controls provide guidelines for development within the State of Hawaii. These guidelines include the Hawaii State Plan, State Functional Plans, State Land Use Districts, Coastal Zone Management, Honolulu Waterfront Master Plan, Kakaako Community Development District Plan and Conservation District Law. The following describes the relationship of the proposed action to these plans.

4.3.1 Hawaii State Plan

The Hawaii State Plan was developed to serve as a guide for future development of the State of Hawaii in the areas of population growth, economic benefits, enhancement and preservation of the physical environment, facility systems maintenance and development, and socio-cultural advancement, Chapter 226, Hawaii Revised Statutes (HRS) as amended. The Plan identifies the goals, objectives, policies and priorities for the development and growth of the State, for which guidelines have been provided to give direction to the overall development of the State.

The Makai Area Plan is consistent with the objectives and policies of the Hawaii State Plan. Described in the following sections are the relationship and compatibility of the proposed project with the overall plans for the State of Hawaii as set forth in the Hawaii State Plan.

4.3.1.1 Population (HRS §226-5)

[§226-5] Objectives 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 ... :*

(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 increased opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county"; ... and (4) "Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands".

The Makai Area Plan is consistent with population objectives as it encourages the development of physical, social and economic opportunities for the people of the State of Hawaii. The overall goal of the Makai Area Plan, to create a "people-oriented gathering place", directly relates to the population policies. By allowing residential use, the proposed amendment will enable residents to live, work, shop, and recreate in the same area.

Increased physical, social and economic opportunities will be provided by the development of commercial, social and recreational facilities. Numerous job opportunities will be created by the various uses, thereby increasing economic activity. The unique mix of passive and active social and recreational facilities will enhance the mental and physical well-being of the people in the community. People will be attracted to this area because of its amenities, social and recreational activities, employment opportunities, and proximity to the ocean, Downtown, and Waikiki.

4.3.1.2 Economy (HRS §226-6, -8, and -10)

[§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 ...: (a) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.*

(b) To achieve the general economic objectives, it shall be the policy of this State to: ... (6) Strive to achieve a sustained level of construction activity responsive to, and consistent with, state growth objectives; ... (14) Encourage businesses that have favorable financial multiplier effects within Hawaii's economy; and (15) Promote and protect intangible resources in Hawaii, such as scenic beauty and the aloha spirit, which are vital to a healthy economy".

[§226-10] "Objectives 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 Hawaii's economic base.*

(b) To achieve the potential growth activity objective, it shall be the policy of this State to: (1) Encourage investment and employment in economic activities that have the potential for growth such as ... marine-related industries; ... and (3) Enhance Hawaii's role as a center for ... education, culture, and the arts".

The proposed project will create numerous short-term and long-term employment opportunities. Short-term employment will be available during the course of construction. Diversified employment opportunities will be created by commercial and retail uses, as well as cultural, arts, educational and recreational facilities, with choices in the variety of indoor and outdoor jobs which will be created.

In addition to increasing employment opportunities, the diversity of planned uses will facilitate growth in educational, cultural and artistic programs. These uses will contribute to the mental and physical well-being of Hawaii's present and future generations.

4.3.1.3 Physical Environment (HRS §226-11, -12, and -13)

[§226-11] "Objectives and policies for the physical environment - land-based, 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 Hawaii's land-based, shoreline, and marine resources; and (2) Effective protection of Hawaii's unique and fragile environmental resources.*

(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of the State to: ... (2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems; (3) Take into account the physical attributes of areas when planning and designing activities and facilities; ... (8) Pursue compatible relationships among activities, facilities, and natural resources, especially within shoreline areas; and (9) Promote greater accessibility and prudent use of the shoreline for public recreational, educational, and scientific purposes."

[§226-12] "Objectives and policies for the physical environment - scenic, natural beauty, an historic resources. *(a) Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii'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;... (3) Promote the visual and aesthetic enjoyment of mountains, ocean vistas, scenic landscapes, and other natural features; (4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage; ... and (5) Encourage the design of developments and activities that complement the natural beauty of the islands."

[§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 Hawaii's land, air and water resources; and (2) Greater public awareness and appreciation of Hawaii's environmental resources.*

(b) To achieve the land, air, and water quality objectives, it shall be the policy of this State to: ... (2) Promote the proper management of Hawaii's land and water resources; (3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters; ... (5) Reduce the threat to life and property from erosion, flooding, tsunamis, earthquakes, and other natural or man-induced hazards and disasters; (6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities; (7) Encourage urban developments in close proximity to existing services and facilities; and (8) Foster recognition of the importance and value of the land, air, and water resources to Hawaii's people and their cultures."

Much care was taken in the planning of the Makai Area to achieve an aesthetically pleasing environment and a compatible relationship between land and water activities. The sculpting of the previous landfill mound has opened mauka-makai view corridors and expanded Diamond Head-Ewa view planes.

Building requirements will include at-grade open space, building setbacks, and view corridor setbacks. New high density developments are still required to have a minimum of 20 percent at-grade open space, which is intended to provide sufficient light and air on the ground and sufficient areas for pedestrian circulation and amenities, landscaping, and recreational space.

Building setbacks along the front, side and rear property lines affect the three-dimensional building form in a number of ways. Building setbacks provide safety measures for the general public's welfare. They also provide ground-level open space for sidewalk cafés, pedestrian-oriented shops, landscaping, pedestrian circulation and amenities, and provide view corridors between buildings and along streets. Furthermore, the landscaping and open lawns in the park areas will promote a sense of openness.

Three historic sites will be preserved -- the existing Immigration Station, the Department of Health Building, and the former Ala Moana WWPS. Future uses of the buildings should help to ensure protection of the structures. Preservation will be assured through provisions of the Makai Area Rules, as well as design guidelines proposed for transition areas.

4.3.1.4 Facilities Systems (HRS §226-14, 16 and -17)

[§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 utility 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 Hawaii's people through improvement priorities established through the planning process."

[§226-16] "Objectives 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 ... commercial ... and other needs within resource capacities.*

(b) To achieve the facility systems water objective, it shall be the policy of this State to: ... (2) Support research and development of alternative water sources; ... and (4) Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use."

[§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; and (2) A statewide transportation system consistent with planned growth objectives throughout the State.*

(b) To achieve the transportation objectives, it shall be the policy of this State to: ... (6) Encourage the use of transportation systems that serve as a means of accommodating present and future development needs of communities; ... (10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment."

[§226-18] "Objectives and policies for facility systems-energy/utilities. *(a) Planning for the State's facility systems with regard to energy/telecommunications shall be directed towards the achievement of the following objectives: (2) Increased energy self-sufficiency.*

(c) To further achieve the energy objectives, it shall be the policy of this State to: (3) Promote prudent use of power and fuel supplies through conservation measures including: (A) Development of cost-effective demand-side management programs; (b) Education; and (C) Adoption of energy-efficient practices and technologies."

The HCDA will continue to invest in significant improvements of public facility systems including drainage, wastewater and water systems. In particular, drainage improvements will provide marked improvements to the Makai Area which currently experiences spot flooding and ponding problems during periods of heavy rain. Implementation of the Makai Area Plan will also require the development of new water source and storage facilities to meet the potable water demands. The new water source will be developed in accordance with Chapter 20, Title 11, DOH Hawaii Administrative Rules (HAR) relating to potable water systems.

The HCDA will continue to improve the roadway system by widening roadways and installing curbs, gutters, sidewalks and street lighting. These improvements will greatly improve traffic circulation, pedestrian circulation and the overall appearance of the area. Implementation of roadway and utility improvements will be completed in accordance with applicable City and County of Honolulu and State Department of Transportation standards.

The Makai Area project will encourage efficient use of energy resources through conservation and recycling measures. Further, the project's design will consider incorporating waste diversion and reduction activities into facility design. Such design measures could include provisions for centralized storage and processing facilities in all buildings.

4.3.1.5 Socio-cultural Advancement (HRS §226-19, -21, -23, -25 and -26)

> ***[§226-19] "Objectives and policies for socio-cultural advancement - housing.*** *Planning for the State's socio-cultural advancement with regard to housing shall be directed towards achievement of the following objectives: (1) Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, livable homes located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals; and (2) The orderly development of residential areas sensitive to community needs and other land uses.*

(b) To achieve the housing objectives, it shall be the policy of this State to: (1) Effectively accommodate the housing needs of Hawaii's people..;… and (3) Increase homeownership and rental opportunities and choices…"

[§226-21] "Objectives 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.*

(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; (2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs."

[§226-23] "Objectives and policies for socio-cultural advancement - leisure. *(a) Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards 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: .. (2) Provide a wide range of activities and facilities to fulfill the recreation needs of all diverse and special groups; (3) Enhance the enjoyment of recreational experiences through safety measures, educational opportunities, and improved facility design and maintenance; (4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values; (5) Ensure opportunities for everyone to use and enjoy Hawaii's recreational resources; .. and (8) Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, and musical arts."

[§226-25] "Objectives and policies for socio-cultural advancement - culture. *(a) Planning for the State's socio-cultural advancement with regard to culture shall be directed towards achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawaii's people.*

(b) To achieve the culture objective, it shall be the policy of this State to: ... (2) Support activities and conditions that promote cultural values, customs, and arts that enrich the life styles of Hawaii's people."

[§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 achievement of the following objectives: (1) Assurance of public safety and adequate protection of life and property for all people; ... and (3) Promotion of a sense of community responsibility for the welfare and safety of Hawaii's people.*

(b) To achieve the public safety objective, it shall be the policy of this State to: ... (3) Ensure that public safety programs are effective and responsive to community needs; and (4) Encourage increased community awareness and participation in public safety programs."

Both publicly and privately owned lands within the project will allow for a contiguous mixed-use development for residential, commercial and recreational areas. Approximately 1,100 new residential units could be offered at affordable and market prices to accommodate a range of income levels. Residing adjacent to Downtown Honolulu, residents will have convenient access to employment, services and shops.

Recreational facilities such as the Children's Discovery Center, amphitheater, and variety of park environments provide healthy mental and physical enrichment to the general public. These facilities will help to meet the growing demand for a wide variety of social, cultural, educational and recreational activities that will be enjoyed by the community.

The Makai Area Plan provides safe public access to the ocean and along the water's edge. The improved traffic and circulation patterns within and around the area will also foster public safety.

The plan will encourage private sector redevelopment by providing sufficient infrastructure development to reduce the private sector risks and insure long-term project viability. Public/private sector development partnerships will also be encouraged. Revenue generating development which would attract private sector development would include the Kewalo Commercial area and mixed use areas.

4.3.1.6 Statewide Planning (HRS §226-52)

[§226-52] "Statewide Planning System. *(a) The statewide planning system shall consist of the following policies, plans, and programs: (1) The overall theme, goals, objectives, and policies established in this chapter that shall provide the broad guidelines for the State; (2) The priority guidelines established in this chapter that shall provide guidelines for decision-making by the State and the counties for the immediate future and set priorities for the allocation of resources. The formulation and revision of state functional plans shall be in conformance with the priority guidelines; (3) State functional plans that shall be prepared to address, but not be limited to, the areas of agriculture, conservation lands, education, energy, higher education, health, historic preservation, housing, recreation, tourism, and transportation. The preparing agency for each state functional plan shall also consider applicable federal laws, policies, or programs that* *impact upon the functional plan area. State functional plans shall define, implement, and be in conformance with the overall theme, goals, objectives, policies, and priority guidelines contained within this chapter. County general plans and development plans shall be taken into consideration in the formulation and revision of state functional plans; and (4) County general plans that shall indicate desired population and physical development patterns for each county and regions within each county. In addition, county general plans or development plans shall address the unique problems and needs of each county and regions within each county. County general plans or development plans shall further define the overall theme, goals, objectives, policies, and priority...*

(b) The statewide planning system shall also consist of several implementation mechanisms, including: (2) The state budgetary, land use, and other decision-making processes shall consist of: (D) Land use decision-making processes of state agencies. Land use decisions made by state agencies shall be in conformance with the overall theme, goals, objectives, and policies, and shall utilize as guidelines the priority guidelines contained within this chapter, and the state functional plans approved pursuant to this chapter. The rules adopted by appropriate state agencies to govern land use decision-making shall be in conformance with the overall theme, goals, objectives, and policies contained within this chapter."

4.3.1.7 Economic Priority (HRS §226-103)

[§226-103(f)] "Priority Guidelines for Energy Use and Development. *(1) Encourage the development, demonstration, and commercialization of renewable energy sources; and (2) Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy."*

The Makai Area project will incorporate efficient use of energy resources through conservation and recycling measures. Where feasible the project will utilize energy-efficient equipment to minimize energy costs. Further, the project's design will consider incorporating waste diversion and reduction activities into facility design. Such design measures could include provisions for centralized storage and processing facilities in all buildings.

4.3.2 State Environmental Policy (HRS §344)

[§344-4] "Guidelines. *In pursuance of the state policy to conserve the natural resources and enhance the quality of life, all agencies, in the development of programs, shall, insofar as practicable, consider the following guidelines: (7) Encourage the efficient use of energy resources."*

See comment in Section 4.3.1.7.

4.3.3 State Functional Plans

The Statewide planning system requires the development of State Functional Plans which are approved by the Governor of Hawaii. These plans were formulated to specify in greater detail the policies, guidelines and priorities set forth in the Hawaii State Plan. The State Functional Plans guide the implementation of State and County actions in the areas of: Energy, Transportation, Historic Preservation, Recreation, Health, Education, Housing, Tourism, Conservation Lands, Employment, Water Resources, Human Services, Education, Higher Education, and Agriculture. The following are objectives, policies and implementing actions as they relate to the Makai Area Plan:

4.3.3.1 State Energy Functional Plan

Objective A: Moderate the Growth in Energy Demand through Conservation and Energy Efficiency.

Policy A(1): Promote and Stimulate Greater Energy Efficiency and Conservation in Non-transportation Sectors.

Implementing Action A(1)(d): Provide Technical Assistance for Energy Conservation/Efficiency Projects for Residential and Commercial Projects.

Policy A(2): Stimulate and Promote Greater Energy Efficiency and Conservation in the Transportation Sector.

Implementing Action A(2)(a): Provide Assistance to Counties, Regional Transportation Management Associations and Major Employers in the Development of Ridesharing Programs.

Projects in the Makai Area will incorporate energy-efficient equipment and design where feasible. Such 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 and chillers, energy-efficient ballasts for all fluorescent lamps, building design which 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.

To conserve energy consumed by motor vehicles, landscaped sidewalks are planned to encourage greater use by pedestrians. Easy access to public transportation will encourage ridership and reduce the amount of energy used by motor vehicles.

In addition, the extensive amount of landscaping proposed throughout the Makai Area will reduce heat reflectants. Energy conservation devices or methods can be used to conserve energy. The use of solar water heaters and designing buildings to maximize indoor light without increasing heat will help to lessen electrical power demands. These design alternatives could include tinting of glass windows or landscaping around buildings to provide shade. Other newly developed energy efficient retrofits will also be encouraged during design.

4.3.3.2 State Transportation Functional Plan

Objective I.B: Reduction of travel demand through zoning and decentralization initiatives.

Policy I.B.1.: Close the gap between where people live and work through decentralization, mixed zoning, and related incentives.

Implementing Action I.B.1.c.: Promote the development of homes near jobs. Examples are residential condominiums in the Kakaako area to allow employees to live close to their downtown offices and employee housing built by resort developers in close proximity to resorts.

Objective II.A: Development of a transportation infrastructure that supports economic development initiatives.

Policy II.A.1: Support State economic development initiatives.

Implementing Action II.A.1.b: Complete acquisition of Kapalama Military Reservation. Develop incrementally to relocate industrial uses and to meet projected containerize cargo demand.

Situated in close proximity to Downtown Honolulu, the proposed new residential units in the Makai Area will provide close access to job centers for those residing in the development. These residences will also have convenient access to employment, services, and shops in the Makai Area.

To provide a safe, efficient and convenient movement of people and goods, roadway and harbor improvements will be provided. Significant upgrades to the roadway system will continue to be implemented. Harbor improvements include the expansion of cruise and passenger ship berths in the Pier 1 and 2 areas. Plans for this expansion will be consistent with the State's policy to foster and support commerce and other industries.

4.3.3.3 State Historic Preservation Functional Plan

Objective B: Protection of Historic Properties.

Policy B.2.: Establish and make available a variety of mechanisms to better protect historic properties.

Implementing Action B.2.b.: Support and assist the Counties to protect historic properties through zoning ordinances and other mechanisms.

The Immigration Station, Department of Health Building, and former Ala Moana WWPS which are listed on the National Register of Historic Places will be preserved. Although the use of these sites may be changed, the architectural integrity of the structures will be maintained.

4.3.3.4 State Recreational Functional Plan

Objective II-C: Improve and expand the provision of recreation facilities in urban areas and local communities.

Policy II-C(1): Meet the demand for recreational opportunities in local communities.

The Makai Area Plan provides a wide range of recreational opportunities to the public. Encompassing a large portion of the Makai Area, the recreation and open space component provides for active outdoor recreational facilities for the enjoyment of the community.

Outdoor recreational facilities will include pedestrian ways and various park environments. Water-related recreational opportunities include fishing and surfing areas, and sport fishing and dinner cruise boat facilities. These facilities will provide ample recreational opportunities for the community as a whole.

4.3.3.5 State Education Functional Plan

Cluster A(4): Services and Facilities.

Policy: Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.

Goal: Provide facilities that are sufficient in number, functional, well-paced and compatible with the physical surroundings.

Cluster B(4): Personal Development.

Policy: Support education programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.

Goal: Help schools effectively handle the whole length and breadth of required learning experiences.

The existing Mauka and Makai Area Rules require developers to provide a public facilities dedication contribution towards the development of necessary public amenities related to education, health, safety and welfare of the affected community populations. The HCDA will work with the Department of Education to ensure that adequate educational facilities are available to residents of the Makai Area.

4.3.4 State Land Use Districts

According to the State Land Use Commission, lands in the Makai Area are designated within the "Urban" District. The proposed plan is in conformance with Urban District standards.

Areas seaward of the shoreline are in the “Resource” Subzone of the “Conservation" District. The objective of this subzone is "to develop, with proper management, areas to ensure sustained use of the natural resources of those areas" (§13-2-13, Hawaii Administrative Rules). Uses within the Conservation District require a Conservation District Use Permit from the State Board of Land and Natural Resources.

4.3.5 Coastal Zone Management

Section 307 of the National Control Zone Management (CZM) Act of 1972 (16 USC 111451 et. seq.) provides for State review of Federal actions or permits affecting the coastal zone of states with approved CZM programs. Hawaii's CZM program, established pursuant to Chapter 205A, HRS, is administered by the State Office of Planning (OP) and provides for the beneficial use, protection, and development of the State's coastal zone. A CZM Federal Consistency Review would be required in conjunction with the Department of the Army Permit, for improvements extending into the water. Prior to issuance of the Federal Permit, the OP must determine the project's consistency with the enforceable policies of the Hawaii CZM Program. These policies encompass broad concerns such as impact on recreational resources, historic and archaeological resources, coastal hazards, and the management of development. The relationship of the CZM objectives and policies as they apply to the Makai Area are summarized as follows:

[§205A-2] *Coastal zone management program objectives.*

(1) Recreational resources - provide coastal recreational opportunities accessible to the public;

(2) Historic resources - 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;

(3) Scenic and Open Space Resources - Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources;

(4) Coastal ecosystems - Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems;

(5) Economic uses - provide public or private facilities and improvement important to the State's economy in suitable locations;

(6) Coastal hazards - Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, and subsidence; and

(7) Managing development - Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

The recreation objective will be satisfied by creating diverse recreational opportunities in a variety of park environments available for public use. The Kakaako Waterfront Park and Kewalo Basin Park provide significant shoreline park resources with full public access for fishing and picnicking activities.

The historic resource objective will be satisfied by the preservation of three historic sites within the Makai Area. These sites include the U.S. Immigration Station, the Department of Health Building, and the Ala Moana WWPS. These sites will either be preserved as is or refurbished while maintaining the architectural integrity of these buildings.

With respect to the scenic and open space resources objective, the formerly unsightly condition of the coastal area has been enhanced by opening up valuable view corridors, providing ample open space and landscaping, and improving the overall appearance of the area through the development of the Kakaako Waterfront Park.

The coastal ecosystems objective will be fulfilled by complying with water quality permits and conditions designed to protect coastal water quality.

The coastal hazards objective will be met through ongoing improvement of the drainage system. Portions of the current drainage system are inadequate and cause flooding problems during storms.

The enhancement of berthing areas and facilities for cruise ship, commercial fishing, and dinner cruise activities will help to support the economic uses objective relative to coastal dependent uses.

Relative to the managing development objective, adoption and implementation of the revised Makai Area Plan will involve extensive participation by the public, private interests, and government agencies. Short and long-term impacts resulting from this project are being disclosed to the public through this Environmental Assessment process. The development process will utilize and implement existing laws, and application for permits will be conducted in a timely manner.

4.3.6 Special Management Area and Shoreline Setback Variance

The State Office of Planning through HAR Title 1, Subtitle 1, OP, Chapter 2 (Rules Governing SMAs and Shoreline Areas within Community Development Districts) regulates development in the Special Management Area (SMA) of the Kakaako Community Development District. The Makai Area lies largely within the SMA as illustrated in Figure 13. Any "development" within the SMA boundary requires an SMA Use Permit administered by the OP. All phases of the project will be in accordance with the rules and regulations of the SMA.

The objectives of the State's CZM Program are discussed in Section 4.3.5 above. Guidelines for review of an SMA Use Permit application include coastal and environmental considerations as flood hazards, recreational resources, coastal ecosystems, public shoreline access, wastewater management, and coastal views. An environmental assessment or EIS may also be required.

The State's shoreline setback law, also administered by the OP for the Kakaako Community Development District, prohibits virtually any development or related activity including the removal of sand, rocks and soil from the shoreline setback area, determined as a 40-foot strip of land mauka of the shoreline. OP is authorized to grant variances for construction that would encroach in the setback area within this development district. Variances may be granted based on consideration of a structure or activity being in the public interest, hardship to the applicant (if the proposed activity is not allowed), and the effect a structure or activity would have on natural shoreline processes, particularly with regard to shoreline erosion (excluding harbor areas). The Makai Area may require a Shoreline Setback Variance for proposed improvements at Piers 1 and 2 and Kewalo Basin. The Shoreline Setback Variance request may be processed concurrently with the SMA Use Permit.

Harbors development, normally exempt from the County Special Management Area and Shoreline Setback Variance permits, would be subject to these permits from the State Office of Planning.

4.3.7 Honolulu Waterfront Master Plan

The Honolulu Waterfront Master Plan was prepared by the then Office of State Planning and approved by the Governor in December 1989 as a comprehensive master plan for development and improvement of the six-mile coastal stretch of the Honolulu waterfront from Ala Wai Yacht Club to the Honolulu International Airport.

The Waterfront Master Plan contains physical, social and economic goals to improve the existing functional and operational aspects of maritime activities, economic/urban development, recreation/leisure and circulation, and transform the waterfront into a "people-oriented gathering place". To accommodate waterfront activities to the year 2010, the land use plan reorganizes the uses along the waterfront by relocating, expanding and creating facilities to accommodate maritime, urban, and recreational activities and improve the circulation pattern.

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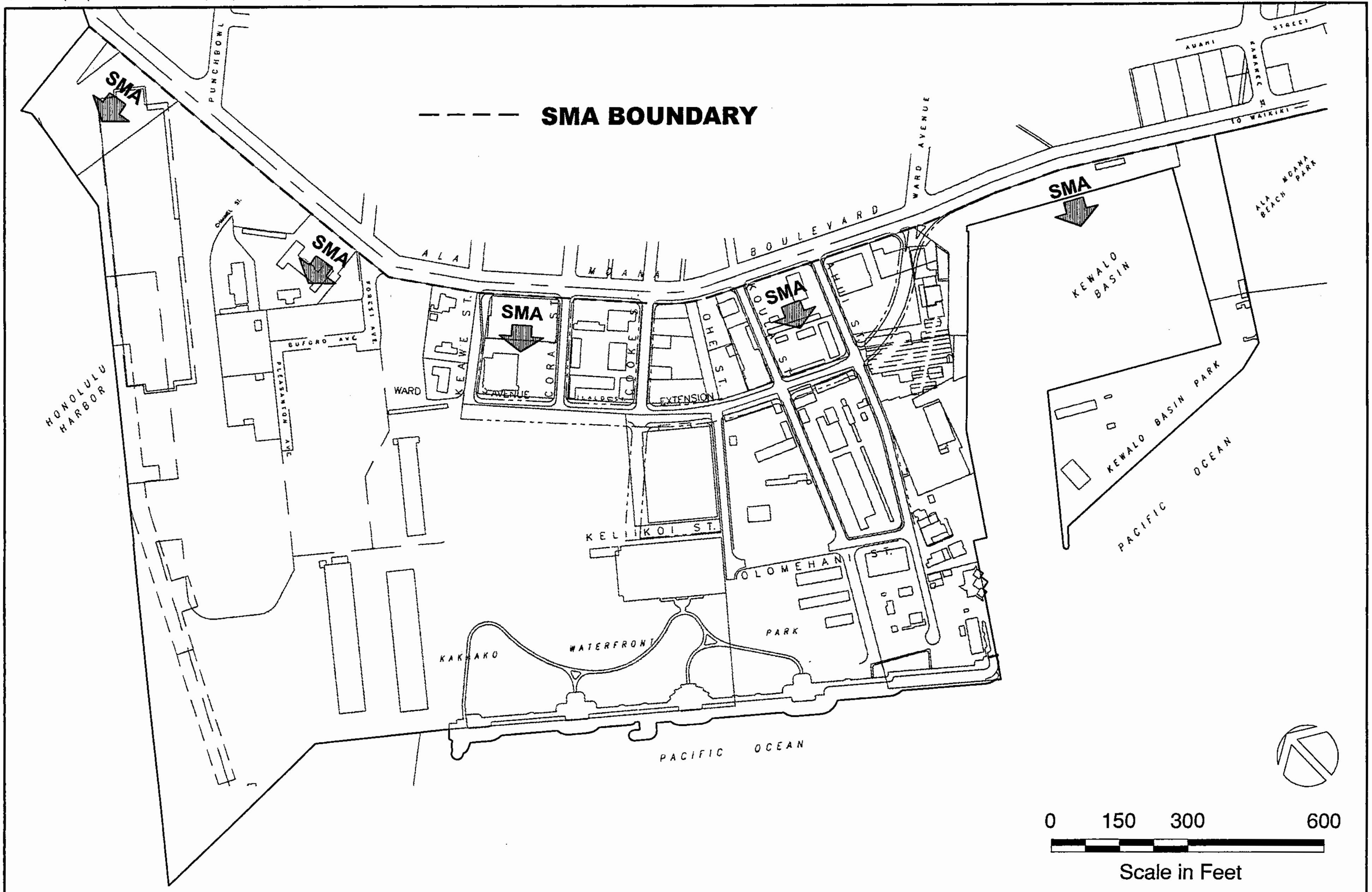

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Kakaako Makai Area Plan Amendment

Special Management Area Boundary

Figure 13

The overall land use pattern proposed by the Waterfront Master Plan promotes the Makai Area as a vibrant, centrally located people-oriented gathering place. The original 1983 Makai Area Plan was revised to reflect the changes recommended by the Waterfront Master Plan. The major components of the proposed Makai Area Plan are consistent with the Waterfront Master Plan.

4.3.8 Oahu Commercial Harbors 2020 Master Plan

The *Oahu Commercial Harbors 2020 Master Plan* was prepared by the State Department of Transportation in May 1997. The plan provides a general long-range guide for commercial harbor development using current economic indicators and anticipated future trends.

Facilities specified in the Oahu Commercial Harbors 2020 Master Plan within the Makai Area include a cruise ship terminal near Pier 2 and an overseas container cargo terminal at Fort Armstrong. In Kewalo Basin, the plan recommends a gradual transition to ocean-based tourist activities with commercial fishing being relocated to Honolulu Harbor and Keehi Lagoon.

The proposed Makai Area plan generally conforms to the Oahu Commercial Harbors 2020 Master Plan. The Pier 2 and Fort Armstrong areas have been zoned as “Mixed Use Zone-Industrial” and have been set aside for development of the proposed cruise ship terminal and for maritime industrial uses. The “Waterfront Commercial” zoning of Kewalo Basin will also promote a transition to ocean-based tourist activities.

4.3.9 Kakaako Community Development District

In 1976 the State Legislature created the Hawaii Community Development Authority (HCDA) to initiate and guide the timely revitalization of underdeveloped urban communities in the State. Kakaako was selected as the HCDA's first community development district. The State Legislature established development guidance policies which provide the planning basis for the Kakaako District and Makai Area. The proposed amendment to the Makai Area Plan is consistent with the purpose of the Kakaako Community Development District as stated in Chapter 206E-31, Hawaii Revised Statutes, which states “the authority shall plan a mixed-use district whereby industrial, commercial, residential, and public uses may coexist compatibly within the same area.”

4.3.9.1 Revisions to the Makai Area Plan

The original 1983 Makai Area Plan consisted of "Mixed Use Zone Commercial" (MUZ-C), "Mixed Use Zone Residential" (MUZ-R), Waterfront Industrial" (WI), and "Public Use Areas and Parks". The revised 1987 plan consisted of "Commercial", "Waterfront Commercial", "Recreational Commercial", "Waterfront Service", "Park", and "Public Facilities". The major difference in the two plans was the elimination of residential and industrial uses in the revised plan. The Honolulu Waterfront Master Plan study identified more suitable areas for Waterfront Industrial uses in Honolulu Harbor, and determined that Kakaako District's residential uses should be restricted to the Mauka Area, because of certain environmental and market concerns, such as the potential exclusion of lower income families from the Makai Area since higher land values would necessitate higher priced housing.

Concurrent with the waterfront master planning process in 1988 and 1989, HCDA was involved in updating the Makai Area Plan based not only on an expanded area, but also on current market, traffic, engineering and harbor planning studies. HCDA's participation was also critical to ensure that plans for the Makai Area were compatible with and supportive of the comprehensive Waterfront Master Plan. Subsequent to the finalization of the waterfront planning effort, the Makai Area Plan and Rules were revised to reflect the recommended changes.

Revisions to the Makai Area Plan proposed in 1994 mainly related to land use, the transportation network, and open space. Relative to land use, a mixed land use concept was proposed to enable residential uses in the Makai Area. The transportation network was reevaluated to accommodate two major couplets (pair of one-way streets) for Ala Moana Boulevard/Ward Avenue, and Cooke/Koula Streets. The previously proposed large superblocks were replaced with smaller blocks which were more conducive to incremental development and which would have improved the relationship of the Mauka and Makai Areas. The earlier planned inland waterway system was deleted and replaced by a system of open spaces and pedestrianways. The open space and recreation plan was reoriented to lend a stronger focus to a central promenade extending up from the waterfront park to better connect the Mauka and Makai Areas. Several blocks above Ala Moana Boulevard along Cooke Street were proposed to be added to the Makai Area boundary to continue and reinforce the central promenade theme up through the Mauka Area. The 1994 proposed revisions, however, were not adopted by the HCDA.

The current Makai Area Plan, adopted in 1998, continues the basic themes specified in the 1994. Major changes included the elimination of the residential component of the plan and modification of the transportation system. The proposed Ala Moana Boulevard/Ward Avenue, and Cooke/Koula Streets one-way couplets were eliminated. Instead, Ilalo Street has been designated the main collector street for the Kakaako Makai area. The proposal to add several blocks above Ala Moana Boulevard in the Kakaako Mauka area to the Kakaako Makai Area boundary was eliminated.

The proposed revisions to the Makai Area Plan continue the concepts of the 1998 plan, however, the additional of residential use will further the goal of creating a people-oriented, mixed-use urban village.

4.3.9.2 Revisions to the Makai Area Rules

The purpose of the Makai Area Rules is to enable the HCDA to implement the policies and programs relating to the Kakaako District. Revisions to the January 1988 Kakaako District Rules, which covered both Mauka and Makai Areas, included the following:

- Retained general language relative to the entire district was retained.
- References to the Waterfront Master Plan and the Aloha Tower Development Corporation added, and language related to the Mauka Area was removed.
- Language relating to the Makai Area was amended to conform with the recommendations of the October 1989 Draft Makai Area Plan.
- The Makai Area Rules were developed as a separate document which supports the recommendations of the Honolulu Waterfront Master Plan and Revised Makai Area Plan.

The original Makai Area land use zone rules featured the MUZ-C, MUZ-R, and WI zones, which were most recently replaced in 1998 with Commercial (C), Waterfront Commercial (WC), Public Use (PU), and Mixed-Use Zone-Industrial (MUZ-I) zones. The Makai Area Rules regulate allowable uses within these zones and establish development standards such as size, density, setbacks, open space, parking, and landscaping. The proposed revision to the Makai Area Plan would replace with Commercial designation with the Mixed Use Zone (MUZ) designation. The Makai Area Rules would be amended to allow residential use in the WC zone. Building height and density limits would remain the same, except for the Waterfront Commercial zoned area on the west end of Kewalo Basin where the height limit is being increased from 45-feet to 65-feet.

4.4 County Plans, Policies, and Controls

Pursuant to Act 153, SLH 1976, authority was granted by the Legislature to the HCDA to supersede County ordinances. With the adoption of the Kakaako District and existing Makai Area Plans and Rules, the HCDA has overridden certain local controls such as the Development Plan and Zoning. The Kakaako Plans, however, will foster the goals of both the State Plan and the County General Plan.

4.4.1 Primary Urban Center Development Plan

The City and County of Honolulu's Primary Urban Center Development Plan (PUC-DP) establishes policy to shape the growth and development of the primary over the next 20 years. The PUC-DP recognizes that one key redeveloping area is Kakaako and projects that Kakaako will absorb about 30 percent of the PUC's future residential growth, and a large portion of commercial growth. Although the HCDA is not required to conform to the City's PUC-DP, the proposed amendments to the Makai Area Plan and Rules are consistent with the vision for the Kakaako area stated in the PUC-DP. Relevant sections of the PUC-DP are as follows:

> 3.3.1.2 Development of New Housing
>
> The PUC is essentially "built-out", i.e., there is no reservoir of vacant land designated for future urban use. New housing is developed on lands which are under-utilized or where it is not economical to maintain the existing uses or

> structures. This occurs primarily in older in-town districts where land values are relatively high and there is a strong market demand for higher use.
>
> One key redeveloping area is Kakaako, which is zoned and regulated by the State's Hawaii Community Development Authority. HCDA has invested in improving infrastructure in order to support higher-density residential and mixed-use development. Based on plans developed in the late 1970's, more than $125 million has been spent on infrastructure improvements in four improvement districts. The comprehensive program has included improvements to roadways, drainage facilities, sewers, water lines, and electrical and communication lines. The State of Hawaii underwrote 80 percent of the cost, with the remainder paid by property owners and utility companies.
>
> With infrastructure in place and with large blocks of land controlled by large landowners, Kakaako is projected to absorb about 30 percent of the PUC's future residential growth, as well as a large portion of commercial growth. Kakaako regulations provide for a maximum floor area ratio (FAR) of 3.5 to 3.8 for "Planned Developments," compared to 1.9 FAR for A-2 Medium Density Apartment zoning, and 2.8 FAR for A-3 High Density Apartment zoning under the City's Land Use Ordinance.

Thus, the proposed amendment to allow residential use in the Makai Area is consistent with the PUC-DP and will help to enable the Kakaako Community Development District to absorb the residential growth projected by the PUC-DP.

The PUC-DP Land Use Map (A.5: Land Use Map PUC-Central) shows "Industrial", "District Commercial" and "Parks and Open Space" uses in the Makai Area. The map also shows a harbor facility in Kewalo Basin and a pedestrian network that traverses along Ala Moana Boulevard, makai along Keawe Street to the waterfront, east along the shoreline of the Kakaako Waterfront Park, and Mauka along the Kewalo Basin Waterfront up to Ala Moana Boulevard where it continues eastward.

The proposed amendments to the Makai Area Plan are generally consistent with the PUC-DP Land Use Map. The Industrial, Commercial and Parks and Open Space uses shown on the map will continue to be permitted. The Harbor facilities in Kewalo Basin will continue to be maintained and much of the Pedestrian Network shown on the map is already in place. The extension of the Pedestrian Network along Kewalo Basin from the Kakaako Waterfront Park to Ala Moana Boulevard is expected to be constructed during redevelopment of this area. As noted in Section 3.3.1.4 of this EA, the provision of residential use could enhance the pedestrian environment by providing a residential presence that could improve safety.

4.4.2 Zoning

The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the Oahu General Plan and the City's eight Development Plans and Sustainable Communities Plans. Under the current LUO zoning, the Makai Area is zoned as "Kakaako Community Development District".

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5 ALTERNATIVES TO THE PROPOSED ACTION

Alternatives to the proposed action were developed and evaluated against the planning objectives for the Makai Area Plan.

5.1 No Action Alternative: Existing Makai Area Plan

Under the no action alternative, implementation of the Makai Area would be pursued as provided by the existing Makai Area Plan. The HCDA would continue to improve the infrastructure in the Makai area and seek redevelopment of the area with commercial, waterfront commercial and public uses.

Pursuing the existing plan would forego opportunities to provide housing in the heart of Honolulu. Providing housing is viewed as an essential component for achieving the goal of creating an active waterfront community, or "urban village", in the Makai Area. Allowing residential use would contributes towards the livability and sustainability of Honolulu by providing homes for residents in an area conveniently situated near work, shopping, and recreational opportunities. Furthermore, the provision of housing would create a consumer market base that would help to support commercial developments in the Makai Area.

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6 REQUIRED PERMITS AND APPROVALS

The following are permits and approvals that may be required prior to project construction. Developers of projects in the Makai Area will be required to obtain permits and approvals as required.

<u>Federal</u>
Department of the Army
- Department of the Army Permit

Federal Aviation Administration
- FAA Airspace Review (Federal Aviation Regulations Part 77) for construction which may affect navigable airspace

<u>State of Hawaii</u>
Department of Land and Natural Resources
- Historic Sites

Department of Transportation
- Highway Construction and right-of-way approval
- Approval for utilities and traffic rerouting

Department of Health
- National Pollutant Discharge Elimination System (NPDES) Permit
- Noise Variance Permit
- Section 401 Water Quality Certification

Office of Planning
- Coastal Zone Management Federal Consistency review.
- Shoreline Setback Variance
- Special Management Area permit

<u>City and County of Honolulu</u>
Department of Planning and Permitting
- Building Permit
- Stockpiling Permit
- Grubbing Permit
- Grading Permit
- Demolition Permit
- Excavation Permit
- Effluent Discharge Permit

Board of Water Supply

- Water source

Other
Hawaiian Telecom
- Permit or concurrence regarding work on utility lines

Hawaiian Electric Company
- Permit or concurrence regarding work on utility lines

Gas Company
- Permit or concurrence regarding work on utility lines

Oceanic Cablevision
- Permit or concurrence regarding work on utility lines

7 DETERMINATION

Adoption of the proposed amendments to the Makai Area Plan are not anticipated to have a significant impact based on the criteria set forth in the State Department of Health Rules, Chapter 200, Title 11, Section 12. The Hawaii Community Development Authority has, therefore, issued a Finding of No Significant Impact (FONSI) for the project. The proposed project's relationship to each of the significance criteria is discussed below.

1. *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.*

Construction of improvements will involve an irrevocable commitment of labor, capital and materials. Once improved, lands in the Makai Area will also be committed for the foreseeable future. The Makai Area, however, does not possess any significant natural resources and access to cultural resources, such as the waterfront will be maintained. Historic buildings including the Department of Health Building, the U.S. Immigration Station, and the former Ala Moana WWPS will be preserved.

2. *Curtails the range of beneficial uses of the environment.*

The proposed amendments to the Makai Area Plan will expand the range of beneficial uses in the Makai Area. The provision of residential use will complement uses that are presently allowed in the Makai Area, including commercial, waterfront commercial, industrial and public uses.

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;*

The proposed amendments to the Makai Area Plan are consistent with the environmental policies, goals and guidelines set forth in Chapter 344, HRS. By permitting residential use within the urban core of Honolulu in a previously developed area, the proposed amendments will help to prevent sprawl and development of undisturbed lands.

4. *Substantially affects the economic or social welfare of the community or state.*

In the short-term, implementation of the Makai Area Plan will have beneficial economic impacts from the hiring of construction workers and purchasing of materials from local suppliers. In the long-term, the Plan will have beneficial impacts by providing housing opportunities for residents and expanding the State's economic base.

5. *Substantially affects public health.*

Potential short-term impacts to public health that may occur during construction will be mitigated by implementing appropriate Best Management Practices. Implementation of the Makai Area Plan will have no long-term significant adverse impact on public health.

6. *Involves substantial secondary impacts, such as population changes or effects on public facilities.*

The proposed amendment to the Makai Area Plan will not induce substantial secondary impacts such as population changes or effects on public facilities. The City and County of Honolulu's Primary Urban Center (PUC) Development Plan already recognizes that the Kakaako area is expected to absorb 30% of the population growth in the PUC area. The Makai Area is anticipated to undergo substantial redevelopment and public facilities are being upgraded to support growth in the area.

7. *Involves a substantial degradation of environmental quality.*

Implementation of the Makai Area Plan, including construction of dwellings, is not anticipated to involve a substantial degradation of environmental quality. Short-term impacts to air and water quality, ambient noise levels, and traffic operations may occur during the construction of the improvements. Impacts during construction will be mitigated by implementing appropriate Best Management Practices and complying with required permit conditions.

8. *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.*

The proposed amendment to the Makai Area Plan will not have a cumulative effect upon the environment nor does it involve a commitment for larger actions. The existing Makai Area Plan proposes substantial redevelopment in the Makai Area and public facilities are being upgraded to accommodate the anticipated growth in the area. Furthermore, the City and County of Honolulu's PUC Development Plan already anticipates substantial population growth in the Kakaako area.

9. *Substantially affects a rare, threatened or endangered species, or its habitat.*

There are no known proposed, candidate, or listed threatened or endangered species present at the project site.

10. *Detrimentally affects air or water quality or ambient noise levels.*

Short-term impacts to air and water quality and ambient noise levels may occur during construction of the proposed improvements. Noise impacts will be mitigated by properly muffling construction vehicles and equipment and complying with the conditions of the project's noise variance permit. Air quality impacts will be minimized by properly maintaining construction vehicles and equipment. Water quality impacts will be minimized by implementing appropriate Best Management Practices, such as installing silt fences, vegetating exposed areas, and directing runoff to detention basins..

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, freshwater, or coastal waters.*

Shoreline areas in the vicinity of Kewalo Basin and the Kakaako Waterfront Park are in the Tsunami Evacuation Zone. Civil Defense sirens have been installed in the Makai Area and the HCDA will continue to coordinate with the State Civil Defense to ensure that sufficient emergency preparedness measures are in place.

12. *Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.*

The proposed amendment that would increase the height limit in the Waterfront Commercial zone from 45 feet to 65 feet may marginally affect viewplanes. The impact, however, is not considered to be significant since viewplanes are currently blocked by structures and would continue to be blocked when the area is redeveloped.

13. *Requires substantial energy consumption.*

Projects in the Makai Area will incorporate energy-efficient equipment and design where feasible. Such design elements may include using individual meters for residential and commercial/retail uses to provide incentives for energy conservation, using energy-efficient ballasts for all fluorescent lamps, and installing energy-efficient metal halide lights for outdoor lighting.

To conserve energy consumed by motor vehicles, landscaped sidewalks will create a pedestrian-friendly environment and encourage walking, rather than driving, for short trips. In addition, providing convenient access to public transportation will encourage ridership.

Finally, the extensive amount of landscaping proposed throughout the Makai Area will reduce heat reflectants and cooling requirements. Other measures that could reduce electrical power demands for cooling include installing high-efficiency motors and chillers, designing buildings to maximize indoor light without increasing indoor heat, using insulation and double-glazed windows and doors, tinting glass windows, and landscaping around buildings to provide shade.

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8 CONSULTATION

8.1 Pre-Assessment Consultation

The following agencies and organizations were consulted during the preparation of the Draft EA. Comments received and responses are attached at the end of this EA.

State of Hawaii
Department of Health
Department of Transportation
Department of Land and Natural Resources
Office of Planning

City and County of Honolulu
Board of Water Supply
Department of Planning & Permitting
Department of Transportation Services
Ala Moana/Kakaako Neighborhood Board No. 11

Other
Kakaako Improvement Association
Kamehameha Schools

8.2 Draft Environmental Assessment Consultation

The Draft Environmental Assessment was distributed to the following agencies and organizations.

Federal
U.S. Fish and Wildlife Service
National Marine Fisheries Service
U.S. Army Corps of Engineers

State of Hawaii
Department of Business, Economic Development and Tourism
Department of Education
Department of Health (DOH)
DOH, Environmental Management Division
DOH, Office of Environmental Quality Control
Department of Land and Natural Resources (DLNR)
DLNR, Historic Preservation Division
Department of Transportation
Office of Hawaiian Affairs
Office of Planning
State Main Library
University of Hawaii, Environmental Center

City and County of Honolulu
Board of Water Supply
Department of Planning & Permitting
Department of Transportation Services
Ala Moana/Kakaako Neighborhood Board No. 11

Other
Hawaiian Electric Company, Inc.
Kakaako Improvement Association
Kamehameha Schools
Hawaiian Telecom
Oceanic Cablevision

8.3 Final Environmental Assessment Distribution

The Final EA will be distributed to the following agencies and organizations:

State of Hawaii
Department of Business, Economic Development and Tourism
Department of Education
Department of Health (DOH)
DOH, Office of Environmental Quality Control
Department of Transportation
Office of Hawaiian Affairs
Office of Planning
State Main Library
State Senator Gordon Trimble

City and County of Honolulu
Board of Water Supply
Department of Parks and Recreation
Department of Planning & Permitting
Department of Transportation Services
Ala Moana/Kakaako Neighborhood Board No. 11

Other
Kakaako Improvement Association

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9 REFERENCES

Hawaii Community Development Authority, State of Hawaii. Annual Report. Various dates.

Hawaii Community Development Authority, State of Hawaii. Makai Area Plan. November 2002.

Hawaii Community Development Authority, State of Hawaii. Waterfront Business Plan. October 2, 2002.

Mikiko Corporation. Residential Use and Demand Assessment for Kakaako Makai, Honolulu, Island of Oahu. May 2005.

State of Hawai‘i, Department of Business Economic Development and Tourism. State of Hawai‘i Data Book.

Wilson Okamoto and Associates. Infrastructure Master Plan for the Kakaako Community Development District Makai Area. Prepared for the Hawaii Community Development Authority. September 1998.

Wilson Okamoto and Associates. Kakaako Community Development District Makai Area Plan Final Supplemental Environmental Impact Statement. Prepared for the Hawaii Community Development Authority. June 1998.

Wilson Okamoto and Associates. Kakaako Community Development District Makai Area Plan Final Supplemental Environmental Impact Statement. Prepared for the Hawaii Community Development Authority. October 1994.

Wilson Okamoto and Associates. University of Hawaii Health and Wellness Center Final Environmental Assessment. Prepared for the University of Hawaii, John A. Burns School of Medicine. May 2002.

Wilson Okamoto Corporation. Transportation Plan Kakaako Community Development District Makai Area. Prepared for the Hawaii Community Development Authority. May 2005.

Comments Received During the

Pre-Assessment Comment Period

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
ACTING DEPUTY DIRECTOR
MARY LOU KOBAYASHI
ADMINISTRATOR
OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING
235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

RECEIVED
FEB 07 2005
WILSON OKAMOTO CORPORATION

Ref. No. P-10778

February 4, 2005

Mr. Rodney Funakoshi, AICP
Project Manager
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Funakoshi:

Subject: Environmental Assessment Pre-Assessment Consultation
Kakaako Community Development District
Makai Area Plan and Rules Amendment
Kakaako, Oahu, Hawaii

Thank you for your letter dated December 20, 2004, which requested comments on the proposed amendments to the Kakaako Makai Area Plan. The Office of Planning has reviewed the brief descriptive material provided and supports the proposed amendments to the Kakaako Makai Area Plan. We offer the following comments.

The amended Kakaako Makai Area Plan should address the need for multi-modal transportation alternatives to serve the proposed residential population of Kakaako Makai. Residents will need off-street parking, if retail businesses are to thrive. Otherwise workers and consumers who do not use public transportation will have to compete with residents for limited on-street parking.

Public safety will also be a key factor in a mixed residential and commercial district. The Area Plan should address the issue of creating street frontage without blank walls, with lots of "eyes", i.e. windows, at street level, and opportunities for businesses that will stay open into the evening, such as restaurants and coffee shops.

Affordable housing opportunities should be investigated to balance the residential population between service sector jobs and high tech jobs. A balance will reduce the need for transportation accommodations to bring workers into the area for service jobs, as shown in Waikiki.

HCDA has made an admirable effort to create green space and view planes in Kakaako Makai. A residential population could become advocates for preserving these amenities in the face of increased demand for land in Kakaako.

If you have any questions, please call Mary Alice Evans of the Land Use Division at 587-2802.

Sincerely,

Mary Lou Kobayashi

Mary Lou Kobayashi
Administrator

c: Daniel Dinell, HCDA

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

James S. Kometani
Chairperson

Daniel Dinell
Executive Director

677 Ala Moana Boulevard
Suite 1001
Honolulu, Hawaii
96813

Telephone
(808) 587-2870

Facsimile
(808) 587-8150

E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No: PL MAP 5.7.19.1

May 12, 2005

Ms. Laura Thielen, Administrator
Office of Planning
State of Hawaii
235 South Beretania Street, 6th Floor
Honolulu, Hawaii 96813

Dear Ms. Thielen:

Re: Pre-Assessment Consultation
Kakaako Community Development District
Makai Area Plan and Rules Amendment

Thank you for your letter of February 4, 2005 supporting and providing comments on the proposed amendments to the Makai Area Plan and Rules. The Hawaii Community Development Authority ("HCDA") recognizes the need to provide a multi-modal transportation system in the Makai Area. The Draft Environmental Assessment will discuss the Makai Area transportation system, including the bikeway and transit systems. With regard to off-street parking, residential developments in the Makai Area will be required to provide off-street parking to reduce competition for on-street parking with workers and consumers.

We recognize that public safety is a key factor in a mixed-use district. The HCDA's vision for the Makai Area is to develop it as a gathering place that is the centerpiece for a mixed-use community. It is anticipated that pedestrian-friendly sidewalks and street frontages combined with a mix of retail, restaurant and commercial uses will create an active environment that will promote public safety.

Residential developments in the Makai Area will be required to provide affordable housing similar to residential developments in the Mauka Area. The requirement for residential developments in the Mauka Area calls for the provision of twenty percent of the total number of dwellings units for sale or rental to qualified persons, as determined by the HCDA.

We appreciate your participation in the environmental review process.

Sincerely,

fr Daniel Dinell
Executive Director

DD/ST:ll

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU
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
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
FEB 03 2005
WILSON OKAMOTO CORPORATION

February 1, 2005
HCDAKAKAAKO.RCM

LD-NAV

Rodney Funakoshi, AICP
Project Manager
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Funakoshi:

SUBJECT: Pre-Assessment Consultation for Proposed Community Development District Makai Area Plan and Rules Amendment

Thank you for the opportunity to review and comment on the subject matter

A copy of your letter dated December 20, 2004 (project summary) and maps pertaining to the subject matter was transmitted or made available to the following Department of Land and Natural Resources' Divisions for their review and comment:

- Division of Forestry and Wildlife
- Division of State Parks
- Engineering Division
- Commission on Water Resource Management
- Office of Conservation and Coastal Lands
- Land-Oahu District Land Office
- Land- Planning and Development

Enclosed please find a copy of the Engineering Division and Division of State Parks comments.

Based on the attached responses, the Department of Land and Natural Resources has no other comment to offer on the subject matter.

If you have any questions, please contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 587-0384.

Very truly yours,

WARREN WEGESEND
Administrator

C: ODLO

LINDA LINGLE
GOVERNOR OF HAWAII

2005 JAN 20 A 10:30

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
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
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 13, 2005

LD/NAV
HCDAKAKAAKO.CMT

Suspense Date: 1/20/05

MEMORANDUM:

TO:
- XXX Engineering Division
- XXX Division of State Parks
- ✓ XXX Division of Forestry and Wildlife
- XXX Commission on Water Resource Management
- XXX Office of Conservation and Coastal Lands
- XXX Land-Oahu District Land Office
- XXX Land-Planning and Development

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for Proposed Kakaako Community Development District Makai Area Plan and Rules Amendment
Applicant: The Hawaii Community Development Authority
Consultant: Wilson Okamoto Corporation

Please review the attached letter and maps (summary) pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at 587-0384.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

(X) We have no comments. ( ) Comments attached.

Signed: Paul J Conry Date: JAN 18 2004

Name: PAUL J. CONRY, ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE Division: ______

LINDA LINGLE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION

2005 JAN 21 A 10:25

DEPT OF LAND & NATURAL RESOURCES STATE OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
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
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 13, 2005

'05 JAN 14 PM 01:14 ENGINEERING

LD/NAV
HCDAKAKAAKO.CMT

Suspense Date: 1/20/05

MEMORANDUM:

TO: √ XXX Engineering Division
XXX Division of State Parks
XXX Division of Forestry and Wildlife
XXX Commission on Water Resource Management
XXX Office of Conservation and Coastal Lands
XXX Land-Oahu District Land Office
XXX Land-Planning and Development

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for Proposed Kakaako Community Development District Makai Area Plan and Rules Amendment
Applicant: The Hawaii Community Development Authority
Consultant: Wilson Okamoto Corporation

Please review the attached letter and maps (summary) pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at 587-0384.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

( ) We have no comments. (X) Comments attached.

Signed: ______________ Date: 1/20/05

Name: ERIC T. HIRANO, CHIEF ENGINEER Division: Engineering

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LA/NAV

Ref.: HCDAKAKAAKO.CMT
Oahu.478

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) Please take note that the project site according to the Flood Insurance Rate Map (FIRM), is located in Zones X and A. National Flood Insurance Program (NFIP) does not regulate development within Zone X; however, it does regulate development within Zone A as indicated in bold letters below.

( ) 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 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. Robert Sumimoto at (808) 523-4254 or Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.**
- ( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
- ( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
- ( ) Mr. Mario Antonio at (808) 241-6620 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 any 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. Andrew Monden of the Planning Branch at 587-0229.

Signed: Eric T. Hirano
ERIC T. HIRANO, CHIEF ENGINEER

Date: 11/20/05

LINDA LINGLE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION
2005 JAN 24 A 10:50

DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
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

January 13, 2005

LD/NAV
HCDAKAKAAKO.CMT

Suspense Date: 1/20/05

MEMORANDUM:

TO:
XXX Engineering Division
XXX Division of State Parks
XXX Division of Forestry and Wildlife
XXX Commission on Water Resource Management
XXX Office of Conservation and Coastal Lands
✓XXX Land-Oahu District Land Office
XXX Land-Planning and Development

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for Proposed Kakaako Community Development District Makai Area Plan and Rules Amendment
Applicant: The Hawaii Community Development Authority
Consultant: Wilson Okamoto Corporation

Please review the attached letter and maps (summary) pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at 587-0384.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

(✓) We have no comments.   ( ) Comments attached.

Signed: Cecil Santos   Date: 1/14/05

Name: CECIL SANTOS   Division: LAND

LINDA LINGLE
GOVERNOR OF HAWAII

RECEIVED

05 JAN 14 A11:25

RECEIVED
LAND DIVISION

2005 JAN 20 P 3:23

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
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LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 13, 2005

LD/NAV
HCDAKAKAAKO.CMT

Suspense Date: 1/20/05

MEMORANDUM:

~~TO~~: FR:
XXX Engineering Division
XXX Division of State Parks
XXX Division of Forestry and Wildlife
✓XXX Commission on Water Resource Management
XXX Office of Conservation and Coastal Lands
XXX Land-Oahu District Land Office
XXX Land-Planning and Development

~~FROM~~: TO:
Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for Proposed Kakaako Community Development District Makai Area Plan and Rules Amendment
Applicant: The Hawaii Community Development Authority
Consultant: Wilson Okamoto Corporation

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Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at 587-0384.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

(✓) We have no comments. ( ) Comments attached.

Signed: Edwin T. Sakoda Date: 1/19/05

Name: Edwin T. Sakoda Division: CWRM

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

January 13, 2005

LD/NAV
HCDAKAKAAKO.CMT

Suspense Date: 1/20/05

MEMORANDUM:

TO: XXX Engineering Division
XXX Division of State Parks
XXX Division of Forestry and Wildlife
XXX Commission on Water Resource Management
XXX Office of Conservation and Coastal Lands
✓XXX Land-Oahu District Land Office
XXX Land-Planning and Development

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for Proposed Kakaako Community Development District Makai Area Plan and Rules Amendment
Applicant: The Hawaii Community Development Authority
Consultant: Wilson Okamoto Corporation

Please review the attached letter and maps (summary) pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at 587-0384.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

(✓) We have no comments. ( ) Comments attached.

Signed: Cecil Santos Date: 1/14/05

Name: CECIL SANTOS Division: LAND

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF STATE PARKS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
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KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

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DIVISION
2005 JAN 31 P 3:43

DIVISION OF AQU...
DIRECTOR
COM FISHERIES
AQ REC/ENV
AQ RES
STAFF SVCS
Suspense
Draft Reply
Reply Direct
Comments
Information

January 25, 2005

MEMORANDUM

To: Dierdre S. Mamiya, Administrator
Land Division

From: Daniel S. Quinn, Administrator
Division of State Parks

Subject: Pre-Assessment Consultation for Proposed Kaka'ako Community Development District Makai Area Plan and Rules Amendmentfor the Hawai'i Community Developmemt Authority

The makai area includes Kaka'ako Waterfront Park, therefore, we wish to be a consulted party in the development of the draft environmental assessment for the proposed project. If you have questions, please contact Lauren Tanaka at 587-0293 or by email.

RECEIVED
JAN 27 2005
AQUATIC RESOURCES

RECEIVED
STATE PARKS DIV

'05 JAN 18 A10:21

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
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KAHOOLAWE ISLAND RESERVE COMMISSION
STATE PARKS

DEPT OF LAND & NATURAL RESOURCES

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 13, 2005

ADMINISTRATOR
ASST ADMIN
DEV BR
PLAN BR L7
RES MGT BR
CLERICAL
ADMIN ASST
INTERP BR

FOR:
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HCDAKAKAAKO.CMT

Suspense Date: 1/20/05

MEMORANDUM:

TO: XXX Engineering Division
XXX Division of State Parks
XXX Division of Forestry and Wildlife
XXX Commission on Water Resource Management
XXX Office of Conservation and Coastal Lands
XXX Land-Oahu District Land Office
XXX Land-Planning and Development

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for Proposed Kakaako Community Development District Makai Area Plan and Rules Amendment
Applicant: The Hawaii Community Development Authority
Consultant: Wilson Okamoto Corporation

Please review the attached letter and maps (summary) pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you need more time to review the subject matter, please contact Nicholas A. Vaccaro at 587-0384.

If this office does not receive your comments by the suspense date, we will assume there are no comments.

( ) We have no comments. (X) Comments attached.

Signed: ______________ Date: Jan. 25, 2005

Name: Daniel S. Quinn, Administrator Division: State Parks

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

James S. Kometani
Chairperson

Daniel Dinell
Executive Director

677 Ala Moana Boulevard
Suite 1001
Honolulu, Hawaii
96813

Telephone
(808) 587-2870

Facsimile
(808) 587-8150

E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL MAP 5.7.19.1

May 12, 2005

Mr. Harry Yada, Acting Administrator
Land Division
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Yada:

Re: Pre-Assessment Consultation
Kakaako Community Development District
Makai Area Plan and Rules Amendment

Thank you for your letter of February 1, 2005 forwarding comments from respective Divisions of the Department of Land and Natural Resources. We acknowledge the Engineering Division's comment that the project site is located in flood hazard zone "X" and "A". Developments in Zone A will be required with the rules and regulations of the National Flood Insurance Program and the City and County of Honolulu's Land Use Ordinance as it pertains to flood regulations.

The Draft Environmental Assessment ("Draft EA") will state that State-sponsored projects requiring water service from the Honolulu Board of Water Supply first must obtain a water allocation credit from the Engineering Division. The Draft EA will also include anticipated water demands for inclusion in the State Water Projects Plan Update.

We acknowledge the Division of State Park's request to be a consulted party and will transmit a copy of the Draft EA to the Division for their review and comment.

We appreciate your participation in the environmental review process.

Sincerely,

Danny K. Dinell
for Daniel Dinell
Executive Director

DD/ST:ll

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BRUCE Y. MATSUI
BARRY FUKUNAGA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

STP 8.1537

January 7, 2005

RECEIVED
JAN 28 2005
WILSON OKAMOTO CORPORATION

Mr. Rodney Funakoshi, AICP
Project Manager
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Funakoshi:

Subject: Pre-Assessment Consultation
Kakaako Community Development District
Makai Area Plan and Rules Amendment

Thank you for your consultation letter of December 20, 2004.

The proposed amendments for the Makai Area of the Kakaako Community Development District may generate traffic impacts in the area along Ala Moana Boulevard. We understand that your firm will prepare a traffic impact assessment and we request that at least four (4) copies of the assessment report be provided to our Department for our review and comment.

We appreciate the courtesy of your advance notice and for the opportunity to provide our comments.

Very truly yours,

Rodney Haraga

RODNEY K. HARAGA
Director of Transportation

c: Susan Tamura, Hawaii Community Development Authority

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

James S. Kometani
Chairperson

Daniel Dinell
Executive Director

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Facsimile
(808) 587-8150

E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL MAP 5.7.19.1

May 12, 2005

Mr. Rodney K. Haraga, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Haraga:

Re: Pre-Assessment Consultation
Kakaako Community Development District
Makai Area Plan and Rules Amendment

Thank you for your letter of January 7, 2005 providing comments on the proposed amendments to the Makai Area Plan and Rules. As requested, we will forward four copies of the project's traffic impact assessment report to your Department for review and comment.

We appreciate your participation in the environmental review process.

Sincerely,

for Daniel Dinell
Executive Director

DD/ST:ll

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

January 18, 2005

RECEIVED
JAN 20 2005
WILSON OKAMOTO CORPORATION

Mr. Rodney Funakoshi, AICP
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Funakoshi:

Subject: Your letter of December 20, 2004 on the Environmental Assessment Pre-Assessment Consultation, Kakaako Community Development District Makai Area Plan and Rules Amendment, Kakaako, Oahu, Hawaii.

Thank you for the opportunity to comment on the proposed amendments to the Kakaako Community Development District Makai Area Plan and Rules.

We have no objections to the proposed amendments.

The developer will be required to obtain a water allocation from the State Department of Land and Natural Resources.

If you have any questions, please contact Joseph Kaakua at 748-5443.

Very truly yours,

K. Shida

Keith S. Shida
Principal Executive
Customer Care Division

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

James S. Kometani
Chairperson

Daniel Dinell
Executive Director

677 Ala Moana Boulevard
Suite 1001
Honolulu, Hawaii
96813

Telephone
(808) 587-2870

Facsimile
(808) 587-8150

E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL MAP 5.7.19.1

May 12, 2005

Mr. Keith S. Shida
Principal Executive
Customer Care Division
Honolulu Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Shida:

Re: Pre-Assessment Consultation
Kakaako Community Development District
Makai Area Plan and Rules Amendment

Thank you for your letter of January 18, 2005 stating that you have no objections to the proposed amendments. We acknowledge that developers will be required to obtain a water allocation from the State Department of Land and Natural Resources.

We appreciate your participation in the environmental review process.

Sincerely,

for Daniel Dinell
Executive Director

DD/ST:ll

Post-it® Fax Note 7671	Date 1/25	# of pages ▸ 2
To Rodney Funakoshi	From Dina Wong	
Co./Dept.	Co. DPP	
Phone #	Phone # 527-6073	
Fax # 946-2253	Fax #	

DEPARTMENT OF PLANNIN[G AND PERMITTING]
CITY AND COUNTY [OF HONOLULU]
650 SOUTH KING STREET, 7TH FLOOR
PHONE: (808) 523-4432 •
DEPT. WEB SITE: www.honoluludpp.org •

MUFI HANNEMANN
MAYOR

HENRY ENG, FAICP
ACTING DIRECTOR

DAVID K. TANOUE
DEPUTY DIRECTOR

2004/ELOG-2873 (DW)

January 25, 2005

Mr. Rodney Funakoshi, AICP
Project Manager
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Funakoshi:

Environmental Assessment Pre-Consultation for
Kakaako Community Development District
Makai Area Plan and Rules Amendment

Thank you for the opportunity to review the summary information and supporting exhibits describing the proposed amendments to the Kakaako Community Development District Makai Area Plan and Rules. The amendments are proposed by the Hawaii Community Development Authority (HCDA) and will allow residential use in the Makai Area. The proposed amendments are intended to encourage the development of an active "urban village" in the Kakaako Makai Area.

Redevelopment of Kakaako is key to the full build-out of the Primary Urban Center (PUC). The area is projected to absorb about 30 percent of the PUC's future residential growth and a large portion of the region's projected commercial growth. We are pleased that the stated intent of the amendments is to create a more active waterfront or "urban village," more mixed-use development, and will increase opportunities for more residential development in Kakaako. Our more specific comments with respect to the Primary Urban Center Development Plan (PUC DP) follow.

1. Changes to permitted uses by precincts cannot fulfill the intent by themselves. In order to do so, any proposed amendments should include sufficient direction in creating livable neighborhoods with defined neighborhood centers. The Plan and Rules should promote people-scaled apartment and townhouse dwellings oriented to the street, and the provision of high-density housing options in mixed-use developments around transit stations. (See PUC DP Section 3.2.2.1 Neighborhood Planning, Section 3.2.2.4 Shopping and Retail Business Districts, and Section 3.3.2 Policies).

Mr. Rodney Funakoshi, AICP
Project Manager
Wilson Okamoto Corporation
Page 2

2. The proposed adjustment to maximum building height from 45 feet to 65 feet adjacent to Kewalo Basin needs to be justified in more detail. We are concerned about increasing building masses close to the water.

3. This amendment process should also consider revisiting other height limits. Height limits should preserve panoramic views of natural features and landmarks, panoramic views of the urban skyline, and mauka-makai street corridors (see PUC DP Section 3.1.1.2 Scenic Views, Figure 3.1 View Corridors, Section 3.1.2 Policies, Section 3.1.3 Guidelines, and Map A.1 Significant Panoramic Views).

   As described in the PUC DP, there are public places along the shoreline, such as the Kakaako Waterfront Park and Kewalo Basin, where panoramic mauka views of the Koolau Mountain Range and Punchbowl are gradually diminishing as high-rise buildings are developed to the height limit allowed. We look forward to a photographic analysis on the visual impacts of the current height limits.

4. The PUC DP notes that existing provisions in the Makai Area Rules favor tower-type apartment buildings with large parking pedestals covering most of the lot. This kind of development relates poorly to the street, public ground level open spaces, and other buildings around them. Consideration should be given to expanding Rule changes to favor, if not mandate, development that contributes to a cohesive neighborhood environment with alternative types of housing design which have pedestrian entrances, ground-floor shops, and parking accessed from side or rear driveways rather than the front yards.

5. The summary of the proposed amendments that was provided indicates on page 1 under the paragraph titled Proposed Action that the current Makai Area Plan was adopted in 1998. Please note that the current Makai Area Plan and Rules is dated November 2002.

We look forward to the draft assessment. Please call Dina Wong of my Community Action Plans Branch staff at 527-6073 if you have any questions.

Sincerely yours,

HENRY ENG, FAICP
Acting Director of Planning and Permitting

HE:lh
Doc: 346610

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

James S. Kometani
Chairperson

Daniel Dinell
Executive Director

?77 Ala Moana Boulevard
Suite 1001
Honolulu, Hawaii
96813

Telephone
(808) 587-2870

Facsimile
(808) 587-8150

E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL MAP 5.7.19.1

May 12, 2005

Mr. Henry Eng, FAICP, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. Eng:

Re: Pre-Assessment Consultation
Kakaako Community Development District
Makai Area Plan and Rules Amendment

Thank you for your letter of January 25, 2005 commenting on the subject project. We offer the following responses in the respective order of your comments.

1. The Hawaii Community Development Authority ("HCDA") recognizes that changing permitted uses will not by itself fulfill the goal of creating a "livable", mixed-use community in the Makai Area. Development of the state-owned lands in the Makai Area is being pursued by issuing Request for Proposals ("RFP") for large tracts of land as they become unencumbered and infrastructure is installed. As you are probably aware, the HCDA recently issued an RFP to develop about 36½ acres of land in the Makai Area. The development of this area by a master developer will help to ensure the creation of a cohesive, mixed-use community. Among other factors, proposals are being evaluated on their environmental and economic sustainability and the extent to which they advance the HCDA's goal of creating a walkable, vibrant and attractive mixed-use gathering place in the Makai Area.

2. Increasing the height limit in the Waterfront Commercial zone at the west end of Kewalo Basin would further the goal of creating mixed-use development. It is envisioned that a development in this area could include residences constructed above retail establishments and restaurants. Increasing the height limit provides greater flexibility to improve this area. This amendment is also necessary because the high water table in the area precludes below-grade development.

Mr. Henry Eng
Page Two
May 12, 2005

3. The existing Makai Area Plan contains policies and guidelines to preserve major view planes, view corridors, and shoreline and ocean views. The Makai Area Plan preserves views that are 360° from the lookout in Kakaako Waterfront Park, mauka view corridors through Keawe, Coral, Cooke, and Ohe Streets, and makai views from Kewalo Basin. In addition, we note that the 1998 Makai Area Plan reduced height limits along Ala Moana Boulevard from 300 feet to 200 feet.

4. As noted previously, the HCDA's goal is to create a walkable, vibrant, and attractive mixed-use gathering place in the Makai Area. Through HCDA's Development Permit and Design Review process, developments are being evaluated on how they advance this goal and contribute towards the creation of a cohesive neighborhood. The concept of parking liners with ground floor commercial/retail establishments fronting the roadway, commercial offices or multi-family apartments above, and parking structures behind these uses, has been proposed and is advocated in HCDA's Waterfront Business Plan.

5. For clarification, the last major revision of the Makai Area Plan and Rules was adopted by the HCDA in 1998, however, amendments to the 1998 Plan and Rules were made in 2002. The proposed action is correctly referenced as an amendment to the 1998 Makai Area Plan and Rules since this is the last comprehensive revision adopted by the HCDA.

We appreciate your participation in the environmental review process.

Sincerely,

for Daniel Dinell
Executive Director

DD/ST:ll

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730 • INTERNET: www.co.honolulu.hi.us

RECEIVED
JAN 26 2005
WILSON OKAMOTO CORPORATION

MUFI HANNEMANN
MAYOR

EDWARD Y. HIRATA
ACTING DIRECTOR

TP12/04-87963R

January 20, 2005

Mr. Rodney Funakoshi, AICP
Project Manager
Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826

Dear Mr. Funakoshi:

Subject: Residential Use in the Kakaako Makai Area

In response to your December 20, 2004 letter, we have reviewed the information provided regarding the proposed rules amendment to allow residential use in the Kakaako Makai Area. According to this information, a traffic impact assessment is in progress and its findings will be discussed in the environmental assessment (EA) that is being prepared for the area. In addition, a related transit impact assessment that evaluates the changes to public transit service that are anticipated due to the proposed rules amendment should be conducted.

We look forward to reviewing the EA. In order to facilitate its review, please provide us with two copies of the document.

Should you have any questions regarding this matter, please contact Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

EDWARD Y. HIRATA
Acting Director

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

James S. Kometani
Chairperson

Daniel Dinell
Executive Director

677 Ala Moana Boulevard
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E-Mail
contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL MAP 5.7.19.1

May 12, 2005

Mr. Edward Y. Hirata, Acting Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Dear Mr. Hirata:

Re: Pre-Assessment Consultation
Kakaako Community Development District
Makai Area Plan and Rules Amendment

Thank you for your letter of January 20, 2005 commenting on the subject project. We acknowledge your request that a transit impact assessment be prepared, however, the baseline information is presently unavailable to prepare such an assessment. Furthermore, the assessment would be dependent on the broader regional transit system and the City's long-range transit plans, which are undergoing revisions. The Draft Environmental Assessment ("Draft EA") will include a discussion of the improved bus transit service to the Kakaako Makai Area.

As requested, we will transmit two copies of the Draft EA to your Department for review and comment.

We appreciate your participation in the environmental review process.

Sincerely,

for Daniel Dinell
Executive Director

DD/ST:ll

Kakaako IMPROVEMENT ASSOCIATION

P.O. Box 3776 Honolulu, Hawai'I 96812
Phone: 591-0000

Wilson Okamoto Corporation
1907 South Beretania, Suite 400
Honolulu, Hawaii 96826
Attn: Rodney Funakoshi

RE: Environmental Assessment Kakaako Makai

Dear Mr. Funakoshi,
Thank you for allowing us to submit comment and considering our views. We have reviewed your 'Kakaako Makai Area Plan Amendment Environmental Assessment' and have the following to offer.:

It appears that the main thrust of the amendment is to allow residential in the makai area. Kakaakao Improvement Association opposes residential in the makai area on State Land.

We have heard the presentations regarding the urban village concept and understand that there is a study that says a critical mass of residents in the makai area will keep the area safe and more active. There are several examples where this is not necessarily true.

The makai area is predominantly government land that should be used for public good. I think there is little disagreement that the amount of land in the makai area is limited. There are obviously a number of good government uses for the makai lands that would sensibly be in the makai area. The District Cooling proposal, for example, which uses differential temperatures in seawater to create a chilled water loop for Honolulu district cooling. That's a use that obviously needs to be close to seawater that is an integral part of the system.

Allowing residential on State property in the makai area would reduce the amount of land available for public uses. It would also tend to restrict the use by the public of the makai lands thereby making it 'exclusive'.

I would hate to see government lands in the makai area 'sold' or 'leased' for private residences thereby taking it out of the government use and then running out of lands for government function and condemning private lands to satisfy a need. In the mauka area, although it is currently being avoided, condemnation to solve a need (parking for example) has been discussed.

We feel that allowing residential in the makai area would drastically change the dynamics of the use of the makai lands and would definitely impact the environment and the public. We feel that an Environmental Impact Statement addressing the dynamics and effects of this proposal is needed.

Again, thank you for considering our views. We look forward to your Environmental Impact Statement and to providing input. Should you have any questions I may be reached at 591-8116.

Me Ke Aloha Pumehana

Kendall Hee, 2005 KIA President

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

James S. Kometani
Chairperson

Daniel Dinell
Executive Director

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contact@hcdaweb.org

Web site
www.hcdaweb.org

Ref. No.: PL MAP 5.7.19.1

May 12, 2005

Mr. Kendall Hee, President
Kakaako Improvement Association
P.O. Box 3776
Honolulu, Hawaii 96812

Dear Mr. Hee:

Re: Pre-Assessment Consultation
Kakaako Community Development District
Makai Area Plan and Rules Amendment

Thank you for your letter providing comments on the proposed amendment to the Makai Area Plan and Rules. We acknowledge your concerns with the proposed amendments and offer the following for your consideration.

The addition of residential use will not reduce the amount of land available for the public benefit. In fact, the residential sales are intended to support the development of public facilities through the public facilities dedication and common area maintenance fees. The lands to be designated for "Mixed-Use" are presently designated for "Commercial" use. No lands designated as "Park" or "Public Use" or lands used by the State Department of Transportation for maritime uses will be affected by the amendments.

Allowing residential use will not result in restrictions on access to the Makai Area nor make these lands exclusive. Much of the waterfront in the Makai Area, including the Kakaako Waterfront Park and Kewalo Basin Park, provide unrestricted access to the public. The redevelopment of the Kewalo Basin area with waterfront commercial and residential uses will open and make more of the waterfront accessible to the public. The Hawaii Community Development Authority's objective is one of creating a "gathering place" for residents and visitors.

With regard to changes in use, one goal of the Makai Area Plan is to bring about a dynamic change and revitalize the Makai Area. The Makai Area has historically been underutilized and developed primarily with industrial uses. Redevelopment of the Makai Area as a mixed-use community with office, commercial, retail, residential, recreational and public uses provides the greatest benefit to the public as a whole.

Mr. Kendall Hee
Page Two
May 12, 2005

We believe that the proposed amendments will not generate significant environmental or social impacts warranting the preparation of an environmental impact statement. An in-depth traffic impact assessment has been prepared and will be included in the forthcoming Draft Environmental Assessment. In addition, residential use in the Makai Area was assessed in a Final Supplemental Environmental Impact Statement ("SEIS") for the Makai Area Plan. The SEIS was accepted by the Governor in October 1994.

We appreciate your participation in the environmental review process.

Sincerely,

for Daniel Dinell
Executive Director

DD/ST:ll

Draft Environmental Assessment Comments

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 223
FORT SHAFTER, HAWAII 96858-5440

RECEIVED 8902

2005 MAY 31 AM 10 36

HAWAII COMMUNITY
DEVELOPMENT
AUTHORITY

REPLY TO
ATTENTION OF: CEPOH-EC-T

May 27, 2005

Civil Works Technical Branch

Ms. Susan Tamura
Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, Hawaii 96813

Dear Ms. Tamura:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the Kakaako Makai Area Plan Amendment Project, Kakaako, Oahu (TMKs 2-1-15; 2-1-58, 59, 60). The following comments are provided in accordance with Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

a. Based on a review of the information submitted in the EA, a DA permit will not be required.

b. The flood hazard information provided on page 12 of the DEA is correct.

Should you have any questions, please call Ms. Jessie Dobinchick of my staff at 438-8876.

Sincerely,

James Pennaz

James Pennaz, P.E.
Chief, Civil Works
Technical Branch

HAWAII COMMUNITY
DEVELOPMENT AUTHORITY

KAKAAKO
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www.hcdaweb.org

Ref. No.: PL EIS 6.24.3

July 13, 2005

Ms. June F. Harrigan-Lum, Manager
Environmental Planning Office
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801-3378

Dear Ms. Harrigan-Lum:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of June 20, 2005 indicated that you have no comments to offer on the subject Draft Environmental Assessment.

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell
Executive Director

DD/TT/ST:ll

8935

RECEIVED

2005 JUN 8 PM 3 28

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR
LAURA H. THIELEN
DIRECTOR
OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-10957

June 6, 2005

To: Daniel Dinell, Executive Director
Hawaii Community Development Authority

Attention: Ms. Susan Tamura

From: Laura H. Thielen, Director

Subject: Draft Environmental Assessment
Kakaako Makai Area Plan Amendment
Kakaako, Oahu

Thank you for the opportunity to comment on the Draft Environmental Assessment (EA) for proposed amendments to the Kakaako Makai Area Plan, and to participate in the environmental review process.

We have reviewed the Draft EA and have no comments at this time.

If you have any questions, please contact Rachael Edinger of our Coastal Zone Management Program at 587-2831.

c: Mr. Rodney Funakoshi, Wilson Okamoto Corporation
Ms. Genevieve Salmonson, OEQC

HAWAII COMMUNITY
DEVELOPMENT AUTHORITY

KAKAAKO
KALAELOA

Linda Lingle
Governor

James S. Kometani
Chairperson

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Ref. No.: PL EIS 6.24.3

July 13, 2005

Ms. Laura H. Thielen, Director
Office of Planning
State of Hawaii
235 South Beretania Street, 6th Floor
Honolulu, Hawaii 96813

Dear Ms. Thielen:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of June 6, 2005 indicated that you have no comments to offer on the subject Draft Environmental Assessment.

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell

Daniel Dinell
Executive Director

DD/TT/ST:ll

8984

RECEIVED

2005 JUN 22 AM 9 57

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
EPO-05-042

June 20, 2005

Ms. Susan Tamura
Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, Hawaii 96813

Dear Ms. Tamura:

SUBJECT: Draft Environmental Assessment
Kakaako Makai Area Plan Amendment
Kakaako Community Development District
Kakaako Makai Area, Honolulu, Hawaii
TMK: 2-1-15, 2-1-58, 2—59, 2-1-60 (all parcels)

Thank you for allowing us to review and comment on the subject document. We have no comment at this time and please refer to our website for the Standard Comments (http://www.state.hi.us/health/environmental/env-planning/landuse/landuse.html). If there are any questions about these standard comments please contact Jiacai Liu with the Environmental Planning Office at 586-4346.

Sincerely,

June F. Harrigan-Lum

JUNE F. HARRIGAN-LUM, MANAGER
Environmental Planning Office

c: EPO
WWB
HEER
CWB
SHWB

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

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Ref. No.: PL EIS 6.24.3

July 13, 2005

Mr. James Pennaz, P. E., Chief
Civil Works Technical Branch
U. S. Army Engineer District, Honolulu
Building 223
Fort Shafter, Hawaii 96858-5440

Dear Mr. Pennaz:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of May 27, 2005 commenting that a DA permit will not be required and that the flood information provided in the Draft Environmental Assessment is correct.

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell
Executive Director

DD/TT/ST:ll

DM

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186
E-mail: oeqc@health.state.hi.us

May 23, 2005

Daniel Dinell, Acting Director
Hawaii Community Development Authority
677 Ala Moana Blvd., #1001
Honolulu, Hawaii 96813

Attn: Susan Tamura

Dear Mr. Dinell:

Subject: Draft Environmental Assessment (EA)
Kakaako Community Development Makai Area Plan

We have the following comments to offer:

Two-sided pages: In order to reduce bulk and save on paper, please print on both sides of the pages in the final document.

Archeological resources: In section 3.2.5, *Historic and Archaeological Resources,* there is no mention of archeological resources. If this issue was covered in a previous EIS, then synopsize issues and impacts presented in that document and reproduce earlier correspondence from the State Historic Preservation Division of DLNR giving its "no effect" determination.

Sustainable building techniques: Please consider applying sustainable building techniques presented in the "Guidelines for Sustainable Building Design in Hawaii." The EA mentions use of non-potable water for irrigation, placement of bins for recyclables, energy-efficient equipment and design, and appropriate landscaping. In the final EA include a description of any other techniques you will implement. Contact our office for a paper copy of the guidelines or go to our website at *http://www.state.hi.us/health/oeqc/guidance/sustainable.htm.*

Cultural impacts assessment:

Act 50 was passed by the legislature in April 2000. This mandates an assessment of impacts to current cultural practices by the proposed project. In the final EA include such an assessment.

If the subject area is in a developed urban setting, cultural impacts must still be assessed. Many incorrectly assume that the presence of urban infrastructure effectively precludes consideration of current cultural factors. For example, persons are known to gather kauna'oa, 'ilima, 'uhaloa, noni or ki on the grassy slopes and ramps of the H-1 freeway and some state highways on the neighbor islands. Certain landmarks and physical features are used by Hawaiian navigators for sailing, and the lines of sight from landmarks to the coast by fisherman to locate certain fishing spots. Blocking these features by the construction of buildings or tanks may constitute an adverse cultural impact.

For assistance in the preparation refer to our *Guidelines for Assessing Cultural Impacts.* Contact our office for a paper copy or go to our homepage at *http://www.state.hi.us/health.oeqc/guidance/index.html.* You will also find the text of Act 50 linked to this section of our homepage.

Visual impacts: In the final EA include renderings of the proposed buildings and any proposed landscaping that show the final appearance of the residential areas.

Funding: In the final EA disclose percentages of federal, state and private funding for this project.

Alternatives: Besides the no action alternative, have any others been considered? In the final EA briefly describe the others and give the reasons they were rejected.

Construction phase:

a. Prior to commencement of construction activities we recommend that you notify the makai area occupants of the upcoming disturbance. This is especially true if pile driving is involved.
b. What are the anticipated start and end dates of the construction phase?

Terminology: The Project Summary section lists "Accepting Authority: Governor, State of Hawaii." The term *accepting authority* is only used for EISs. For EAs the proper term is either *approving agency* or *permitting agency*. This refers to the agency which grants the major approval or permit.

If you have any questions, call Nancy Heinrich at 586-4185.

Sincerely,

Genevieve Salmonson

GENEVIEVE SALMONSON
Director

c: Rodney Funakoshi

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

James S. Kometani
Chairperson

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Ref. No.: PL EIS 6.24.3

July 13, 2005

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of May 23, 2005 providing comments on the Draft Environmental Assessment (Draft EA) for the subject project. We offer the following responses in the respective order of your comments.

1. The Final EA will be printed double-sided.

2. The State Historic Preservation Division (SHPD) was a consulted party for the Draft Environmental Assessment; however, we have not received comments from them. During preparation of the 1998 Makai Area Plan Supplemental EIS the SHPD commented that "because the area makai of Ala Moana Boulevard is comprised of fill lands we believe that the development of the area will have "no effect" on subsurface cultural deposits because it is unlikely that any are present." As requested, the letter will be attached to the Final EA.

3. The proposed action involves an amendment to the Makai Area Plan and Rules rather than a specific development proposal. As such, details regarding future developments are not known. The HCDA, however, encourages developers to incorporate sustainable building techniques into their developments.

4. The Final EA will include a discussion of potential cultural impacts.

5. A visual simulation showing the potential impact of increasing the height limit in the Waterfront Commercial zone near Kewalo Basin was provided in the Draft EA. As stated previously, the proposed action involves an amendment to the Makai Area Plan and Rules, which stipulate general zoning requirements. While renderings of proposed buildings and landscaping cannot be provide at this time, the Makai Area Rules do require projects to provide landscaping within the front and side yard areas. Large shade trees are also required along all street frontages.

6. As requested, the funding for the proposed action will be included in the Final EA.

7. No alternatives besides the no action alternative were considered.

8. Existing occupants of the Makai Area that may be affected by construction activity will be notified prior to commencing construction. The Makai Area Plan is intended to provide guidance for the long-range development of the Makai Area. Certain developments such as the redevelopment of the Kewalo Basin Area and the Cancer Research Center of Hawaii next to the John A. Burns School of Medicine are expected to commence in the next three years. Other developments will be pursued by the HCDA through the Request for Proposals process.

9. As requested, the Final EA will state that the HCDA is the approving agency for the EA.

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell
Executive Director

DD/TT/ST:ll

RYF

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BRUCE Y. MATSUI
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

STP 8.1802

June 23, 2005

RECEIVED
JUN 27 2005
WILSON OKAMOTO CORPORATION

TO: MR. DANIEL DINELL, EXECUTIVE DIRECTOR
HAWAII COMMUNITY DEVELOPMENT AUTHORITY
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM

ATTN: SUSAN TAMURA

FROM: RODNEY K. HARAGA
DIRECTOR OF TRANSPORTATION

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
MAKAI AREA PLAN AMENDMENT, HAWAII COMMUNITY DEVELOPMENT DISTRICT

Thank you for providing a copy of the subject Draft Environmental Assessment (Draft EA) and copies of the traffic assessment (titled as the "Transportation Plan") on the Makai Area project for our review. We have the following initial comments:

1. The Draft EA and Transportation Plan recommend significant changes to the State and County roads within the project area which will impact our Harbors and Highways facilities. The recommended changes will need to be further discussed and coordinated with your agency, the City and County of Honolulu and our Department.

2. The Transportation Plan should discuss the traffic impacts from developments or projects in the Development District's Mauka Area and Makai Area through to the Year 2025, including Victoria Ward Estate/General Growth Properties in the Mauka Area.

3. The Transportation Plan should identify interim mitigation measures and roadway/intersection improvements in the event the schedule of anticipated projects and developments in Mauka and/or Makai Areas of the Development District are delayed or modified.

4. The Draft EA shows that the existing Hawaiian Electric Honolulu (Downtown) Power Plant is part of the Makai Area. The Draft EA and Transportation Plan should discuss the potential change to the site, roadways and surrounding lands in the event the electric

plant is moved. (As a side note, the DOT is opposed to the relocation of the HECO plant to Sand Island).

The potential future changes in the Makai Area and recommended roadway and intersection changes outlined in the Draft EA and Transportation Plan are significant. They can have an impact to Honolulu Harbor from Piers 1 to 9 and Nimitz Highway-Ala Moana Boulevard from Bishop Street to Piikoi Street. Because of the extent and number of impacts, we are awaiting additional technical comments from our Harbors and Highways staff which we will forward to you as soon as we receive them.

We appreciate the opportunity to provide our comments.

c: Genevieve Salmonson, Office of Environmental Quality Control
Rodney Funakoshi, Wilson Okamoto Corporation

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

James S. Kometani
Chairperson

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Ref. No.: PL EIS 6.24.3

July 13, 2005

Mr. Rodney K. Haraga, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Haraga:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of June 23, 2005 providing comments on the Draft Environmental Assessment ("Draft EA") for the subject project. We offer the following responses in the respective order of your comments.

1. We acknowledge that the proposed transportation improvements will require close coordination between the HCDA, Department of Transportation and the City and County of Honolulu. We are planning to meet with your department and City transportation agencies shortly to discuss the recommended traffic improvements.

2. As you may be aware, the State Legislature has recently appropriated funding to prepare traffic studies for various neighborhoods in Honolulu. The HCDA anticipates that a regional traffic study that includes the Kakaako Community Development District's Mauka and Makai Areas will be initiated in the coming year.

3. The development schedule described in the Transportation Plan was the best reasonable estimate for the redevelopment of parcels in the Makai Area. The Transportation Plan is intended to be a planning tool that will guide future transportation improvements in the Makai Area. It is anticipated that the Transportation Plan will need to be reviewed and revised periodically as development in the Makai Area progresses.

4. Although the Hawaiian Electric Honolulu Power Plant may be relocated in the future, we feel it would be premature to include the relocation of the Power Plant in the Transportation Plan since there are no current plans definitive for the power plant's relocation, or for replacement uses.

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell
Executive Director

DD/TT/ST:ll

RYF

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

RECEIVED
JUN 16 2005
WILSON OKAMOTO CORPORATION

HRD05/1881

June 13, 2005

Susan Tamura
Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, HI 96813

RE: Draft Environmental Assessment for the Kaka'ako Makai Area Plan Assessment, Kaka'ako, O'ahu, TMK: 2-1-15, 2-1-58, 2-1-59, 2-1-60 (all parcels).

Dear Susan Tamura,

The Office of Hawaiian Affairs (OHA) is in receipt of your May 16, 2005 request for comment on the above listed proposed project, TMK: 2-1-15, 2-1-58, 2-1-59, 2-1-60 (all parcels). OHA offers the following comments:

OHA is concerned with some of the potential side effects related to the proposed plan amendment for TMK: 2-1-15, 2-1-58, 2-1-59, 2-1-60 (all parcels). With the proposed height limit increases, line of sight for the Kewalo park area will be further reduced. This line of sight has already been nearly eliminated and a 65 foot height envelope would certainly add to the problem.

Affordable rental and housing is of huge concern in the urban areas of Honolulu. What are the projected selling and rental prices of the residential properties proposed in this plan amendment? What will the proposed developments do to address this problem?

Issues such as overcrowding, traffic, lack of affordable public parking and noise are all likely to increase if the proposed developments are undertaken. Are community resources such as public parks and open space areas planned for? Has a cumulative effect assessment been completed in support of this project? If not OHA recommends that such study should be done.

OHA further requests your assurances that if the project goes forward, should iwi or Native Hawaiian cultural or traditional deposits be found during ground disturbance, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

Thank you for the opportunity to comment. If you have further questions or concerns, please contact Jesse Yorck at 594-0239 or jessey@oha.org.

'O wau iho nō,

Clyde W. Nāmu'o
Administrator

CC: Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

✓ Rodney Funakoshi
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 702
Honolulu, HI 96826

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

James S. Kometani
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Ref. No.: PL EIS 6.24.3

July 13, 2005

Mr. Clyde W. Nāmu'o, Administrator
Office of Hawaiian Affairs
State of Hawaii
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

Dear Mr. Nāmu'o:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of June 13, 2005 commenting on the Draft Environmental Assessment (EA). We acknowledge your concerns regarding the height limit increase along the Ewa edge of Kewalo Basin. Increasing the height limit is being proposed to help support the creation of a viable mixed-use waterfront development. As stated in the Draft EA, the high water table in this area precludes below-grade development. This is a considerable constraint because parking garages that could potentially be constructed underground must now be built at or above grade. The long but narrow configuration of the Kewalo parcel is also a severe development constraint. Therefore, the height limit increase will provide greater flexibility for developers to incorporate commercial and residential uses as well as parking facilities. Based on the visual simulation included as Figure 8 of the Draft EA, we do not feel that the height limit increase will significantly impact view corridors.

With regard to housing, we anticipate that about 1,100 residential units may eventually be developed in the Makai Area. According to a residential use and demand assessment prepared for Makai Area, prices for condominiums could start at $350,000. It is the desire of the HCDA, however, to create developments that will be affordable to workers in the Kakaako area. Affordable housing requirements similar to those in place in the Kakaako Mauka Area will be implemented in the Makai Area. The current Mauka Area rules require that multi-family developments on lots 20,000 square feet or larger must provide at least twenty percent of the total number of dwelling units in the development for sale or rental to qualified persons, as determined by the HCDA.

Parks in the Makai Area, including the Kakaako Waterfront Park, Makai Gateway Park, and Kewalo Basin Park, will be unaffected by the proposed amendments. These parks, which total about 40 acres, are more than adequate to support residential development.

Cumulative effects of the proposed amendments were assessed in the Draft EA. Impacts relating to traffic and noise were also assessed in the Draft EA in sections 3.3.1 and 3.7, respectively.

We acknowledge your request that that if iwi or Native Hawaiian cultural or traditional deposits are found during ground disturbance, work is to cease and appropriate agencies are to be contacted. This requirement is included in section 3.2.5 of the Draft EA.

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell
Executive Director

DD/TT/ST:ll

P-1

The Senate
The Twenty-Second Legislature
of the
State of Hawaii

STATE CAPITOL
HONOLULU, HAWAII 96813

June 8, 2005

RECEIVED
JUN 9 2005
WILSON OKAMOTO CORPORATION

Susan Tamura
Hawaii Community Development Authority
677 Ala Moana Blvd., Ste. 1001
Honolulu, HI 96813

Dear Ms. Tamura:

I am writing in opposition to the proposed amendments to the Makai Area Plan and Rules to allow residential use in the Kakaako Makai Area. My reasons for opposing these changes are as follows:

1) The height variance is ill-advised. In a prudent land use scenario, the view plane to the ocean would be preserved for the residents in the current condominiums and future condominiums mauka of Ala Moana.

2) The University of Hawaii in conjunction with the Hawaii State Civil Defense are working on revising the tsunami inundation maps for the southern coast of Oahu. All indications from the latest technology are that the inundation area will extend inland to at least Ala Moana Boulevard. It is foolish and premature for a public agency to seek a variance to build residences prior to the completion of the new maps.

3) The area is an inappropriate location for residential units. The makai area was intended for "public use". Residential use is neither "public" nor is it the highest and best use for the area.

Sincerely,

For,

GORDON TRIMBLE
Senate District 12

CC: Wilson Okamoto Corporation
CC: OEQC

GT: avs

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

James S. Kometani
Chairperson

Daniel Dinell
Executive Director

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Ref. No.: PL EIS 6.24.3

July 13, 2005

The Honorable Gordon Trimble
Senate District 12
Hawaii State Legislature
Hawaii State Capitol Room 203
415 South Beretania Street
Honolulu, Hawaii 96813

Dear Senator Trimble:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of June 8, 2005 providing comments on the Draft Environmental Assessment (Draft EA) for the subject project. We offer the following in response to your comments.

1. The proposal to increase the height limit allowance in the Waterfront Commercial Zone near Kewalo Basin would be an amendment to the Makai Area Plan, rather than a height variance. The height limit increase is being proposed to enable a more viable mixed-use development along the waterfront. We would also note that the most of the parcels immediately makai of Ala Moana Boulevard between South Street and Ward Avenue presently have a height limit of 200 feet. As such, the viewplanes of condominiums mauka of Ala Moana Boulevard are more likely to be obstructed by redevelopment of these parcels than development in the Waterfront Commercial zone.

2. We are aware that the University of Hawaii and Hawaii State Civil Defense are revising the tsunami inundation maps for the southern coast of Oahu. Developments in the Makai Area will be required to comply with applicable flood hazard regulations at the time they are constructed.

3. Public uses are just one of the many uses that were intended for the Makai Area when the Kakaako Community Development District was created. Most of the existing

parcels in the Makai Area are zoned for Commercial uses. As stated in Hawaii Revised Statutes, Chapter 206E-31 "In coordinating community development in the Kakaako district, the authority shall plan a mixed-use district whereby industrial, commercial, residential, and public uses may coexist compatibly within the same area."

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell

Daniel Dinell
Executive Director

DD/TT/ST:ll

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

June 8, 2005

RYF

Ms. Susan Tamura
Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, Hawaii 96813

Dear Ms. Tamura:

Subject: Draft Environmental Assessment for the Kaakaako Makai Area Plan Amendment Dated May 2005, Kakaako, Oahu

Thank you for the opportunity to comment on the subject document.

Our comments of January 18, 2005, which are included in the document, are still applicable.

If you have any questions, please contact Joseph Kaakua at 748-5442.

Very truly yours,

K. Shida

KEITH S. SHIDA
Principal Executive
Customer Care Division

cc: Ms.Genevieve Salmonson (OEQC), Mr. Rodney Funakoshi (Wilson Okamoto Corporation)

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO
KALAELOA

Linda Lingle
Governor

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Ref. No.: PL EIS 6.24.3

July 13, 2005

Mr. Keith S. Shida
Principal Executive
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Shida:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of June 8, 2005 indicated that comments made during the pre-consultation phase of the process are still applicable. We acknowledge that developers will be required to obtain a water allocation from the State Department of Land and Natural Resources.

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell

Daniel Dinell
Executive Director

DD/TT/ST:ll

DEPARTMENT OF FACILITY MAINTENANCE
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 215, KAPOLEI, HAWAII 96707
TELEPHONE : (808) 692-5054 FAX: (808) 692-5857
Website: www.honolulu.gov

MUFI HANNEMANN
MAYOR

LAVERNE HIGA, P.E.
DIRECTOR AND CHIEF ENGINEER

GEORGE K. MIYAMOTO
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 05-612

June 14, 2005

Ms. Susan Tamura
Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, Hawaii 96813

Dear Ms. Tamura:

Subject: **Draft Environmental Assessment (DEA)**
Kakaako Makai Area Plan Amendment

Thank you for the opportunity to review and comment on the DEA dated May 2005 for the Kakaako Makai Area Plan Amendment.

We have no comment to offer at this time as the proposed amendments will not have an adverse impact on our maintenance operations.

Should you have any questions, please call Charles Pignataro of DRM, at 484-7697.

Very truly yours,

LAVERNE HIGA, P.E.
Director and Chief Engineer

cc: State of Hawaii-Department of Health
Wilson Okamoto Corporation

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
Governor

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Chairperson

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Ref. No.: PL EIS 6.24.3

July 13, 2005

Ms. Laverne Higa, Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
1000 Uluohia Street, Suite 215
Kapolei, Hawaii 96707

Dear Ms. Higa:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of June 14, 2005 indicated that you have no comments to offer on the subject Draft Environmental Assessment.

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell
Executive Director

DD/TT/ST:ll

R/F

RECEIVED
JUL 06 2005
WILSON OKAMOTO CORPORATION

June 30, 2005

Ms. Susan Tamura
Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, Hawaii 96813

Dear Ms. Tamura:

Subject: Draft Environmental Assessment
Kakaako Makai Area Plan Amendment
Kakaako, Oahu

Thank you for the opportunity to review and comment on the Draft Environmental Assessment relating to the proposed amendments to the Kakaako Makai Area Plan.

The Department of Parks and Recreation supports the proposed amendments that will re-introduce residential units in the Makai Area Plan's Waterfront Commercial Zone contributing to an active, people-orientated gathering place however, increasing the height limit along the Ewa Edge of Kewalo Basin from 45 feet to 65 feet, will impact Ewa view corridors from Ala Moana Beach Park, and we recommend that the height limit be maintained at 45 feet.

Should you have any questions, please contact Mr. John Reid, Planner, at 692-5454.

Sincerely,

LESTER K. C. CHANG
Director

LKCC:mk
(105244)

cc: Ms. Genevieve Salmonson, Director, Office of Environmental Quality Control
Mr. Rodney Funakoshi, Wilson Okamoto Corporation

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

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KALAELOA

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Ref. No.: PL EIS 6.24.3

July 13, 2005

Mr. Lester K.C. Chang, Director
Department of Parks and Recreation
City and County of Honolulu
1000 Uluohia Street, Suite 309
Kapolei, Hawaii 96707

Dear Mr. Chang:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of June 30, 2005 supporting the proposed amendments to the Kakaako Makai Area Plan that will allow residential use in the Kakaako Makai Area. We acknowledge your concerns regarding the height limit increase along the Ewa edge of Kewalo Basin. Increasing the height limit is being proposed to help support the creation of a viable mixed-use waterfront development.

As stated in the Draft EA, the high water table in this area precludes below-grade development. This is a considerable constraint because parking garages that could potentially be constructed underground must now be built at or above grade. The long but narrow configuration of the Kewalo parcel is also a severe development constraint.

Therefore, the height limit increase will provide greater flexibility for developers to incorporate commercial and residential uses as well as parking facilities. Based on the visual simulation included as Figure 8 of the Draft EA, we do not feel that the height limit increase will significantly impact view corridors.

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell
Executive Director

DD/TT/ST:ll

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
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RECEIVED
JUN 23 2005
WILSON OKAMOTO CORPORATION

R4F

MUFI HANNEMANN
MAYOR

HENRY ENG, FAICP
DIRECTOR

DAVID K. TANOUE
DEPUTY DIRECTOR

2005/ELOG-1121 (DW)

June 21, 2005

Ms. Susan Tamura
Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, Hawaii 96813

Dear Ms. Tamura:

Draft Environmental Assessment Report for
Kakaako Community Development District, Makai Area Plan Amendment
TMK: 2-1-015, 2-1-058, 2-1-059, and 2-1-060 (all parcels) in Honolulu, Oahu, Hawaii

Thank you for your letter of May 12, 2005 responding to our pre-assessment consultation comments and for the opportunity to review the Makai Area Plan Amendment May 2005 Draft Environmental Assessment (EA) which was prepared for the Hawaii Community Development Authority (HCDA). The HCDA proposes to amend the Makai Area Plan and Rules by: (1) reclassifying lands designated as "Commercial" to a "Mixed-Use Zone" where residential use will be permitted; (2) allowing residential use in the "Waterfront Commercial" zone; and (3) increasing the height limit in the "Waterfront Commercial" zone at the west end of Kewalo Basin from 45 feet to 65 feet. The proposed amendments integrate residential and commercial uses and it encourages the development of an "urban village" in the Kakaako Makai Area where residents can live, work, shop, and socialize.

We offer the following comments for your review and consideration for the Final EA report:

1. Section 2.2 Project Need: The Draft EA states that demographic changes on Oahu, the increasing share of Honolulu residents interested in living in a denser urban center, and additional market support from out-of-state residents will likely continue the strong demand for market-priced, for-sale units in Kakaako over the next decade. This demand is further supported by the Makai Area's waterfront location, superior views, and limited capacity for residential units. These factors, however, do not support the intended market stated in the Draft EA, specifically residential units targeted to serve the moderate price range, size, and quality level for the District's workers. On the contrary, the demographic and real estate factors described in the Draft EA support a high-end, luxury condominium market. The Final EA should address this discrepancy and, if the District's workers are the intended market, demographics on this population and proposed approaches or methods to achieve this intent should be included. These revisions should also be made to Section 3.2.2 Population and Housing.

2. Section 3.2.2 Population and Housing: This section states that affordable housing requirements similar to those set forth in the Kakaako Mauka Area Rules will also be applied to housing development in the Makai Area. Given the likelihood of high-end, luxury condominiums being developed in the Makai Area, providing affordable reserved housing units in the development may not be feasible to the developer. Alternatives such as providing reserved housing units elsewhere or making in-lieu cash payments should be discussed in the Final EA.

3. Section 3.2.4 Open Space, Recreational and Visual Resources: Increasing the maximum building height from 45 feet to 65 feet in the Waterfront Commercial (WC) zone, as illustrated in Figure 8 of the Draft EA, is not anticipated to have a significant impact since existing public views are already affected by structures. The Draft EA further states that increasing the height limit is needed because the high water table in this area precludes below-grade development. Please elaborate on this as a constraint. As stated in our pre-assessment consultation letter, we are concerned about increasing building masses close to the water. The present height of 45 feet already allows for mixed-use development that could include apartments and/or condominiums constructed above commercial uses. Compelling reason needs to be provided in the Final EA justifying the proposed amendment to increase the building height to 65 feet in the WC zone.

4. Section 3.3.1 Transportation System: The Final EA should describe the existing pedestrian network in the Kakaako Makai Area. The proposed amendments impact on the area's pedestrian network and mitigative measures, if needed, should be identified. The Final EA should also state that the Primary Urban Center Development Plan (PUC DP, June 2004) Land Use Map (A.5 PUC – Central) shows a pedestrian network in the Kakaako Makai Area that runs adjacent to Fort Armstrong, the makai edge of the Kakaako Waterfront Park, and Kewalo Basin. The purpose of the network is to link neighborhoods and enhance pedestrian mobility within neighborhoods (Section 3.5.1.4 of the PUC DP).

5. Section 3.3.1.2 Existing Traffic Conditions: A traffic impact analysis report (TIAR) should be prepared to include the impacts resulting from traffic flowing between and encompassing both the Kakaako Mauka and Makai Areas. Furthermore, a presentation should be conducted, before filing the Final EA, to include both State and City traffic and planning agencies, to discuss, in detail, the mitigation measures being proposed in the TIAR. It appears that some of the measures being presented may be very difficult to implement and should not be considered as potential mitigative measures. A reassessment of future traffic conditions may be necessary, if it is determined that these measures cannot be implemented, or alternative mitigative measures should be recommended.

6. Section 3.3.1.3 Existing Bus and Bikeway Systems: This section should be expanded to describe existing bicycle lanes, routes, and shared-use paths within the Kakaako Makai Area. It should also mention the Honolulu Bicycle Master Plan (April 1999) which provides a strategy for the bicycle component in the PUC's future transportation system. The Master Plan's "Lei of Parks" Concept Plan, shown in Figure 3.16 of the PUC DP, calls for creating links between parks by means of shared-use paths designed for recreational bicycle riding.

This Concept Plan shows existing links along the makai edge of the Kakaako Waterfront Park and connecting links along Kewalo Basin.

7. Section 3.3.3 Wastewater System: The HCDA should revise the Kakaako Community Development District Makai Area Sewer Master Plan (September 2004) to reflect the proposed amendments. Although improvements to the Makai Area's wastewater system are being undertaken as part of the HCDA's Improvement District (ID) Program, future development permitted under the proposed amendments may be limited because a majority of the downstream sewer lines are already constructed with fixed capacities. Further improvements to the existing municipal sewer lines may be necessary to support development permitted under the proposed action.

   This section should also note that sewage capacity reservation is contingent on the submittal and approval of a Site Development Division Master Application Form for Sewer Connection. Furthermore, future projects will be liable for payment of the Wastewater System Facility Charge.

   In the first sentence on page 37, change Department of Wastewater Management (WWM) to Department of Environmental Services (ENV).

8. Section 4.3.9.1 Revisions to the Makai Area Plan: The Draft EA states that the Honolulu Waterfront Master Plan study determined that the Kakaako District's residential uses should be restricted to the Mauka Area, because of certain environmental and market concerns, such as potential exclusion of lower income families from the Makai Area since higher land values would necessitate higher priced housing. This is a valid concern and should be addressed in the Final EA, especially since demographic and real estate market factors described in the Draft EA support the likelihood of higher priced housing in the Kakaako Makai Area.

9. Please make the following minor edits to Section 4.4.1 Primary Urban Center:

   - In the first sentence, insert "Urban Center" after the word "Primary."
   - Change the second sentence to read, "The PUC DP recognizes that one key redeveloping area is Kakaako and that projects in Kakaako are projected to absorb 30 percent of the PUC's future residential growth and a large portion of the region's projected commercial growth."

10. Section 4.4.2 Zoning: In the first sentence, replace "DP" with "the City's eight Development Plans and Sustainable Communities Plans."

11. Section 7, Anticipated Determination: Although this section states that adoption of the proposed amendments to the Makai Area Plan are not anticipated to have a significant impact based on the criteria set forth in the State Department of Health Rules, the anticipated determination of a "Finding of No Significant Impact" (FONSI) should be clearly stated. The anticipated determination should also be included in the Project Summary on page iv of the Draft EA.

12. Section 7 Anticipated Determination, item #6: The Draft EA states that the proposed amendments to the Makai Area Plan will not induce substantial secondary impacts such as population changes or effects on public facilities. On the contrary, the proposed amendments will permit residential development in the Kakaako Makai Area. At full development, the Makai Area is projected to have approximately 1,100 housing units and a resident population of about 2,000 (as stated in Section 3.2.2 of the Draft EA). Furthermore, public facilities will need to be upgraded to support this population increase.

This population increase, however, is considered a positive impact. It helps to fulfill the General Plan's population policy which calls for facilitating the full development of the PUC. It also fulfills one of the key elements of the PUC DP vision which is to offer in-town housing choices for people of all ages and income. With large blocks of land controlled by large landowners and infrastructure improvements in place or planned, Kakaako is considered a key redevelopment area. It is projected to absorb about 30 percent of the PUC's future residential growth. A strong residential component in the Kakaako Makai Area is essential to advancing the HCDA's goal of creating a "livable," mixed-use community.

Similarly, the projected population increase in the Kakaako Makai Area is anticipated to have substantial impacts on public facilities. However, as stated in the Draft EA, the HCDA has implemented an ID Program to systematically improve infrastructure in Kakaako.

Please call Dina Wong of my Community Action Plans Branch staff at 527-6073 if you have any questions.

Sincerely yours,

Henry Eng

HENRY ENG, FAICP
Director of Planning and Permitting

HE:lh
Doc: 377107

cc: Office of Environmental Quality Control
Wilson Okamoto Corporation

HAWAII COMMUNITY
DEVELOPMENT AUTHORITY

KAKAAKO
KALAELOA

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Ref. No.: PL EIS 6.24.3

July 13, 2005

Mr. Henry Eng, FAICP, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. Eng:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of June 21, 2005 providing comments on the Draft Environmental Assessment ("Draft EA") for the subject project. We offer the following responses in the respective order of your comments.

1. Section 2.2 - Project Need

We acknowledge that the Makai Area's favorable location could very well support the development of high-end, luxury condominiums. It is the desire of the HCDA, however, to promote the development of moderate priced housing that will be affordable to workers in the Kakaako Community Development District. To achieve this, the HCDA intends to implement policies that encourage the development of moderate priced housing in the Makai Area and housing policies that give preference to workers in the Kakaako area. These policies will be adopted as amendments to the Makai Area Rules following completion of the environmental review process.

2. Section 3.2.2 - Population and Housing

The HCDA intends to encourage the development of housing in the Makai Area for employees in the District. However, since in-lieu cash payments or the provision of reserved affordable housing units elsewhere may be permitted, these alternatives will be discussed in the Final EA.

3. Section 3.2.4 - Open Space, Recreational and Visual Resources

As stated in the Draft EA, the high water table in the Waterfront Commercial zone precludes below-grade development. This is a considerable constraint because parking garages, that could potentially be constructed underground, must now be built at or above grade. The long but narrow configuration of the Kewalo parcel is also a severe development constraint. Therefore, the height limit in the Waterfront Commercial zone is proposed to be increased to 65 feet to provide greater flexibility for developers to incorporate commercial and residential uses as well as parking facilities.

4. Section 3.3.1 - Transportation System

As requested, the Final EA will describe the existing pedestrian network in the Kakaako Makai Area and anticipated impact. The Final EA will also discuss the project's relationship to the pedestrian network shown on the Primary Urban Center Development Plan Land Use Map.

5. Section 3.3.1.2 - Existing Traffic Conditions

Meetings with State and City transportation agencies are scheduled to discuss mitigation measures. In addition, the Draft EA and traffic studies have been forwarded to the City and County of Honolulu's Department of Transportation Services and State of Hawaii Department of Transportation for review and comment. Comments received from those agencies will be incorporated into the Final EA.

We acknowledge that some of the improvements proposed by the project's traffic impact analysis report will require substantial coordination with City and State traffic and planning agencies and the HCDA intends to closely coordinate traffic improvements with these agencies.

6. Section 3.3.1.3 - Existing Bus and Bikeway Systems

As requested, the Final EA will further describe existing bicycle lanes, routes, and shared use paths in the Kakaako Makai Area and the project's relationship to the Honolulu Bicycle Master Plan.

7. Section 3.3.3 - Wastewater System

We acknowledge that future development in the Kakaako Makai Area may be limited because downstream sewer lines are already constructed with fixed capacities and that further improvements may be necessary to support the proposed development. The HCDA will continue to coordinate its Sewer Master Plan with your Department. As requested, the Final EA will note that sewage capacity reservation is contingent on the submittal and approval of a Site Development Division Master Application Form for Sewer Connection and that projects will be liable for payment of the Wastewater System Facility Charge.

8. Section 4.3.9.1 - Revisions to the Makai Area Plan

We acknowledge that the Makai Area's favorable location and amenities could support the development of higher priced residential developments. However, all residential development should not be excluded on the basis that the resultant development will not provide affordable housing. As with other residential developments in desirable coastal locations, the developer has the option to provide his affordable housing requirement on-site, off-site, or on an in-lieu fee basis. The HCDA intends to adopt rules to promote the development of moderate priced housing targeted to workers in the Makai Area.

9. Section 4.4.1 - Primary Urban Center

The requested changes will be incorporated in the Final EA.

10. Section 4.4.2 – Zoning

As requested, we will replace "DP" with "the City's eight Development Plans and Sustainable Communities Plans."

11. Section 7 - Anticipated Determination

We acknowledge that the anticipated determination of "Finding of No Significant Impact" should have been stated in Section 7 of the Draft EA and in the Project Summary.

12. Section 7 - Anticipated Determination, item #6

As stated in the Draft EA, the proposed amendments to the Makai Area Plan could increase population in the Makai Area by about 2,000. We did not consider this population change a secondary impact, but rather a direct impact that was addressed in Section 3.2.2 of the Draft EA. With regard to impacts to public facilities, the demand on public infrastructure generated by residential use will largely replace demand that would have been generated by commercial developments. The other major public facilities impacted – schools and parks, are separately assessed with appropriate accommodations.

We agree that a strong residential component in the Kakaako Makai Area is essential to advancing the HCDA's goal of creating a "livable", mixed-use community.

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell
Executive Director

DD/TT/ST:ll

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX: (808) 523-4730 • INTERNET: www.co.honolulu.hi.us

RECEIVED
JUN 24 2005
WILSON OKAMOTO CORPORATION
RYF

MUFI HANNEMANN
MAYOR

EDWARD Y. HIRATA
DIRECTOR

TP5/05-104664R

June 22, 2005

Ms. Susan Tamura
Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, Hawaii 96813

Dear Ms. Tamura:

Subject: Kakaako Makai Area Plan Amendments

Thank you for the May 16, 2005 letter from Wilson Okamoto Corporation, requesting our review of and comments on the draft environmental assessment (EA) for the subject plan amendments. We have the following comments as the result of our review:

1. For the Year 2009 traffic impact analysis (Page 27), the EA assumes that certain traffic improvements will already have been implemented by the State. It should also address the scenario in which these improvements are not made.

2. Section 3.3.1.3 (Pages 35 and 36) discusses the existing bus system and the impacts of the proposed plan amendments.

   a. The fourth sentence that states that buses typically carry less than seated loads on the portion of the routes between Ala Moana Center and Downtown Honolulu is inaccurate. During the peak hours, all routes are heavy; with some routes being heavy all day long.
   b. This section should also describe and discuss the impact on paratransit/TheHandi-Van service.
   c. In addition to expanding the discussion on the impact that the plan amendments would have on the bus system, the EA should also propose possible mitigation measures.

Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

EDWARD Y. HIRATA
Director

cc: Ms. Genevieve Salmonson
Office of Environmental Quality Control

Mr. Rodney Funakoshi
Wilson Okamoto Corporation

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

KAKAAKO KALAELOA

Linda Lingle
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Ref. No.: PL EIS 6.24.3

July 13, 2005

Mr. Edward Hirata, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Dear Mr. Hirata:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of June 22, 2005 providing comments on the Draft Environmental Assessment ("Draft EA") for the subject project. We offer the following responses in the respective order of your comments.

1. The only improvement that the project's traffic impact analysis assumed would be implemented by the State by 2009 is the extension of Punchbowl Street to Ilalo Street. This assumption is reasonable because the extension of Punchbowl Street is a vital component of the Makai Area circulation plan and would be needed before more intensive development occurs in this area.

2. a. The Final EA will be revised to state that during peak hours, ridership of all bus routes are heavy and that some routes are heavy throughout the day.

   b. The Final EA will be revised to state that paratransit/TheHandi-Van service may be impacted by residential developments in the Makai Area.

   c. As stated in the Draft EA, a possible measure that may be implemented to mitigate impact to the bus system is to provide a shuttle service that would connect the Makai Area with the Kakaako Mauka Area, downtown Honolulu and Aloha Tower. In addition, since the Kakaako Makai area is anticipated to be a mixed-use community, it is anticipated that residents will be able to walk to shopping, dining, employment, and recreational destinations.

We appreciate your participation in the environmental review process.

Sincerely,

Daniel Dinell
Executive Director

DD/TT/ST:ll

Kakaako IMPROVEMENT ASSOCIATION

Sent to Dan today
T

P.O. Box 3776 Honolulu, Hawai'i 96812

June 15, 2005

RECEIVED
2005 JUN 17 AM 9 19
HAWAII COMMUNITY DEVELOPMENT AUTHORITY

Mr. Daniel Dinell, Executive Director
Hawaii Community Development Authority
677 Ala Moana Blvd
Suite 1001
Honolulu, Hawaii 96814
(By hand delivery)

Dear Mr. Dinell:

The Kakaako Improvement Association (KIA) hereby transmits its comments on the draft Environmental Assessment for the proposed amendments to the Makai Area Plan:

General:

: The document is prepared as if it were a brief for the advocacy of residential use in the Makai area rather than an objective evaluation of impacts arising from such an allowance.

: It is deficient in properly depicting the proposed extent of zone changes to the MUZ.

: The discussion of the main issue, i.e., impacts of residential development and population is too limited to qualify as one that fully covers possible impacts

: It is deficient in its discussion of impacts on schools, school needs and mitigation measures: The Department of Education was not even consulted in the EA process.

: It is deficient in its discussion of relationships to county plans, policies and objectives.

: The EA is deficient in that it failed to identify and discuss ceded lands and, to include the Office of Hawaiian Affairs as a consulted party.

: The EA is deficient in that it failed to address the impact and public policy on the sale of State Public lands in the Makai Area as the last state owned waterfront area.

: The discussion under section 3.2.2, Population and Housing appears skewed by unrealistic assumptions and consequently is difficult to accept as an incisive picture of what actually will result from residential development in the Makai area.

: The "no significant impact" determination appears pre-determined, forced, and inconsistent with the inherent significance of the proposal to alter the character of future development in the Makai area as well as the 'significance criteria" of the Office of Environmental Quality.

: A finding of no significance" also belies the obviously significant traffic impacts already foreseen and discussed in the EA.

: An Environmental Impact Statement is necessary to remedy the deficiencies of the EA, to expand evaluations of incompletely covered areas, to evaluate areas not covered and to conform to the "significance criteria" of the OEQC.

Detail:

1. **The EA is not objective**: The Guidebook for the Hawaii State Environmental Process describes an EA as an "informational document" used to evaluate the possible environmental effects of a proposed action. Consequently, an EA has to be a comprehensive, objective and incisive description of environmental impacts expected from a proposed action and an evaluation of the significance of these impacts.

   The Makai Area EA transcends this purpose by its strong subjective advocacy of the proposed action. This advocacy produced an entire section entitled "Project Need" as number 2.2 of the document. This section, about 1/1/2 pages long generally argues that the proposed action is not only justified but "essential." In its fervor to support the proposal, it states, "In order to achieve these planning goals, residential use must be allowed and encouraged in the Makai area," (emphasis added).

   Given this apparent bias, the objectivity of the findings and evaluations of the entire document are open to question.

2. **EA does not adequately describe the portion of the Makai area that will be subject to residential development.** The EA only specifies that 62.1 acres of commercial is proposed to become MUZ but never specifies whether these 62.1 acres includes the 22+ acres of waterfront commercial area where residential use is proposed also. Is the projection of 1100 residential housing units described in Section 3.2.2, Population and Housing based on either areas or just the MUZ area as it appears from "ball-park" calculations?

3. **Discussion of the impacts of allowing residential use extensively in the Makai area is inadequate.** The proposed change is a 180 º from the present plan policy and direction and would change the dominant character of future development in the Makai area significantly. Again the document talks of the subjective concepts of "livability" and "sustainability" and relates the proposal to developments in Seattle, Kirkland (WA), Portland and Vancouver, on the mainland. But these references are not "impacts" and the document needs to concentrate on the impacts of residential use on what has been called by the "Eye on Makai" participants as "Oahu's last great waterfront property" and a natural resource that should be afforded some general public use and access in Kakaako-Makai. It fails, for instance, to adequately look at school need impacts from residential development and contains no discussion at all about how the proposal relates to the General Plan of the City & County of Honolulu and its population guidelines. It does talk about a policy of preventing "sprawl" but Oahu is not threatened with sprawl and has a policy of directing growth to the Ewa (Second City) area.(also not discussed by the EA)

   The EA describes the nature of residential development as consisting of 1100 condominium units, 60-70% of which will be purchased by local residents who are employed in the surrounding area(without projecting the employment profile of these workers) and have no children of school age. The price range of these condo units in this premium setting is pegged at $350,000. The EA assumes that there is or will be, a movement back to the central city from the "suburbs" but offers no data to corroborate such a trend. The EA does not project how many local residents will actually take up residence in these condo units and fails to discuss the established trend of local residents initially purchasing new condo units "on spec" for later sale at an inflated price to others nor the effect of this practice on pricing. It also does not project how many Makai residents will be in the 9,600 employees projected for the Makai area nor relate the impacts of the resident population together with the worker population. How will the parking requirements for these numbers be accommodated?

   These assumptions are difficult to reconcile with the reality of past development and real estate activity without further corroboration. . The items discussed by the EA consequently are not readily credible while many items relating to residential development are not discussed (See additional comments below).

4. **School Need Impacts are virtually absent.** No children of school age are cited in the population spawned by residential use by the EA or any children showing up there will go to private school. Even though the EA assumes impacts, these impacts are not enumerated and the issue is dealt with by telling us that residential development here will produce less school impacts

than single-family development (was single-family development an option?) HCDA will continue to coordinate with DOE on school needs. This is unacceptable. The public and the HCDA need to know what impacts in this area are projected from the proposed use, that's why the EA is being done. From HCDA involvement in the recent past, it is known that the schools in the affected service area are presently overcrowded and DOE has broached the need for a new school in Kakaako-Mauka and the failure of the EA consultant to consult with DOE on this issue is a glaring deficiency. Some discussion of school needs, and DOE's input is necessary before the document can be regarded as complete and as a credible decision-making tool for future planning.

5. **The EA is deficient in its discussion of Relationship to County Plans, Policies and Objectives.**

   While the EA devotes some 10 pages to the relationship of the proposal to state plans and policies, it devotes one 2" paragraph to its relationship to county plans. This appears unbalanced since it is the City & County of Honolulu that will be directly affected by the proposal. The EA does not even mention the policies of the General Plan of the C & C of Honolulu w which contains population control, population distribution and directed growth policies, the relationship of which to the proposed action requires discussion.

   The city's General Plan population distribution guidelines prescribe that the Primary Urban Center (Central Honolulu) hold from 45 -49% of Oahu's population. The area now contains 47% of Oahu's population. Avoiding a discussion of the impact on county plans on the basis that HCDA action doesn't have to comply with county plans would also be in the category of irresponsible planning.

6. **Fire Control and EMS services not adequately covered.** The document is deficient in its discussion of potential impacts in the area of emergency medical service and fire control. Neither the Honolulu Fire Department or the EMS were consulted and the change from commercial, industrial, and public land uses to over 2,000 residents in hi-rise structures would have implications to both of those service agencies. Are the capabilities of The Honolulu fire Department sufficient to adequately serve the needs of hi-rise towers in that location? Is access adequate to allow fire and ambulance vehicles to get in and out in efficient fashion? Will traffic impacts impede service?

7. **The EA is also deficient in its several declarative statements that are made without reference to source material.** For instance :

: The EA states (page 22) that the proposed action will lead to higher property taxes yet there is no corroborating data to back this up;

: The EA states (page 24) that the proposed action will have no impact on open space requirements with no back-up data or discussion.

: The EA states (page 60) that a "no action" situation would forego the provision of "much-needed" housing in central Honolulu yet there is no basis provided for the finding that housing in central Honolulu is "much-needed."

: The EA states (page 24) that residential use will increase demand for recreational use but says facilities are sufficient to handle it. There is no back-up discussion to corroborate this finding to show the demand, the sufficiency and the degree to which recreational facilities will be utilized by resident population, employees and/or outside resident use.

: The EA states (page 24) that view planes will only be marginally affected by the proposed increase in building heights without back-up data to enable one to gauge what is "marginal."

: The EA states (page 60) that multi-family housing development will provide a critical mass to support commercial development in the area. No data is provided to provide insight into why commercial development in the Makai area needs a "critical mass to survive, the size of such a "mass" and how it relates to and effects the plan element of a bio-med research uses.

: No plan orientation to uses for the general public to enjoy this prime location, deemed a natural resource, is discussed.

8. **Traffic impacts alone are quite "significant."** The assessment of traffic impacts alone seems to merit a determination that significant impacts will occur from the proposed action and an Environmental Impact Statement is necessary. We fail to understand why a drop in the Level of Service (LOS) for the majority of streets in the area from D and E LOS to E and F, the lowest LOS doesn't constitute a "significant" impact from the proposed action. The state legislature seems to think that future traffic congestion in the area is a serious problem since the 2005 legislative session produced a bill (HB-100, HD1, SD1, CD1) appropriating $500,000 for a Kakaako traffic study.

9. **An Environmental Impact Statement is fully merited.** The 180 degree change from present development objectives to the proposed action and the irrevocable nature of its implications once the land use development occurs is substantial enough to merit, and require, an EIS. Traffic impacts are obviously

"significant'. An EIS is also necessary to remedy the deficiencies noted above. and to add corroborative justification for EA statements made without reference to source material. On the basis of comments made above, we believe that at least four "significance criteria" are relevant, i.e., (1) The proposed action involves an irrevocable commitment to loss or destruction of a natural and cultural resource.(our central city shoreline area); (2) Curtails the range of beneficial uses of the environment (by loss of public land and the exclusion of public use areas); (4) Substantially affects the economic and social welfare of the community; and (6) Involves substantial secondary impacts such as population changes or effects on public facilities.

Very truly yours,

Beverly Wolff Harbin, Co-Chair
Government Affairs Committee

Donald A. Bremner, Co-Chair
Government Affairs Committee

cc: OEQC

HAWAII COMMUNITY DEVELOPMENT AUTHORITY

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Ref. No.: PL EIS 6.24.3

July 13, 2005

Ms. Beverly Wolff Harbin, Co-Chair
Mr. Donald A. Bremner, Co-Chair
Government Affairs Committee
Kakaako Improvement Association
P. O. Box 3776
Honolulu, Hawaii 96812

Dear Ms. Harbin and Mr. Bremner:

Re: Draft Environmental Assessment
Kakaako Community Development District Makai Area Plan
Honolulu, Hawaii

Thank you for your letter of June 15, 2005 regarding the subject Draft Environmental Assessment ("Draft EA"). We appreciate your review of the subject document and offer the following comments in the respective order of your detailed comments.

1. *The EA is not objective.*

The discussion in the Project Need section of the EA is intended to communicate the project purpose and objectives. It explains why the Hawaii Community Development Authority (HCDA) believes the Makai Area Plan amendments are important to be pursued and what they are intended to accomplish. It is advocacy by nature, as it reflects the proposing agency's intent and desires for the future development of the area. Nearly all EA and EIS documents that we prepare, and most other environmental assessments that we are aware of, include such a statement of purpose and need.

2. *EA does not adequately describe the portion of the Makai area that will be subject to residential development.*

The proposed action is a land use plan change to allow a mix of uses consistent with contemporary urban design, rather than only commercial uses (single-use zoning) in the Makai Area. The intent of a mixed-use zone is to provide maximum flexibility to allow public agencies and potential developers to respond to market needs and conditions. The proposed Makai Area Plan and Rules do not stipulate particular uses on specific sites, rather it allows a variety of uses that will support the live, work, learn and play community we envision for the Makai Area.

Although we did not pre-determine the areas of residential development, we did provide our best guess of where and when residential and other commercial development may occur. Table 1 of the Transportation Plan in Appendix A of the Draft EA provides anticipated uses of the various parcels to enable an assessment of potential traffic impacts for Makai Area developments.

The referenced 62 acres of Commercial does not include the Waterfront Commercial acreage, this will be clarified in the Final EA.

3. *Discussion of the impacts of allowing residential use extensively in the Makai Area is inadequate.*

We believe that allowing residential use would not change the dominant character of future development in the Makai Area. The vision for the Makai Area is still to create an active, vibrant area through a variety of new developments, including expansive public areas and parks, maritime uses along the harbor, restaurants, markets, entertainment along Kewalo Basin, educational and research facilities as well as residential and commercial developments.

You do specify inadequate discussion of school need impacts and lack of reference to the General Plan provisions of the City and County of Honolulu. These issues are discussed in the responses to Comment Nos. 4 and 5 below.

A Residential Use and Demand study was undertaken in February 2005 in conjunction with the proposed land use changes. The EA references the study findings to the extent that it relates to environmental disclosure. Readily available demographic data suggest the trend back to the central city, including a rising middle-aged populace from 50 to 65 years of age who are able to live in a smaller place because their children have grown and left home, persons who may have significant real estate equity accumulated, and early retirees interested in down-sizing. This has been the clear trend evident from strong sales at the nearby developments in Kakaako. The majority of the local buyers would be expected to purchase their unit as a primary residence. If necessary, constraints may be imposed to ensure workers homes as well as "reserved" housing.

For purposes of the traffic study, it was projected that approximately 20 percent of Makai residents would be employed in the Makai area. Parking needs have been fully accounted for based on allowable densities and HCDA's development requirements.

4. *School need impacts are virtually absent.*

We concur with your comments regarding our discussion of school impacts. While we believe that the proposed residential allowance will not generate significant student populations, these should have been quantified and assessed. We also should have consulted with the Department of Education (DOE), and have recently provided them with a copy of the Draft EA for their review.

Although a broad range of household types could be expected in the Makai Area, our residential demand study finds that many are likely to be empty nesters (older couples with adult children who have moved out), and couples and singles without children, typical of tenants in an urban apartment lifestyle. While the demand on school facilities is likely to be less, the EA will be revised as follows to reflect the potential for student generation based on DOE planning criteria for student enrollment and the capacity of existing school facilities in the area.

The DOE's standard for projecting elementary school student enrollment is 21 students per 100 new housing units. Based on our residential demand study, up to 70 percent of buyers will be local residents with primary residence in the Makai Area. This translates to the need to accommodate 162 students based on the anticipated 1,100 residential units.

Royal Elementary School has a current enrollment of 407 students, with a capacity for up to 430 students. Kaahumanu Elementary School has a current enrollment of 613 students, with a capacity for 716 students. In addition to these two traditional public schools, two public charter schools are also located in the District.

As enrollments at public schools are near capacity, the HCDA intends to coordinate educational facility requirements with the DOE to ensure that projected demands on school facilities can be addressed. One near term option is to provide additional facilities for charter school operations. In addition, the former Pohukaina School property has been designated and planned as the site for a future elementary school.

5. *The EA is deficient in its discussion of Relationship to County Plans, Policies and Objectives.*

We have reviewed the City and County of Honolulu's plans and policies and did not note any conflicts with these plans, including those relating to population growth and distribution. As a matter of fact, the City's Primary Urban Center Development Plan projects that Kakaako will absorb about 30 percent of the Primary Urban Center's future residential growth. A more detailed discussion of conformance with the City's Development Plan policies will be provided in the Final EA.

6. *Fire Control and EMS services are not adequately covered.*

Inasmuch as this is a land use plan amendment as opposed to a specific development proposal, more in-depth discussion and consultation with these fire and emergency medical service agencies were not pursued as part of this EA.

7. *The EA is also deficient in its several declarative statements that are made without reference to source material.*

- *The EA states (page 22) that the proposed action will lead to higher property taxes yet there is no corroborating data to back this up.*

  The HCDA's Waterfront Business Plan estimated that $750,000 in new annual real property taxes will be generated for the City and County of Honolulu. This statement will be added in the Final EA.

- *The EA states (page 24) that the proposed action will have no impact on open space requirements with no back-up data or discussion.*

  Except for the Kewalo waterfront, allowable height and densities will not be modified with the proposed action. As such, there will be no impact on open space resources. This clarification will be added in the Final EA.

- *The EA states (page 60) that a "no action" situation would forego the provision of "much needed" housing in central Honolulu yet there is no basis for the finding that housing in Central Honolulu is "much-needed".*

  The phrase "much needed" will be deleted from the sentence in the Final EA. We note, however, that the City's Primary Urban Center Development Plan is counting on Kakaako to absorb 30% of the expected future residential growth. Thus, housing in the Makai Area supports the City's General Plan.

- *The EA states (page 24) that residential use will increase demand for recreational use but says facilities are sufficient to handle it. There is no back-up discussion to corroborate this finding to show the demand, the sufficiency and the degree to which recreational facilities will be utilized by resident population, employees and/or outside resident use.*

  The Final EA will include the following discussion on the with regard to recreational requirements for Makai Area residents:

  The City and County of Honolulu's park area requirements specify 110 square feet of park space per multi-family dwelling. Assuming 1,100 multi-family residential units are developed in the Makai Area, this translates to the need for 121,000 square feet of park space, or 2.8 acres. This requirement is more than satisfied by the Waterfront Park, the Gateway Park, and the Kewalo Basin Park which total approximately 40 acres.

- *The EA states (page 24) that view planes will only be marginally affected by the proposed increase in building heights without back-up data to enable one to gauge what is "marginal".*

  A photographic rendering was provided on Page 25 of the Draft EA to enable visualization of what we consider to be a marginal affect on building heights.

- *The EA states (page 60) that multi-family housing development will provide a critical mass to support commercial development in the area. No data is provided to provide insight into why commercial development in the Makai area needs a "critical mass to survive, the size of such a "mass" and how it relates to and effects the plan element of a bio-med research uses.*

  The Waterfront Business Plan states that residences and commercial offices are needed to generate consumer traffic. Residents are needed to fulfill the inclusive work-live-shop-recreate lifestyle for an urban village. With regard to critical mass, residents and their guests will form a small but much needed consumer core to support commercial uses.

- *No plan orientation to uses for the general public to enjoy this prime location, deemed a natural resource, is discussed.*

  Section 3.2.4, Open Space, Recreational and Visual Resources includes a discussion on the Makai Area's oceanfront and recreational public resources.

8. *Traffic Impacts alone are quite "significant".*

Traffic impacts are a major factor in this EA, but the impacts from the allowance of residential use are less than what is presently allowed with Commercial uses. Commercial uses (retail and office) are much higher generators of traffic than residential uses. The allowance of residential uses will also somewhat redistribute the circulation of traffic in the Makai Area -- residents would be exiting the Makai Area in the morning while office-commercial employees are entering the Makai Area. What the traffic study has done is update the traffic data, incorporate residential travel patterns, and propose mitigation measures to maintain acceptable traffic levels of service in the area.

9. *An Environmental Impact Statement is fully merited.*

We respectfully disagree with your conclusion. A Supplemental EIS was prepared for the Kakaako Makai Area in 1998 which fully assessed the impacts of the Makai Area Land Use Plan. The only proposed changes to this Land Use Plan are the allowance of residential uses in a Mixed Use context and an increase in the allowable height of the Kewalo waterfront from 45 to 65 feet. We believe we have properly assessed the relevant impacts of residential uses in the Draft EA and that a Finding of No Significant Impact is warranted. Further, residential use within the Makai Area was fully assessed in a Supplemental EIS in October 1994.

We appreciate your review and comments on the Draft EA. HCDA would also like to extend an offer to meet with the Kakaako Improvement Association, or its board, at their convenience to present the findings of our consultants and discuss more specifically your concerns.

Sincerely,

Daniel Dinell

Daniel Dinell
Executive Director

DD/TT/ST:ll

APPENDIX A

Transportation Plan
Kakaako Community Development District
Makai Area

KAKAAKO COMMUNITY DEVELOPMENT DISTRICT

MAKAI AREA

TRANSPORTATION PLAN

Prepared for:

Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, Hawaii 96813

Prepared by:

Wilson Okamoto Corporation
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Honolulu, Hawaii 96826
WOC Ref. #7246-01

May 2004

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I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to prepare a transportation plan for the Kakaako Community Development District Makai Area in Honolulu on the island of Oahu. The Kakaako Makai Area encompasses approximately 221 acres and is located south of Ala Moana Boulevard between Ala Moana Park and Aloha Tower.

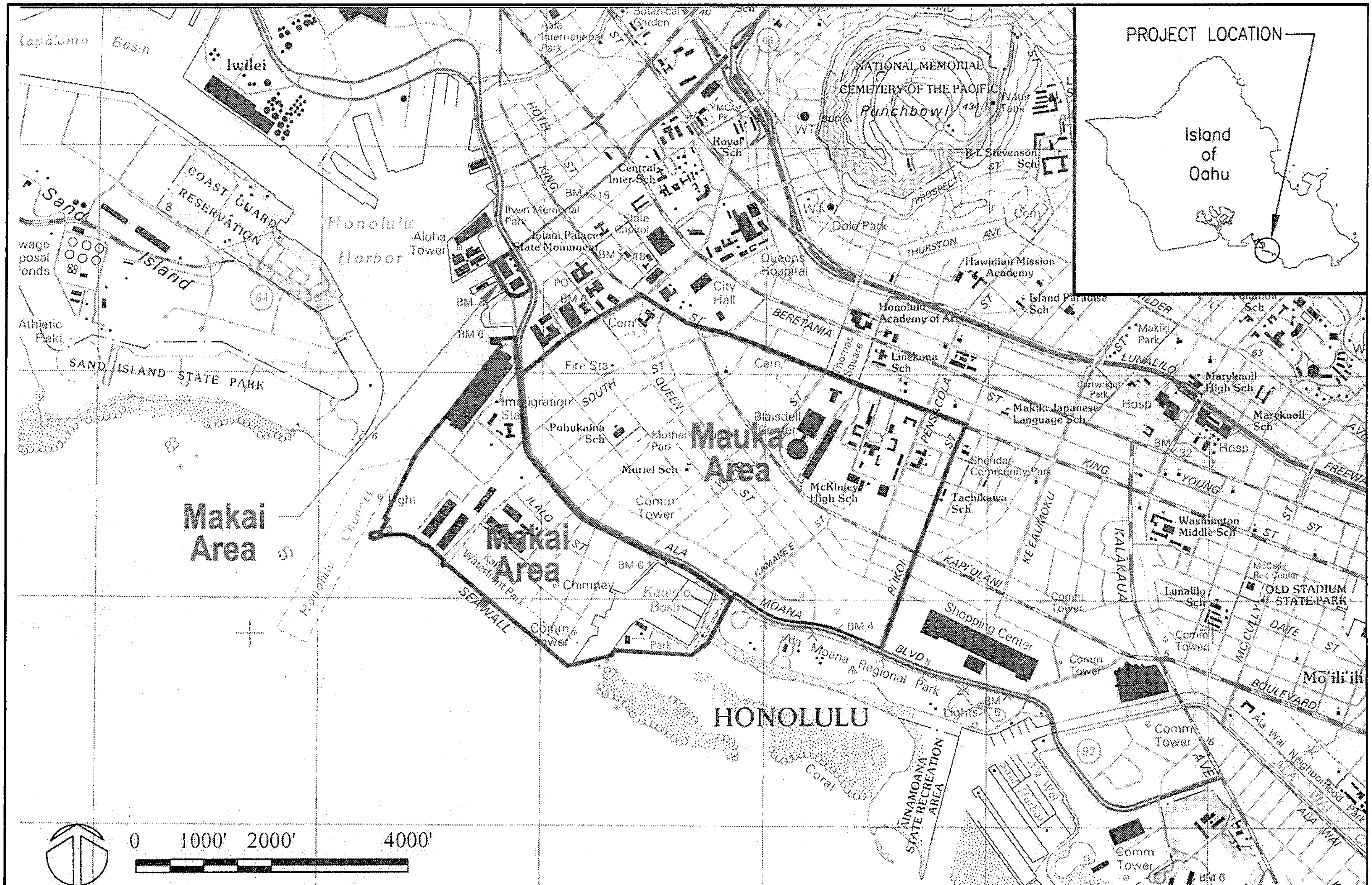
B. Scope of Study

This report presents the findings and conclusions of the traffic assessment, the scope of which includes:

1. Description of the proposed projects.
2. Evaluation of existing roadway and traffic operations in the vicinity.
3. Analysis of future roadway and traffic conditions with the proposed project.
4. Analysis and development of trip generation characteristics for the proposed projects.
5. Superimposing site-generated traffic over future traffic conditions.
6. The identification and analysis of traffic impacts resulting from the proposed projects.
7. Recommendations of improvements, if appropriate, that would mitigate the traffic impacts resulting from the proposed projects.

II. PROJECT DESCRIPTION

The Kakaako Community Development District, originally established by the Hawaii Legislature in 1976, has been divided into a Mauka Area and a Makai Area. The Kakaako Makai Area encompasses approximately 221 acres and extends Makai of Ala Moana Boulevard between Ala Moana Park and Aloha Tower (see Figure 1). The Kakaako Makai Area Plan, which was last revised in 1998, sets forth the development objectives and rationale for the orderly redevelopment of the Kakaako Community Development District's Makai Area. The current Makai Area Plan allows for a mix of commercial, waterfront commercial, public, and maritime industrial uses. The Hawaii Community Development Authority (HCDA) is proposing to amend the Makai Area Plan and Rules to allow residential



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ENGINEERS - PLANNERS

KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

LOCATION MAP

FIGURE 1

use in the Kakaako Makai Area. A Mixed-Use zoning district (MUZ) will be established where residential, commercial and public uses will be allowed. Residential use will also be allowed in the present Waterfront Commercial zone. About 62.15 acres presently designated as Commercial and 22.3 acres designated as Waterfront Commercial will be affected by the proposed amendments. The existing MUZ-I zone will be unchanged and will continue to support maritime activities and facilities within Honolulu Harbor and limited commercial activities.

A development schedule for the implementation of the proposed Makai Area Plan was prepared with the assistance of the HCDA. The schedule provides target dates for development of selected parcels in the Makai Area as well as commercial/office floor area and residential units that may be developed. In general, it was assumed that parcels would be developed at 90% of their maximum allowed floor area ratio. A summary of the proposed development schedule is provided in Table 1.

Table 1: Development Plan and Schedule

Development Date	Lot No.*	Lot Size (Sq Ft)	Proposed Zoning	Existing Use	Anticipated Use
2009	7B	81,893	MUZ	-	Office/ Commercial
	8	143,748	MUZ	Honolulu Ford	Office/ Commercial
	13	239,580	MUZ	-	Office
	15/16	431,244	MUZ	-	JABSOM
2014	10	95,832	MUZ	Pflueger Honda	Residential
	14	230,868	MUZ		Office
	21A	174,240	MUZ		Parking Structure
	21B	152,460	MUZ		Residential
	22	579,348	WC	Kewalo Shipyard, Fisherman's Wharf Restaurant, John Dominis Restaurant, Pacific Biosciences Research Center	Residential (Parking on-site)/ Commercial (Parking provided on Lot 21)
	23	392,040	WC	Kewalo Basin Marine Mammal Laboratory, National Marine Fisheries Service	Commercial

*See Figure 2

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KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

PROJECT SITE PLAN

FIGURE 2

Table 1: Development Schedule (Cont'd)

Development Date	Lot No.*	Lot Size (Sq Ft)	Proposed Zoning	Existing Use	Anticipated Use
2025	4	143,748	MUZ	-	Office/ Commercial
	5	45,738	MUZ	-	Office/ Commercial
	11	130,680	MUZ	Cutter Ala Moana (Storage only)	Residential
	12	95,832	MUZ	State Office Building	Residential/ Commercial
	20	405,108	MUZ	Look Laboratory	Public (parking provided on Lot 21)

By 2009 over 1,500,000 square feet of office and commercial floor area is anticipated to be developed in the Makai Area. Projects expected to be completed during this period include the new John A. Burns School of Medicine, the proposed Cancer Research Center of Hawaii, and a new commercial development along Ala Moana Boulevard. By 2014 an additional 640,000 sq. ft. of commercial and office floor area and 625 residential units are anticipated to be developed. Much of the commercial space anticipated to be developed during this period is associated with redevelopment of the Kewalo Basin waterfront area. Finally, between 2014 and 2025, an additional 555,000 sq. ft. of office and commercial floor area and 438 residential units are expected to be developed.

The Kakaako Makai Area is envisioned to be developed as a walkable, mixed-use community where people can live, work, shop, and play to reduce the dependence on private automobiles. In addition to private automobiles, the multi-modal transportation system serving the Makai Area will include inter-connected pedestrian pathways, bikeways, and the City's transit system.

III. EXISTING TRAFFIC CONDITIONS

A. General

The Kakaako Community Development District Makai Area is located south of Ala Moana Boulevard in Honolulu. Ala Moana Boulevard serves as major arterial providing access along the southeast coast of Oahu between its connection to Nimitz

Highway near the central business district and its terminus at Kalakaua Avenue at the west end of Waikiki. In recent years, traffic volumes along Ala Moana Boulevard within the vicinity of the Kakaako Makai Area have not increased significantly since most of the surrounding areas have already been built out.

B. Area Roadway System

In the vicinity of the Kakaako Makai Area, Ala Moana Boulevard is a predominantly seven-lane, two-way State of Hawaii roadway generally oriented in the east-west direction. At the western edge of the project area, Ala Moana Boulevard intersects Punchbowl Street. At this signalized intersection, the eastbound and westbound approaches of Ala Moana Boulevard have three lanes that serve through traffic movements. Punchbowl Street serves as a main collector roadway that originates as a predominantly four-lane, one-way (southbound) City and County of Honolulu roadway at Ala Moana Boulevard and converts to a predominantly four-lane, two-way roadway at King Street until its terminus near the H-1 Freeway. At the intersection with Ala Moana Boulevard, the southbound approach of Punchbowl Street has four southbound lanes that serve left-turn and right-turn traffic movements.

Approximately 825 feet southeast of the intersection with Punchbowl Street, Ala Moana Boulevard intersects South Street and Forrest Avenue. At this signalized intersection, the eastbound approach of Ala Moana Boulevard has four lanes that serve left-turn, through, and right-turn movements while the westbound approach has three lanes that serve through and right-turn traffic movements. On the north side of the intersection, South Street serves as a collector roadway through Kakaako that originates as a predominantly four-lane, two-way City and County of Honolulu roadway at Ala Moana Boulevard and converts to a predominantly four-lane, one-way (northbound) roadway at Pohukaina Street until its terminus near Kapiolani Boulevard and King Street. At the intersection with Ala Moana Boulevard, the southbound approach of South Street has two lanes that serve left-turn, through, and right-turn traffic movements with a posted sign indicating that right-turn movements are prohibited on red. On the south side of the intersection, Forrest Avenue is a two-lane, two-way, City and County of Honolulu roadway generally oriented in the north-south direction between Ilalo Street and Ala Moana Boulevard. At the intersection with Ala Moana Boulevard, the northbound approach of Forrest Avenue has one lane that serves all traffic movements.

Approximately 450 feet southeast of the intersection with South Street and Forrest Avenue, Ala Moana Boulevard intersects Keawe Street. At this signalized intersection, the eastbound and westbound approaches of Ala Moana Boulevard have four lanes that serve left-turn, through, and right-turn traffic movements. Keawe Street is a two-lane, two-way City and County of Honolulu roadway generally oriented in the north-south direction between Ilalo Street and Queen Street. At the intersection with Ala Moana Boulevard, the northbound and southbound approaches of Keawe Street are slightly offset with one lane on each approach serving all traffic movements.

Approximately 400 feet southeast of the intersection with Keawe Street, Ala Moana Boulevard intersects Coral Street. At this signalized intersection, the eastbound and westbound approaches of Ala Moana Boulevard have four lanes that serve left-turn, through, and right-turn traffic movements. Coral Street is a two-lane, two-way City and County of Honolulu roadway generally oriented in the north-south direction that consists of two short segments. The southern segment originates at Ilalo Street and terminates at Pohukaina Street and the northern segment extends between Halekauwila Street and Queen Street. At the intersection of with Ala Moana Boulevard, the northbound and southbound approaches of Keawe Street are slightly offset with one lane on each approach serving all traffic movements.

Approximately 375 feet southeast of the intersection with Coral Street, Ala Moana Boulevard intersects Cooke Street. At this signalized intersection, the eastbound and westbound approaches of Ala Moana Boulevard have four lanes that serve left-turn, through, and right-turn traffic movements. Cooke Street is a predominantly four-lane, two-way City and County of Honolulu roadway that serves as a collector roadway through Kakaako between Ilalo Street and South King Street. At the intersection with Ala Moana Boulevard, the northbound and southbound approaches of Cooke Street have two lanes that serves left-turn, through, and right-turn traffic movements.

Approximately 150 feet east of the intersection with Cooke Street, Ala Moana Boulevard intersects Ohe Street. At this unsignalized intersection, the eastbound and westbound approaches of Ala Moana Boulevard have three lanes that serve through and right-turn traffic movements. Ohe Street is a two-lane, two-way City and County of Honolulu roadway generally oriented in the north-south direction between Olomehani Street and Halekauwila Street. At the intersection with Ala Moana Boulevard, the northbound and southbound approaches of Ohe Street have one lane that serves right-turn traffic movements only.

Approximately 200 feet east of the intersection with Ohe Street, Ala Moana Boulevard intersects Koula Street. At this signalized intersection, the eastbound and westbound approaches of Ala Moana Boulevard have four lanes that serve left-turn, through, and right-turn traffic movements. Koula Street is a two-lane, two-way City and County of Honolulu roadway generally oriented in the north-south direction between its origin near the waterfront and its terminus at Halekauwila Street. At the intersection with Ala Moana Boulevard, the northbound and southbound approaches of Koula Street have one lane that serves left-turn, through, and right-turn traffic movements.

Approximately 825 feet east of the intersection with Koula Street, Ala Moana Boulevard intersects Ward Avenue and Ilalo Street. At this signalized intersection, the eastbound approach of Ala Moana Boulevard has four lanes that serve left-turn, through, and right-turn traffic movements while the westbound approach has five lanes that serve all traffic movements. On the north side of the intersection, Ward Avenue is a predominantly four-lane, two-way City and County of Honolulu roadway that serves as a north-south oriented collector roadway generally between Ala Moana Boulevard and Prospect Street. At the intersection with Ala Moana Boulevard, the southbound approach of Ward Avenue has three lanes that serve left-turn, through, and right-turn traffic movements. On the south side of the intersection, Ilalo Street is a two-lane, two-way City and County of Honolulu roadway that heads south towards the waterfront then turns west to run parallel with Ala Moana Boulevard through the Kakaako Makai Area until its terminus at Forrest Avenue. At the intersection with Ala Moana Boulevard, the northbound approach of Ilalo Street has three lanes that serve all traffic movements.

C. Traffic Volumes and Conditions

1. General

a. Field Investigation

Field investigations were conducted on November 9 and 10, 2004 and consisted of manual turning movement count surveys along Ala Moana Boulevard within the project vicinity. The manual turning movement count surveys were conducted between the morning peak hours of 5:30 AM and 8:30 AM and the afternoon peak hours of 3:30 PM and 6:30 PM at the following intersections:

- Ala Moana Boulevard and Punchbowl Street
- Ala Moana Boulevard, South Street, and Forrest Avenue
- Ala Moana Boulevard and Keawe Street
- Ala Moana Boulevard and Coral Street
- Ala Moana Boulevard and Ohe Street
- Ala Moana Boulevard and Koula Street
- Ala Moana Boulevard, Ward Avenue, and Ilalo Street

Appendix A includes the existing traffic count data.

b. Capacity Analysis Methodology

The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2000, and the "Highway Capacity Software", developed by the Federal Highway Administration. The analysis is based on the concept of Level of Service (LOS) to identify the traffic operational deficiencies associated with traffic demands during the peak hours of traffic.

LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F"; LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" unacceptable or potentially congested traffic operating conditions.

"Volume-to-Capacity" (v/c) ratio is another measure indicating the relative traffic demand to the road carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or near capacity. A v/c ratio of greater than 1.00 indicates that the traffic demand exceeds the road's carrying capacity. The LOS definitions are included in Appendix B.

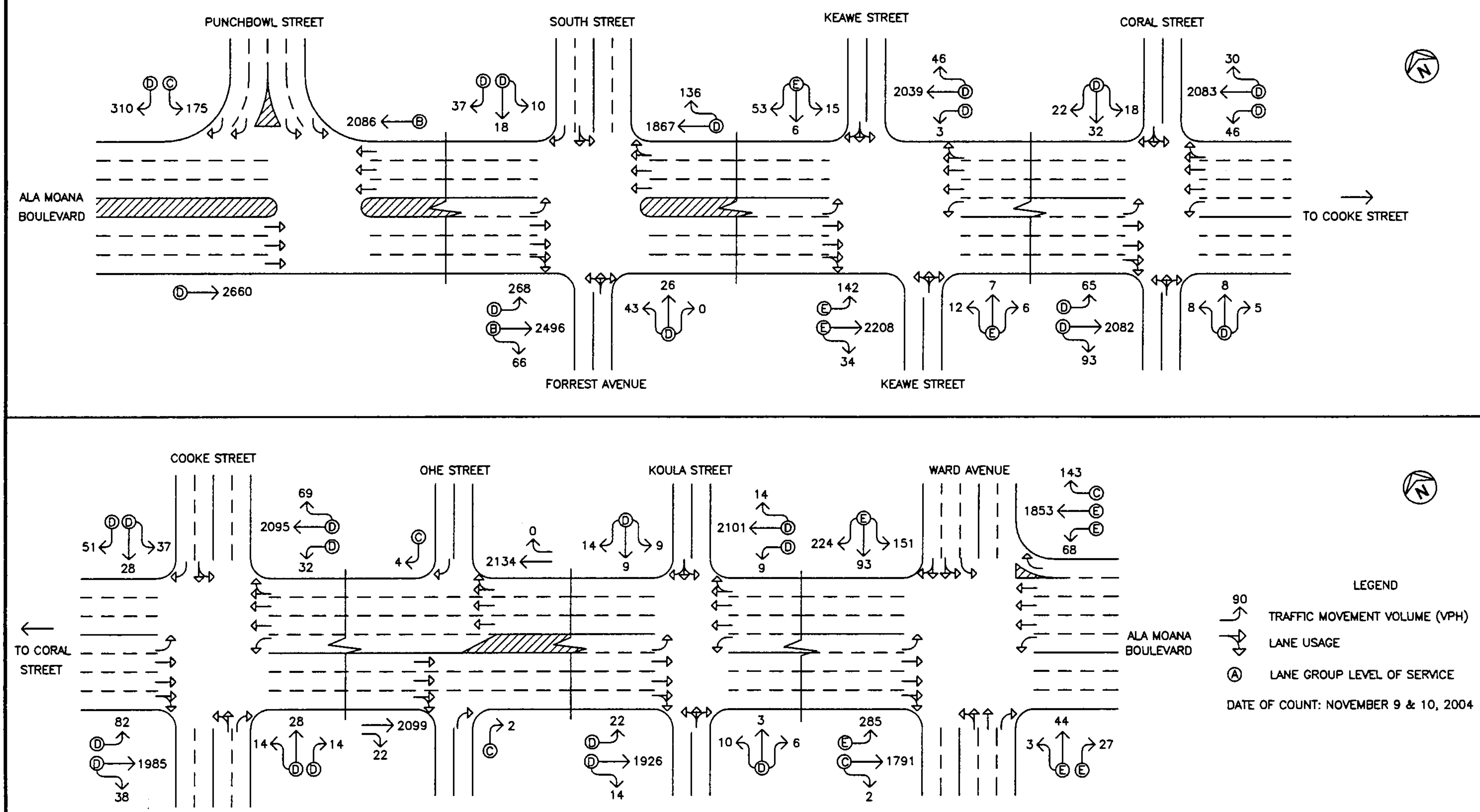
2. Existing Peak Hour Traffic

a. General

Figures 3 and 4 show the existing AM and PM peak hour traffic volumes and operating traffic conditions. The AM peak hour of traffic generally occurs between 7:15 AM and 8:15 AM in the vicinity of the proposed project. In the afternoon, the PM peak hour of traffic generally occurs between the hours of 4:15 PM and 5:15 PM. Although the peak hours of traffic generally occur around the same time periods at each of the study intersections, the absolute commuter peak hour time periods for each intersection may differ slightly as shown in Table 2.

Table 2: Peak Hours of Traffic

Intersection	AM Peak	PM Peak
Ala Moana Blvd/ Punchbowl St	7:15 AM – 8:15 AM	4:00 PM – 5:00 PM
Ala Moana Blvd/ South St/Forrest Ave	7:00 AM – 8:00 AM	4:30 PM – 5:30 PM
Ala Moana Blvd/ Keawe St	7:15 AM – 8:15 AM	4:15 PM – 5:15 PM
Ala Moana Blvd/ Coral St	7:15 AM – 8:15 AM	4:15 PM – 5:15 PM



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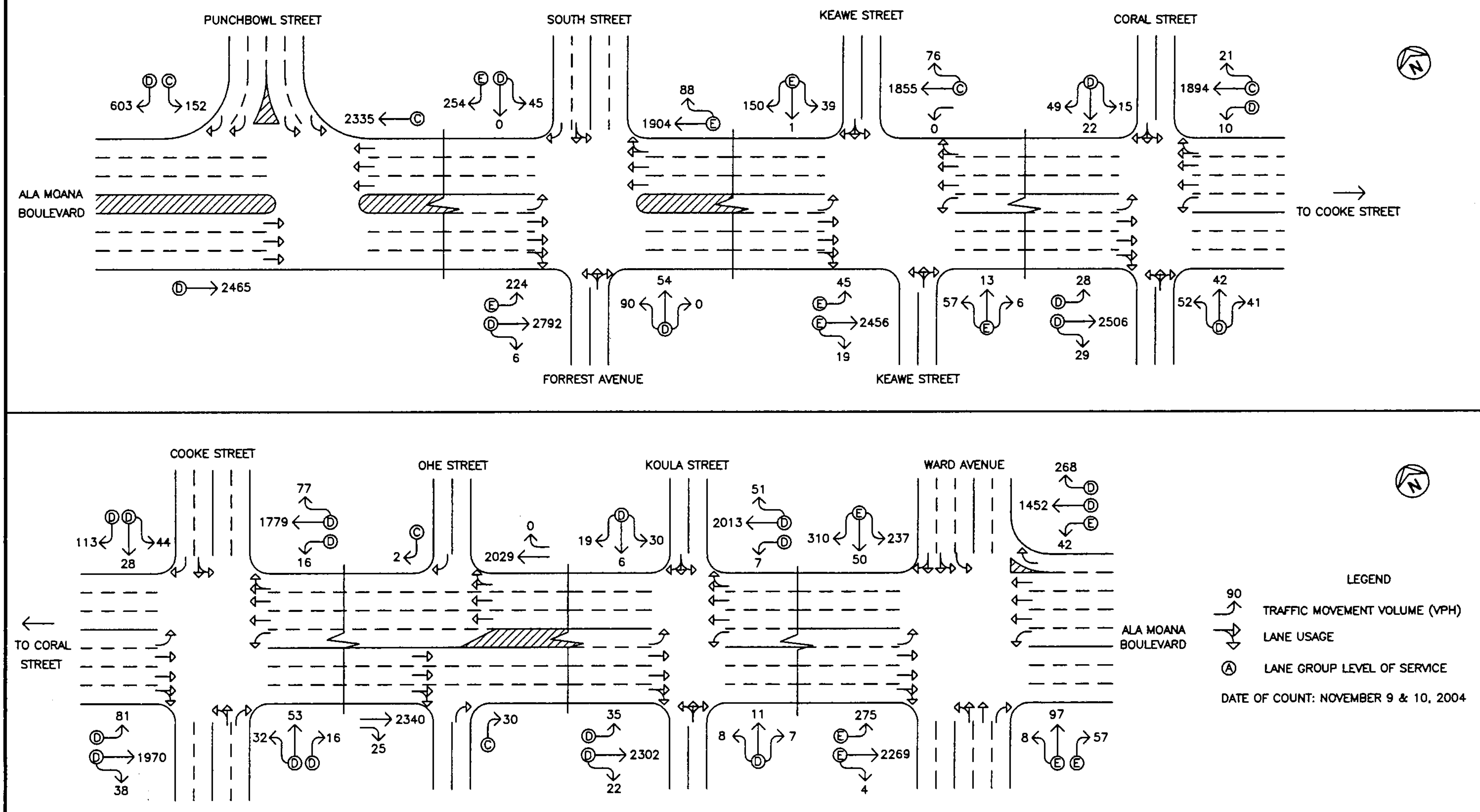
EXISTING AM PEAK HOUR OF TRAFFIC

FIGURE 3



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EXISTING PM PEAK HOUR OF TRAFFIC

FIGURE 4

Table 2: Peak Hours of Traffic (Cont'd)

Intersection	AM Peak	PM Peak
Ala Moana Blvd/ Ohe St	7:00 AM – 8:00 AM	3:30 PM – 4:30 PM
Ala Moana Blvd/ Koula St	7:00 AM – 8:00 AM	3:30 PM – 4:30 PM
Ala Moana Blvd/ Ward Ave/Ilalo St	7:30 AM – 8:30 AM	5:00 PM – 6:00 PM

The analysis is based on these absolute commuter peak hour time periods to assess the traffic operations. The LOS calculation worksheets are included in Appendix C.

b. Ala Moana Boulevard and Punchbowl Street

At the intersection with Punchbowl Street, Ala Moana Boulevard carries 2,660 vehicles eastbound and 2,086 vehicles westbound during the AM peak hour of traffic. The overall traffic volumes are approximately the same during the PM peak period with 2,465 vehicles traveling eastbound and 2,335 vehicles traveling westbound. The eastbound approach of Ala Moana Boulevard operates at LOS "D" during both peak periods while the westbound approach operates at LOS "B" and LOS "C" during the AM and PM peak periods, respectively.

The Punchbowl Street approach of this intersection carries 485 vehicles southbound during the AM peak hour of traffic. The traffic volume is significantly higher during the PM peak period with 755 vehicles traveling southbound. The southbound left-turn and right-turn traffic movements along Punchbowl Street operate at LOS "C" and LOS "D," respectively, during both peak periods.

Traffic operations at the intersection of Ala Moana Boulevard and Punchbowl Street are heavily influenced by vehicular queues along both roadways. During the AM peak period, average queue lengths of 12 vehicles and maximum queue lengths of 15 vehicles were observed on all approaches with queues along Punchbowl Street periodically extending through the upstream intersection with Pohukaina Street. Most of these queues would clear the intersection after each traffic signal cycle change, but occasionally vehicles had to wait for more than one traffic signal cycle length. During the PM peak period, queues from downstream intersections in both the eastbound and westbound directions consistently extended through the Ala Moana Boulevard and Punchbowl Street intersection. Vehicles on the eastbound and westbound approaches of Ala Moana Boulevard had to wait for more than one traffic signal cycle length to clear the intersection. Vehicular queues along Punchbowl Street were shorter with average queue lengths of 10 vehicles and maximum queue lengths of 12 vehicles observed during the PM peak period. However, due to the queuing along Ala Moana Boulevard, many of the vehicles on the Punchbowl Street approach of the intersection had to wait for more than one traffic signal cycle length to clear the intersection.

c. Ala Moana Boulevard, South Street, and Forrest Avenue

At the intersection with South Street and Forrest Avenue, Ala Moana Boulevard carries 2,830 vehicles eastbound and 2,003 vehicles westbound during the AM peak hour of traffic. The overall traffic volumes are slightly higher during the PM peak period with 3,022 vehicles traveling eastbound and 1,992 vehicles traveling westbound. The eastbound left-turn and the westbound through and right-turn traffic movements along Ala Moana Boulevard operate at LOS "D" and LOS "E" during the AM and PM peak periods, respectively, while the eastbound through and right-turn traffic movement operates at LOS "B" and LOS "D" during the AM and PM peak periods, respectively.

The South Street approach of this intersection carries 65 vehicles southbound during the AM peak hour of traffic. The traffic volume is significantly higher during the PM peak period with 299 vehicles traveling southbound. The southbound left-turn and through traffic movement along South Street operates at LOS "D" during both peak periods while the southbound right-turn traffic movement which operates at LOS "D" and LOS "E" during the AM and PM peak periods, respectively.

The northbound approach of this intersection is comprised of Forrest Avenue which carries 69 vehicles northbound during the AM peak period. The traffic volume is slightly higher during the PM peak period with 144 vehicles traveling northbound. The Forrest Avenue approach operates at LOS "D" during both peak periods of traffic.

Traffic operations at the intersection of Ala Moana Boulevard, South Street, and Forrest Avenue are also heavily influenced by vehicular queues along Ala Moana Boulevard. During the AM peak period, traffic queues averaging approximately 5 vehicles in length would intermittently form on both approaches of Ala Moana Boulevard, but these queues would clear the intersection after each traffic signal cycle change. During the PM peak period, queues from downstream intersections in both the eastbound and westbound directions periodically extended through the intersection with South Street and Forrest Avenue. Vehicles on the eastbound and westbound approaches of Ala Moana Boulevard often had to wait for more than one traffic signal cycle length to clear the intersection.

d. Ala Moana Boulevard and Keawe Street

At the intersection with Keawe Street, Ala Moana Boulevard carries 2,384 vehicles eastbound and 2,088 vehicles westbound during the AM peak hour of traffic. The overall traffic volumes are approximately the same during the PM peak period with 2,520 vehicles traveling eastbound and 1,931 vehicles traveling westbound. The eastbound traffic movements along Ala Moana Boulevard operate at LOS "E" during both peak periods while the westbound left-turn traffic movement operates at LOS "D" and LOS "E" during the AM and PM peak periods, respectively. In addition, the westbound through and right-turn traffic movement operates at LOS "D" and LOS "C" during the AM and PM peak periods, respectively.

The Keawe Street approaches of this intersection carry 25 vehicles northbound and 74 vehicles southbound during the AM peak hour of traffic. The traffic volumes are higher during the PM peak period with 76 vehicles traveling northbound and 190 vehicles traveling southbound. Both approaches of Keawe Street operate at LOS "E" during both peak periods.

Similar to the Ala Moana Boulevard, South Street, and Forrest Avenue intersection, traffic queues averaging approximately 5 vehicles in length would intermittently form on both approaches of Ala Moana Boulevard during the AM peak period, but these queues would clear the intersection after each traffic signal cycle change. During the PM peak period, queues from downstream intersections in both the eastbound and westbound directions periodically extended through the intersection with Keawe Street. Vehicles on the eastbound and westbound approaches of Ala Moana Boulevard often had to wait for more than one traffic signal cycle length to clear the intersection.

e. Ala Moana Boulevard and Coral Street

At the intersection with Coral Street, Ala Moana Boulevard carries 2,240 vehicles eastbound and 2,159 vehicles westbound during the AM peak hour of traffic. The overall traffic volumes are approximately the same during the PM peak period with 2,563 vehicles traveling eastbound and 1,925 vehicles traveling westbound. The eastbound traffic movements and the westbound left-turn traffic movement along Ala Moana Boulevard operate at LOS "D" during both peak periods while the westbound through and right-turn traffic movement operates at LOS "D" and LOS "C" during the AM and PM peak periods, respectively.

The Coral Street approaches of this intersection carry 21 vehicles northbound and 72 vehicles southbound during the AM peak hour of traffic. The traffic volumes are higher during the PM peak period with 135 vehicles traveling northbound and 86 vehicles traveling southbound. Both approaches of Coral Street operate at LOS "D" during both peak periods.

Similar to the intersections with South Street and Keawe Street, traffic operations at the intersection of Ala Moana Boulevard and Coral Street are heavily influenced by vehicular queues along Ala Moana Boulevard. During the AM peak period, traffic queues averaging approximately 5 vehicles in length would intermittently form on both approaches of Ala Moana Boulevard, but these queues would clear the intersection after each traffic signal cycle change. During the PM peak period, queues from downstream intersections in both the eastbound and westbound directions periodically extended through the intersection with Coral Street. Vehicles on the eastbound and westbound approaches of Ala Moana Boulevard often had to wait for more than one traffic signal cycle length to clear the intersection.

f. Ala Moana Boulevard and Cooke Street

At the intersection with Cooke Street, Ala Moana Boulevard carries 2,105 vehicles eastbound and 2,196 vehicles westbound during the AM peak hour of traffic. The traffic volumes are slightly less during the PM peak period with 2,089 vehicles traveling eastbound and 1,872 vehicles traveling westbound. All of the traffic movements along the eastbound and westbound approaches of Ala Moana Boulevard operate at LOS "D" during both peak periods.

The Cooke Street approaches of this intersection carry 56 vehicles northbound and 116 vehicles southbound during the AM peak hour of traffic. The traffic volumes are higher during the PM peak period with 101 vehicles traveling northbound and 185 vehicles traveling southbound. All of the traffic movements along the northbound and southbound approaches of Cooke Street operate at LOS “D” during both peak periods.

Similar to other study intersections along Ala Moana Boulevard, traffic operations at the intersection of Ala Moana Boulevard and Cooke Street are heavily influenced by vehicular queues along that roadway. During the AM peak period, traffic queues averaging approximately 5 vehicles in length would intermittently form on both approaches of Ala Moana Boulevard, but these queues would clear the intersection after each traffic signal cycle change. During the PM peak period, queues from downstream intersections in both the eastbound and westbound directions periodically extended through the intersection with Cooke Street. Vehicles on the eastbound and westbound approaches of Ala Moana Boulevard often had to wait for more than one traffic signal cycle length to clear the intersection.

g. Ala Moana Boulevard and Ohe Street

At the intersection with Ohe Street, Ala Moana Boulevard carries 2,121 vehicles eastbound and 2,134 vehicles westbound during the AM peak hour of traffic. The traffic volumes are approximately the same during the PM peak period with 2,365 vehicles traveling eastbound and 2,029 vehicles traveling westbound. Eastbound and westbound traffic along Ala Moana Boulevard is allowed to flow freely through the intersection and, as such, vehicular queues were only observed during the PM peak period when queues from downstream intersections in both directions periodically extended through the intersection with Ohe Street.

The Ohe Street approaches of this intersection carry 2 vehicles northbound and 4 vehicles southbound during the AM peak hour of traffic. The traffic volumes are higher during the PM peak period with 30 vehicles traveling northbound and 2 vehicles traveling southbound. Both approaches of Ohe Street operate at LOS "C" during both peak periods of traffic.

h. Ala Moana Boulevard and Koula Street

At the intersection with Koula Street, Ala Moana Boulevard carries 1,962 vehicles eastbound and 2,124 vehicles westbound during the AM peak hour of traffic. The traffic volumes are slightly higher during the PM peak period with 2,359 vehicles traveling eastbound and 2,071 vehicles traveling westbound. All of the traffic movements along the eastbound and westbound approaches of Ala Moana Boulevard operate at LOS "D" during both peak periods.

The Koula Street approaches of this intersection carry 19 vehicles northbound and 32 vehicles southbound during the AM peak hour of traffic. The traffic volumes are slightly higher during the PM peak period with 26 vehicles traveling northbound and 55 vehicles traveling southbound. Both approaches of Koula Street operate at LOS "D" during both peak periods of traffic.

Vehicular queuing along Ala Moana Boulevard heavily influence the traffic operations at the intersection of Ala Moana Boulevard and Koula Street as with other study intersections along that roadway. During the AM peak period, traffic queues averaging approximately 5 vehicles in length would intermittently form on both approaches of Ala Moana Boulevard, but these queues would clear the intersection after each traffic signal cycle change. During the PM peak period, queues from downstream intersections in both the eastbound and westbound directions periodically extended through the intersection with Koula Street. Vehicles on the eastbound and westbound approaches of Ala Moana Boulevard often had to wait for more than one traffic signal cycle length to clear the intersection.

i. Ala Moana Boulevard, Ward Ave, and Ilalo Street

At the intersection with Ward Avenue, Ala Moana Boulevard carries 2,078 vehicles eastbound and 2,064 vehicles westbound during the AM peak hour of traffic. The overall traffic volumes are slightly higher during the PM peak period with 2,548 vehicles traveling eastbound and 1,762 vehicles traveling westbound. The eastbound and westbound left-turn traffic movements along Ala Moana Boulevard operate at LOS "E" during both peak periods while the eastbound through and right-turn traffic movement which operates at LOS "C" and LOS "E" during the AM and PM peak periods, respectively. In addition, the westbound through and right-turn traffic movements operate at LOS "E" and LOS "C," respectively, during the AM peak period and LOS "D" during the PM peak period.

The Ward Avenue approach of this intersection carries 468 vehicles southbound during the AM peak hour of traffic. The traffic volume is higher during the PM peak period with 597 vehicles traveling southbound. The Ward Avenue approach of this intersection operates at LOS "E" during both peak periods.

The northbound approach of this intersection is comprised of Ilalo Street which carries 74 vehicles northbound during the AM peak hour of traffic. The traffic volume is higher during the PM peak period with 162 vehicles traveling northbound. All of the traffic movements on the Ilalo Street approach operate at LOS "E" during both peak periods.

Vehicular queuing at this intersection is not as severe as at the other study intersections along Ala Moana Boulevard. During the AM peak period, average queue lengths of 8 vehicles and maximum queue lengths of 10 vehicles were observed on the Ala Moana Boulevard and Ilalo Street approaches while average queue lengths of 2 vehicles and maximum queue lengths of 5 vehicles observed on the Ward Avenue approach of the intersection. The queues along all of the approaches of the intersection would clear the intersection after each traffic signal cycle change. During the PM peak period, average queue lengths of 5 vehicles and maximum queue lengths of 7 vehicles were observed on the Ward Avenue and Ilalo Street approaches of the intersection. Most of these queues would clear the intersection after each traffic signal cycle change, but occasionally vehicles had to wait for more than one traffic signal cycle length to clear the intersection. Along Ala Moana Boulevard, average queue lengths of 10 vehicles were observed on the westbound approach while queues on the eastbound approach periodically extended through upstream intersections. Most queues on the westbound approach of the intersection would clear the intersection after each traffic signal cycle change, but vehicles on the eastbound approach of Ala Moana Boulevard often had to wait for more than one traffic signal cycle length to clear the intersection.

IV. YEAR 2009 PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 7th Edition," 2003. The ITE trip generation rates are developed empirically by correlating the vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per 1,000 square feet of development or dwelling unit. Some of the lots have existing uses that will be replaced by the proposed new developments. As such, the trips generated by these existing uses were removed from the existing roadway network and replaced by the trips associated with the proposed developments. Tables 3 and 4 summarize the trip generation characteristics applied to the AM and PM peak hours of traffic.

Table 3: Year 2009 Peak Hour Trip Generation (Existing Uses)

Lot No.	Peak Period	Projected Trip Ends	
8	AM Peak	Enter	(65)
		Exit	(23)
		Total	(88)
	PM Peak	Enter	(41)
		Exit	(63)
		Total	(104)

Table 4: Year 2009 Peak Hour Trip Generation (Proposed Developments)

Lot No.	Peak Period	Projected Trip Ends	
7B	AM Peak	Enter	352
		Exit	48
		Total	400
	PM Peak	Enter	63
		Exit	305
		Total	368
8	AM Peak	Enter	478
		Exit	65
		Total	543
	PM Peak	Enter	85
		Exit	416
		Total	501
13	AM Peak	Enter	422
		Exit	58
		Total	480
	PM Peak	Enter	75
		Exit	366
		Total	441
15/16*	AM Peak	Enter	610
		Exit	115
		Total	725
	PM Peak	Enter	160
		Exit	605
		Total	765

*Per "Traffic Impact Analysis Report for the University of Hawaii Health and Wellness Center" dated May 2002.

2. Trip Distribution

Vehicular access to the proposed developments on lots 7B and 8 were assumed to be located along the adjacent north-south oriented connector streets. As such, access for Lot 7B was assumed to be provided off of Coral Street while access for Lot 8 was assumed to be provided off of Cooke Street. Access for Lot 13 was assumed to be off of a new access road connected to the Keawe Street and Ilalo Street intersection along the west edge of the property. The distribution of traffic for these three lots from their access points and at the study intersections was based upon the assumed direction of travel given the existing distribution of population and activity centers on the island. As such, 72% of the trips were assumed to be traveling to and from the west, 7% were assumed to be traveling to and from the north, and 21% were assumed to be traveling to and from the east.

Lots 15 and 16 are expected to house the new John A. Burns School of Medicine and the Cancer Research Center of Hawaii. The vehicular access points for these lots, as well as, the distribution of traffic from these points is assumed to be as described in "Traffic Impact Analysis Report for the University of Hawaii Health and Wellness Center" dated May 2002.

B. Through-Traffic Forecasting Methodology

The travel forecast is based upon the average annual traffic growth rate derived from data provided by the Oahu Metropolitan Planning Organization's regional travel demand forecasting model as described in the "Traffic Analysis for The Kakaako Makai Area Plan" prepared by Kaku Associates for the HCDA in March 1998. As such, the average daily traffic in the project vicinity is anticipated to increase at an average rate of 0.5% per year. Using 2004 as the Base Year, a growth factor of 1.025 was applied to the AM and PM existing traffic demands to achieve the projected Year 2009 traffic demands.

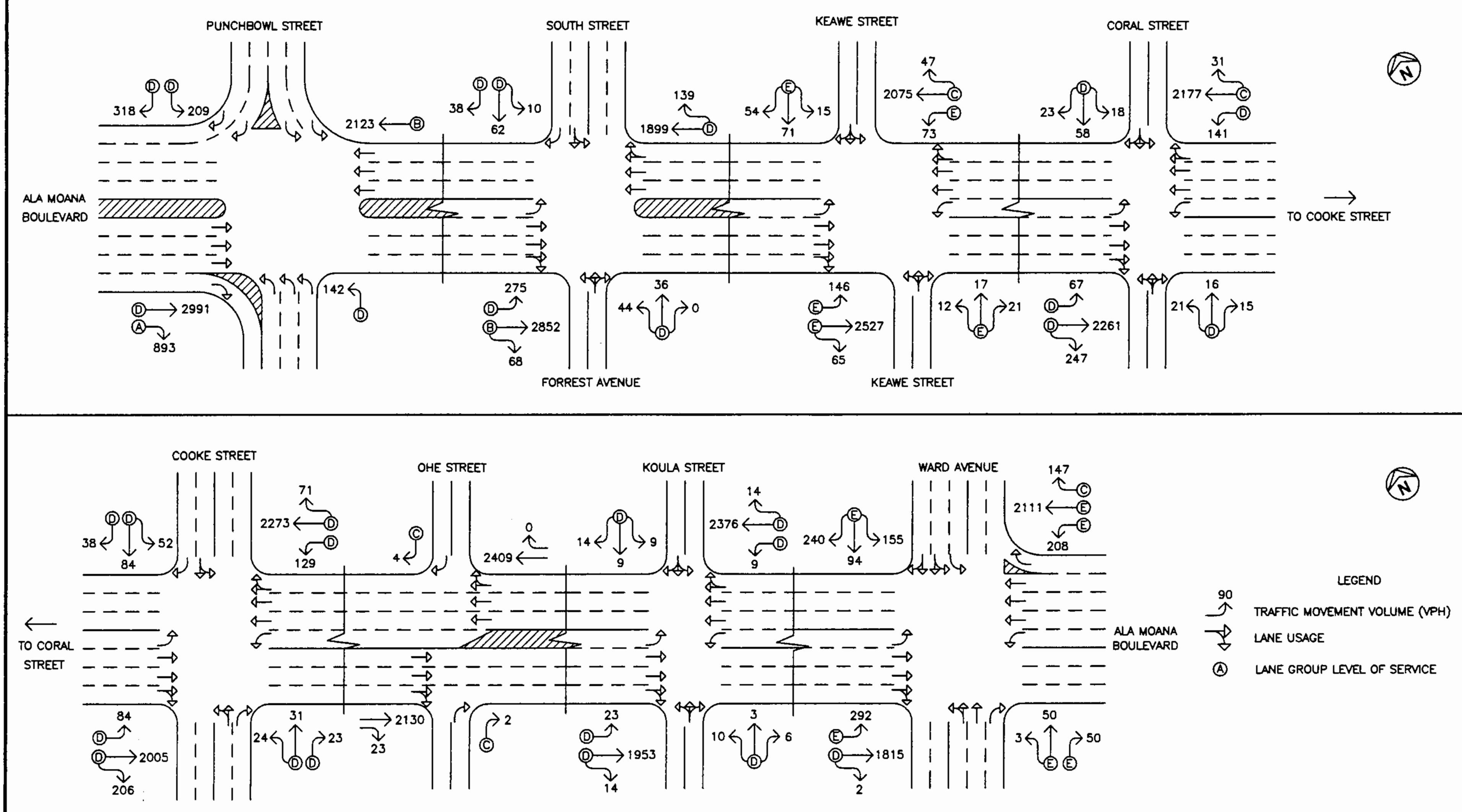
C. Traffic Assessment

The cumulative Year 2009 projected AM and PM peak hour traffic conditions along Ala Moana Boulevard and Ilalo Street with the development of Lots 7B, 8, 13, 15, and 16 in the Kakaako Makai Area are shown in Figures 5 to 8 and summarized in Tables 5 and 6. The cumulative volumes consist of site-generated traffic superimposed over projected Year 2009 traffic demands. Although, the extension of

Punchbowl Street between Ala Moana Boulevard to Ilalo Street is expected to be completed with or without the development of the Makai Area, additional modifications to the Ala Moana Boulevard and Punchbowl Street intersection, as well as, along Ilalo Street may be required if the proposed development of the Makai Area is undertaken. Due to the anticipated increases in traffic in the project vicinity, all approaches of the intersection of Ala Moana Boulevard with Punchbowl Street are expected to operate at LOS "F" during both peak periods except for the westbound approach during the AM peak period without the implementation of these modifications. In addition, the eastbound approaches of the intersections of Ilalo Street with Forrest Avenue and Keawe Street are anticipated to operate at LOS "F" during the AM peak periods while the westbound approach of the Forrest Avenue intersection and the northbound approach of the Keawe Street intersection are anticipated to operate at LOS "F" and LOS "E," respectively, during the PM peak period. As such, for the purpose of this report, the Ala Moana Boulevard and Punchbowl Street intersection is assumed to be modified by the Year 2009 to accommodate the new extension and projected increases in traffic. In addition, the roadway and intersections along Ilalo Street are assumed to be modified to accommodate projected increases in traffic. The existing traffic operating conditions along Ala Moana Boulevard are provided in Table 5 for comparison purposes. LOS calculations are included in Appendix D.

Table 5: Existing and Projected Year 2009 Traffic Operating Conditions
Ala Moana Boulevard

Intersecting Street	Traffic Movement		AM			PM		
			Exist	Year 2009		Exist	Year 2009	
				w/out Imp	w/ Imp		w/out Imp	w/ Imp
Punchbowl St	Eastbound	TH	D	F	D	D	F	D
		RT	-		A	-		B
	Westbound	TH-RT	B	A	B	C	F	D
	Northbound	LT	-	F	D	-	F	D



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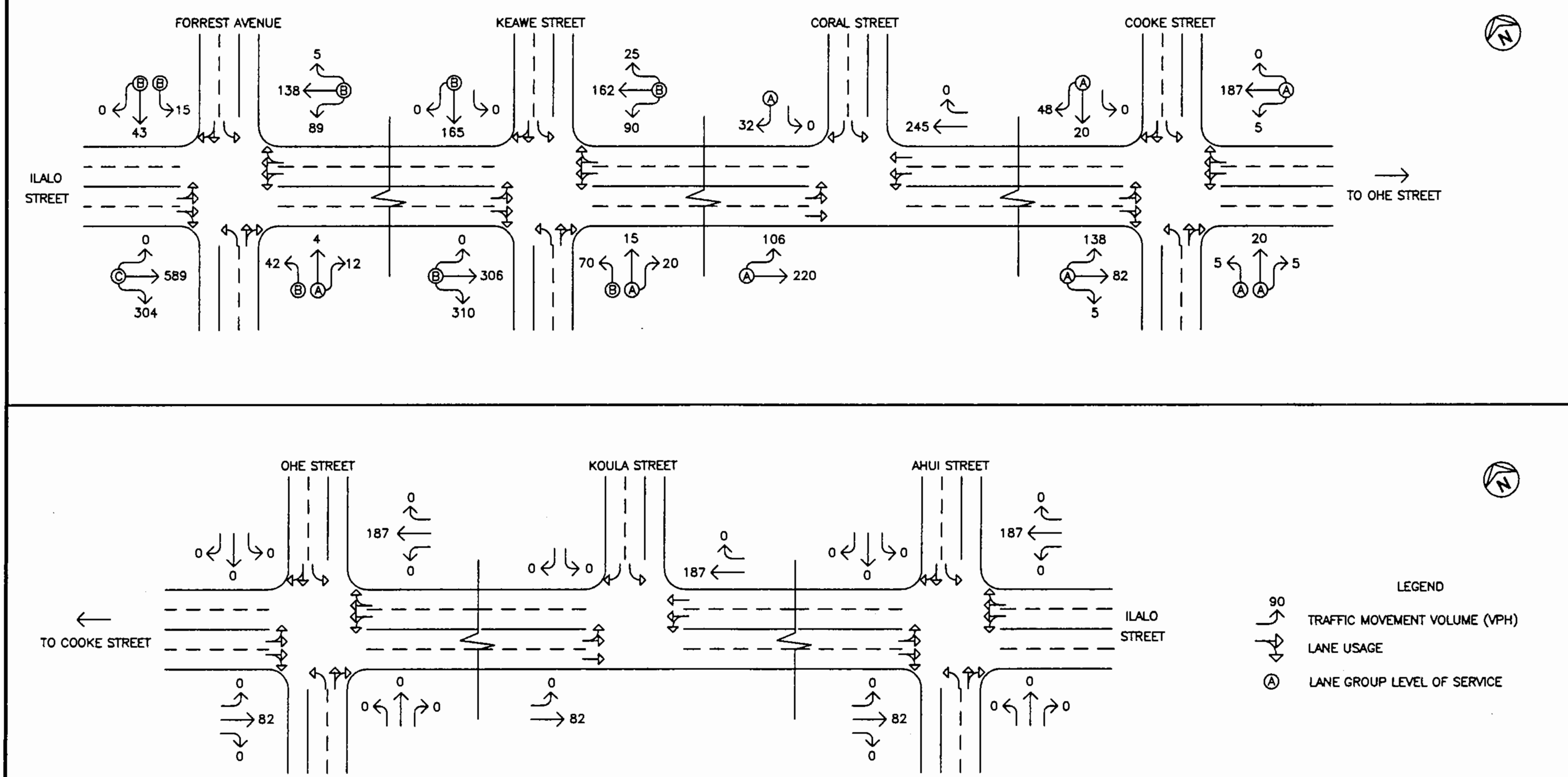
YEAR 2009 AM PEAK HOUR OF TRAFFIC WITH PROJECT
ALA MOANA BOULEVARD

FIGURE
5



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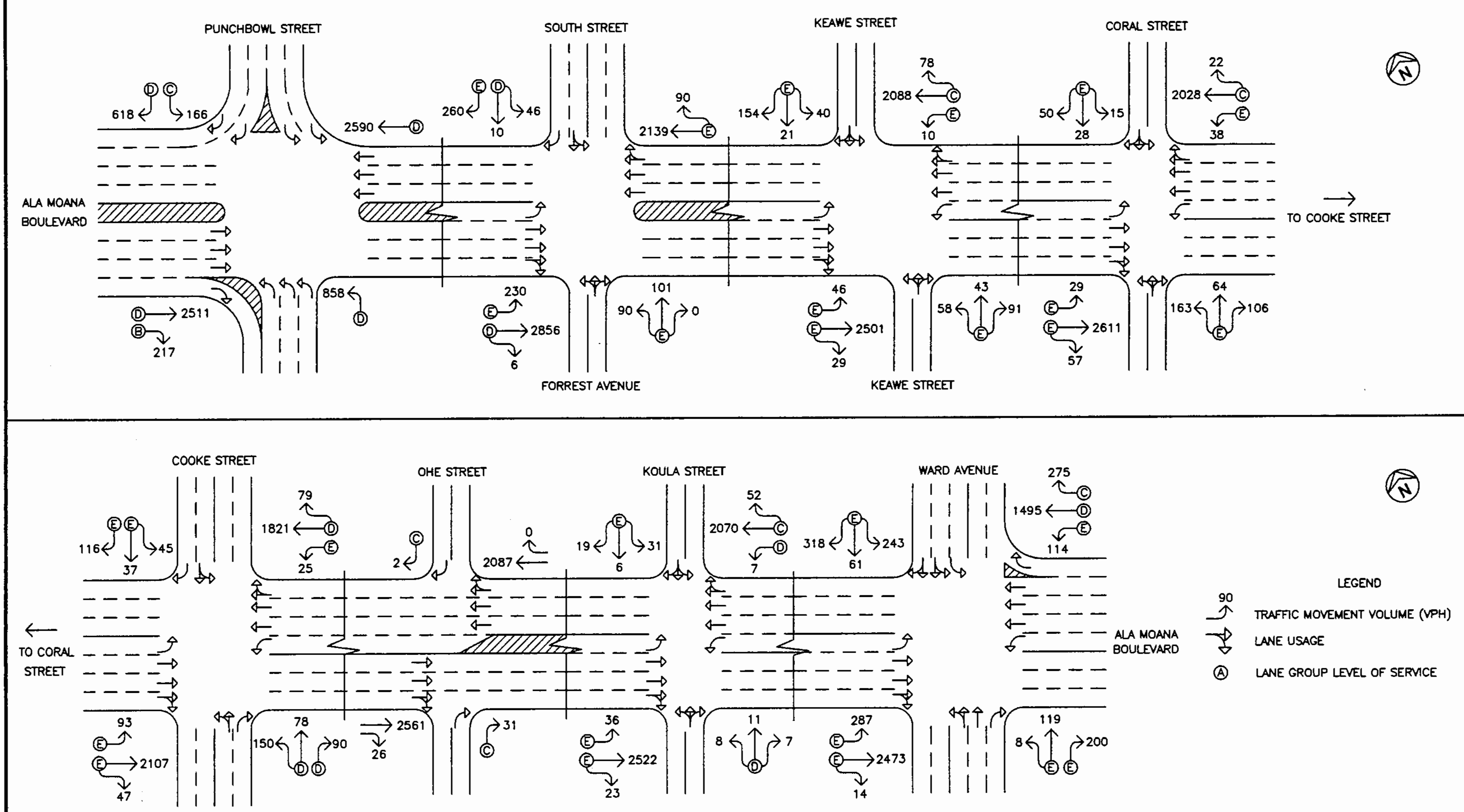
YEAR 2009 AM PEAK HOUR OF TRAFFIC WITH PROJECT
ILALO STREET

FIGURE 6



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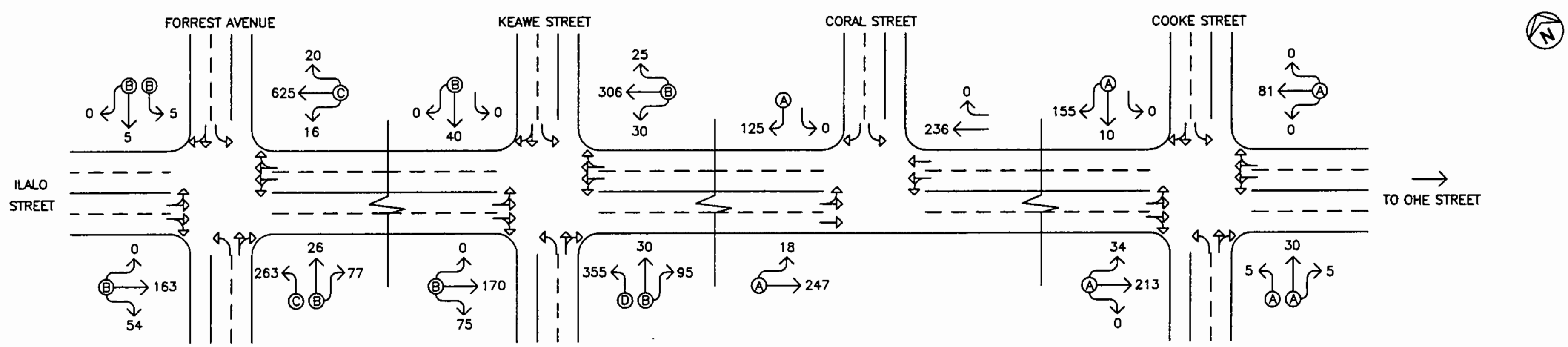
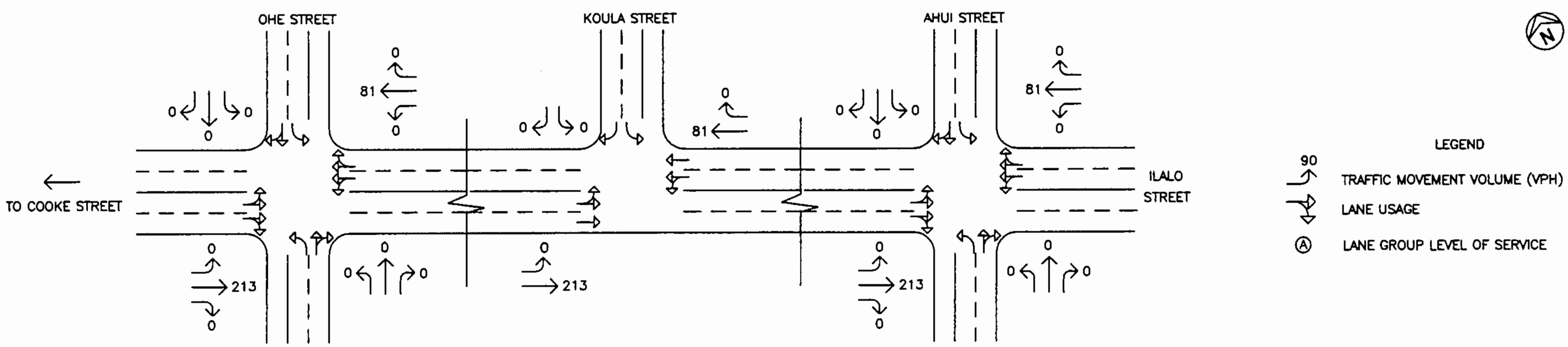
YEAR 2009 PM PEAK HOUR OF TRAFFIC WITH PROJECT ALA MOANA BOULEVARD

FIGURE 7





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YEAR 2009 PM PEAK HOUR OF TRAFFIC WITH PROJECT
ILALO STREET

FIGURE
8

Table 5: Existing and Projected Year 2009 Traffic Operating Conditions Ala Moana Boulevard (Cont'd)

Intersecting Street	Traffic Movement		AM			PM		
			Exist	Year 2009		Exist	Year 2009	
				w/out Imp	w/ Imp		w/out Imp	w/ Imp
Punchbowl St (Cont'd)	Southbound	LT	C	E	D	C	D	C
		RT	D	F	D	D	F	D
South St/Forrest Ave	Eastbound	LT	D	D	D	E	E	E
		TH-RT	B	B	B	D	D	D
	Westbound	TH-RT	D	D	D	E	E	E
	Northbound	LT-TH-RT	D	D	D	D	E	E
	Southbound	LT-TH	D	D	D	D	D	D
		RT	D	D	D	E	E	E
Keawe St	Eastbound	LT	E	E	E	E	E	E
		TR-RT	E	E	E	E	E	E
	Westbound	LT	D	E	E	E	E	E
		TH-RT	D	C	C	C	C	C
	Northbound	LT-TH-RT	E	E	E	E	E	E
	Southbound	LT-TH-RT	E	E	E	E	E	E
Coral St	Eastbound	LT	D	D	D	D	E	E
		TH-RT	D	D	D	D	E	E
	Westbound	LT	D	D	D	D	E	E
		TH-RT	D	C	C	C	C	C
	Northbound	LT-TH-RT	D	D	D	D	E	E
	Southbound	LT-TH-RT	D	D	D	D	E	E
Cooke St	Eastbound	LT	D	D	D	D	E	E
		TH-RT	D	D	D	D	E	E
	Westbound	LT	D	D	D	D	E	E
		TH-RT	D	D	D	D	D	D
	Northbound	LT-TH	D	D	D	D	D	D
		RT	D	D	D	D	D	D

Table 5: Existing and Projected Year 2009 Traffic Operating Conditions Ala Moana Boulevard (Cont'd)

Intersecting Street	Traffic Movement		AM			PM		
			Exist	Year 2009		Exist	Year 2009	
				w/out Imp	w/ Imp		w/out Imp	w/ Imp
Cooke St (Cont'd)	Southbound	LT-TH	D	D	D	D	E	E
		RT	D	D	D	D	E	E
Ohe St	Northbound	RT	C	C	C	C	C	C
	Southbound	RT	C	C	C	C	C	C
Koula St	Eastbound	LT	D	D	D	D	E	E
		TH-RT	D	D	D	D	E	E
	Westbound	LT	D	D	D	D	D	D
		TH-RT	D	D	D	D	C	C
	Northbound	LT-TH-RT	D	D	D	D	D	D
	Southbound	LT-TH-RT	D	D	D	D	E	E
Ward Ave	Eastbound	LT	E	E	E	E	E	E
		TH-RT	C	D	D	E	E	E
	Westbound	LT	E	E	E	E	E	E
		TH	E	E	E	D	D	D
		RT	C	C	C	D	C	C
	Northbound	LT-TH	E	E	E	E	E	E
		RT	E	E	E	E	E	E
	Southbound	LT-TH-RT	E	E	E	E	E	E

Table 6: Projected Year 2009 Traffic Operating Conditions Ilalo Street

Intersecting Street	Traffic Movement		AM		PM	
			w/out Imp	w/ Imp	w/out Imp	w/ Imp
Forrest Ave	Eastbound	LT-TH-RT	F	C	B	B
	Westbound	LT-TH-RT	B	B	F	C

Table 6: Projected Year 2009 Traffic Operating Conditions
Ilalo Street (Cont'd)

Intersecting Street	Traffic Movement		AM		PM	
			w/out Imp	w/ Imp	w/out Imp	w/ Imp
Forrest Ave (Cont'd)	Northbound	LT	B	B	C	C
		TH-RT		A		B
	Southbound	LT	B	B	B	B
		TH-RT		B		B
Keawe St	Eastbound	LT-TH-RT	F	B	B	B
	Westbound	LT-TH-RT	B	B	C	B
	Northbound	LT	B	B	E	D
		TH-RT		A		B
	Southbound	LT	B	A	B	A
		TH-RT		B		B
Coral St	Eastbound	LT-TH	B	A	B	A
	Westbound	TH-RT	A	-	A	-
	Southbound	LT	A	B	A	B
		RT		A		A
Cooke St	Eastbound	LT-TH-RT	A	A	A	A
	Westbound	LT-TH-RT	A	A	A	A
	Northbound	LT	A	A	A	A
		TH-RT		A		A
	Southbound	LT	A	A	A	A
		TH-RT		A		A

At the study intersections along Ala Moana Boulevard, traffic operations are expected, in general, to deteriorate from existing conditions due to the anticipated increases in traffic due to ambient traffic growth and development of portions of the Kakaako Makai Area. During the AM peak period, the traffic movements at the intersections with Punchbowl Street, South Street/Forrest Avenue, Coral Street, Cooke Street, and Koula Street are anticipated to remain operating at LOS "D" or better while the northbound and southbound traffic movements at the intersection with Ohe Street are anticipated to remain operating at LOS "C". Similarly, the traffic movements at the intersections with Keawe Street and Ward Avenue are expected to continue operating at LOS "E" or better during the AM peak period. Traffic conditions during the PM peak period are worse with the levels of service for many of the traffic movements at the intersections with South Street/Forrest Avenue, Coral Street, Cook Street, and Koula Street deteriorating from LOS "D" to LOS "E." In addition, the traffic movements at the intersection with Punchbowl Street are anticipated to operate at LOS "D" or better while those at the intersections with Keawe Street and Ward Avenue are anticipated to continue operating at LOS "E" or better during the PM peak period.

At the intersections along Ilalo Street, traffic operations are anticipated to operate at adequate levels of service despite the significant increase in traffic volumes due to the development of Lots 7B, 8, 13, 15, and 16. The traffic movements at the intersections with Coral Street and Cooke Street are anticipated to operate at LOS "B" or better during both peak periods while those at the intersection with Forrest Avenue are anticipated to operate at LOS "C" or better during both peak periods. At the intersection with Keawe Street, traffic operations are anticipated to operate well at LOS "B" or better during both peak periods with the exception of the northbound left-turn traffic movement which operates at LOS "D" during the PM peak period due to the high volume of traffic exiting Lots 15 and 16.

D. Recommendations for Year 2009

Based on the analysis of the traffic data and the preliminary development schedule, the following are the recommendations of this study for the Year 2009:

1. Maintain adequate turning radii at all roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.

2. Maintain adequate sight distances for motorists to safely enter and exit all roadways.

3. Extend Punchbowl Street from Ala Moana Boulevard to Ilalo Street. At the intersection with Ala Moana Boulevard, provide three northbound left-turn lanes.

4. Modify Ala Moana Boulevard west of the intersection with Punchbowl Street intersection to provide an exclusive right-turn lane for vehicles turning right onto the new Punchbowl Street extension, as well as, an additional westbound departure lane from the intersection (see Figure 9). The additional departure lane will provide a free right-turn movement for the outer southbound right-turn lane along Punchbowl Street.

5. Restrict pedestrian crossing on the west side of the Ala Moana Boulevard and Punchbowl Street intersection. Crossings will be allowed across the east, north, and south sides of the intersection.

6. Modify the traffic signal timing and phasing at the Ala Moana Boulevard and Punchbowl Street intersection to accommodate a four-way intersection.

7. Provide two lanes of traffic in each direction along Ilalo Street with shared through and turning lanes provided at each intersection along its length (see Figure 10).

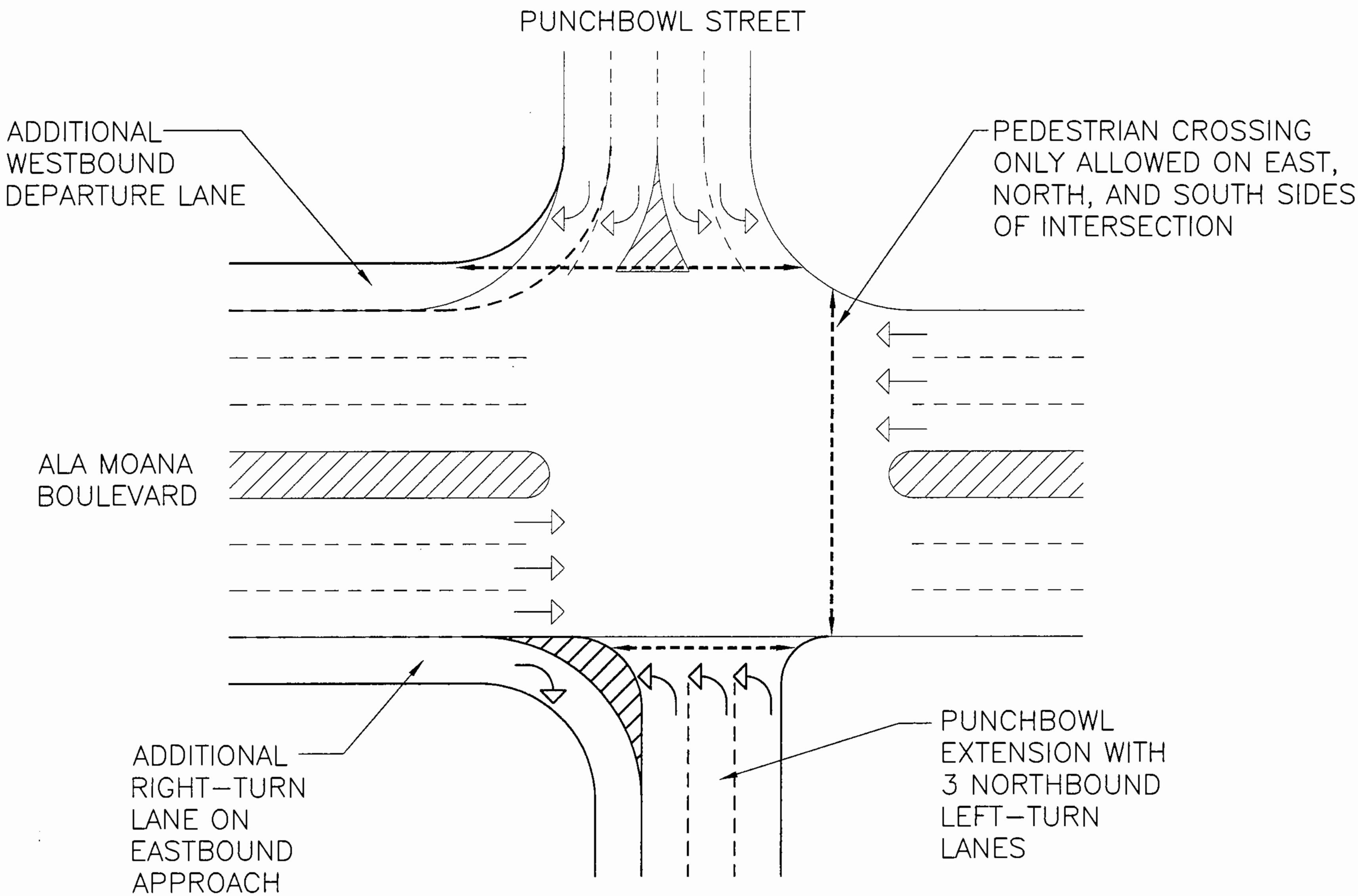
8. Restrict access along Ilalo Street from adjacent parcels. Access points for adjacent parcels should be located along intersecting streets.

9. Prohibit parking along Ilalo Street.

10. Provide exclusive left-turn lanes on the northbound and southbound approaches at the intersections along Ilalo Street (see Figure 10).

11. Provide all-way stop intersection control at the following intersections along Ilalo Street (see Figure 10):
    - Forrest Avenue
    - Keawe Street
    - Cooke Street
    - Ahui Street

12. Provide two-way stop intersection control at the following intersections along Ilalo Street (see Figure 10):
    - Coral Street
    - Ohe Street
    - Koula Street



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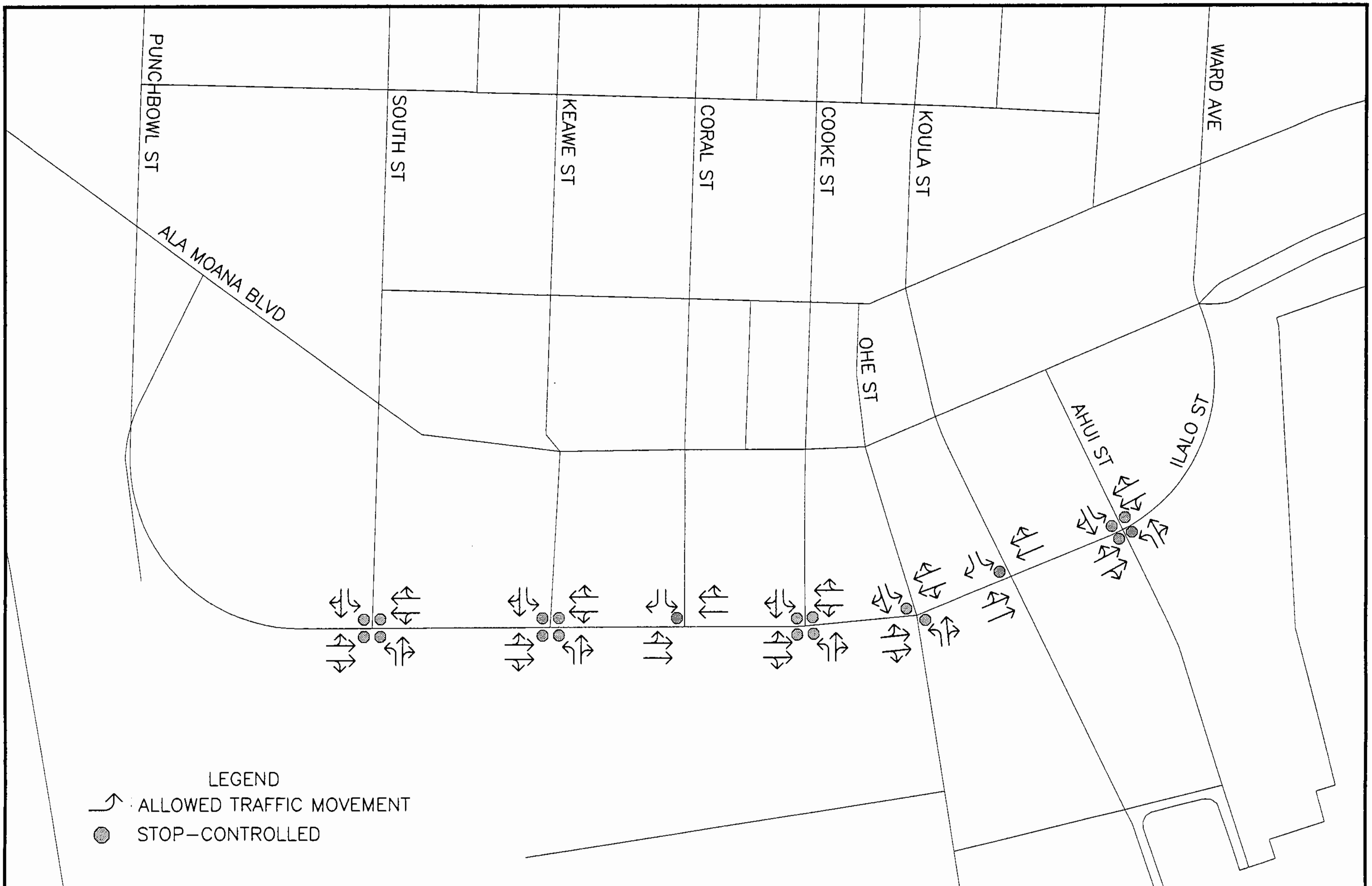
KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

YEAR 2009 RECOMMENDED IMPROVEMENTS SCHEMATIC LAYOUT
PUNCHBOWL ST AND ALA MOANA BLVD

FIGURE 9



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KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

YEAR 2009 RECOMMENDED IMPROVEMENTS SCHEMATIC LAYOUT
ILALO STREET

FIGURE
10

V. YEAR 2014 PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 7th Edition," 2003. The ITE trip generation rates are developed empirically by correlating the vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per 1,000 square feet of development or dwelling unit. Some of the lots have existing uses that will be replaced by the proposed new developments. As such, the trips generated by these existing uses were removed from the existing roadway network and replaced by the trips associated with the proposed developments. Since the Kakaako Makai Area is envisioned to be a walkable, mixed-use community where people can live, work, shop, and play, for the purpose of this report, 20% of the trips generated by the proposed residential developments during both peak periods were assumed to be walking trips. Tables 3 and 4 summarize the trip generation characteristics applied to the AM and PM peak hours of traffic. Tables 7 and 8 summarize the trip generation characteristics applied to the AM and PM peak hours of traffic.

Table 7: Year 2014 Peak Hour Trip Generation (Existing Uses)

Lot No.	Peak Period	Projected Trip Ends	
10	AM Peak	Enter	(56)
		Exit	(20)
		Total	(76)
	PM Peak	Enter	(36)
		Exit	(57)
		Total	(93)
22	AM Peak	Enter	(29)
		Exit	(13)
		Total	(42)
	PM Peak	Enter	(117)
		Exit	(74)
		Total	(190)

Table 7: Year 2014 Peak Hour Trip Generation (Existing Uses) (Cont'd)

Lot No.	Peak Period	Projected Trip Ends	
23	AM Peak	Enter	(16)
		Exit	(3)
		Total	(19)
	PM Peak	Enter	(2)
		Exit	(15)
		Total	(17)

Table 8: Year 2014 Peak Hour Trip Generation (Proposed Developments)

Lot No.	Peak Period	Projected Trip Ends	
10	AM Peak	Enter	13
		Exit	66
		Total	79
	PM Peak	Enter	63
		Exit	31
		Total	94
14	AM Peak	Enter	197
		Exit	27
		Total	224
	PM Peak	Enter	37
		Exit	181
		Total	218
21	AM Peak	Enter	15
		Exit	71
		Total	86
	PM Peak	Enter	68
		Exit	34
		Total	102
22	AM Peak	Enter	10
		Exit	47
		Total	57
	PM Peak	Enter	150
		Exit	534
		Total	684
23	AM Peak	Enter	0
		Exit	0
		Total	0
	PM Peak	Enter	12
		Exit	57
		Total	69

2. Trip Distribution

Vehicular access to the proposed development on lots 10, 21, and 22 were assumed to be located along the adjacent north-south oriented connector streets. As such, access for Lot 10 was assumed to be provided off of Koula Street while access for Lots 21 and 22 were assumed to be provided off of Ahui Street. Access for Lot 14 was assumed to be off of a new access road connected to the Keawe Street and Ilalo Street intersection along the west edge of the property while access for Lot 23 was assumed to remain the same as existing off of Ala Moana Boulevard. The distribution of traffic for these lots from their access points and at the study intersections was based upon the assumed direction of travel given the existing distribution of population and activity centers on the island. As such, 72% of the trips were assumed to be traveling to and from the west, 7% were assumed to be traveling to and from the north, and 21% were assumed to be traveling to and from the east.

B. Through-Traffic Forecasting Methodology

The travel forecast is based upon the average annual traffic growth rate derived from data provided by the Oahu Metropolitan Planning Organization's regional travel demand forecasting model as described in the "Traffic Analysis for The Kakaako Makai Area Plan" prepared by Kaku Associates for the HCDA in March 1998. As such, the average daily traffic in the project vicinity is anticipated to increase at an average rate of 0.5% per year. Using 2004 as the Base Year, a growth factor of 1.05 was applied to the AM and PM existing traffic demands to achieve the projected Year 2014 traffic demands.

C. Traffic Signal Warrant

Due to the anticipated increases in traffic along Ilalo Street as a result of the development within the Kakaako Makai Area, traffic signal systems may be warranted at the intersections of Ilalo Street with Forrest Avenue, Keawe Street, Cooke Street, and Ahui Street. The installation of a traffic signal at an intersection may be justified by one or more of the eight warrants outlined in the "Manual on Uniform Traffic Control Devices for Streets and Highways," Millennium Edition

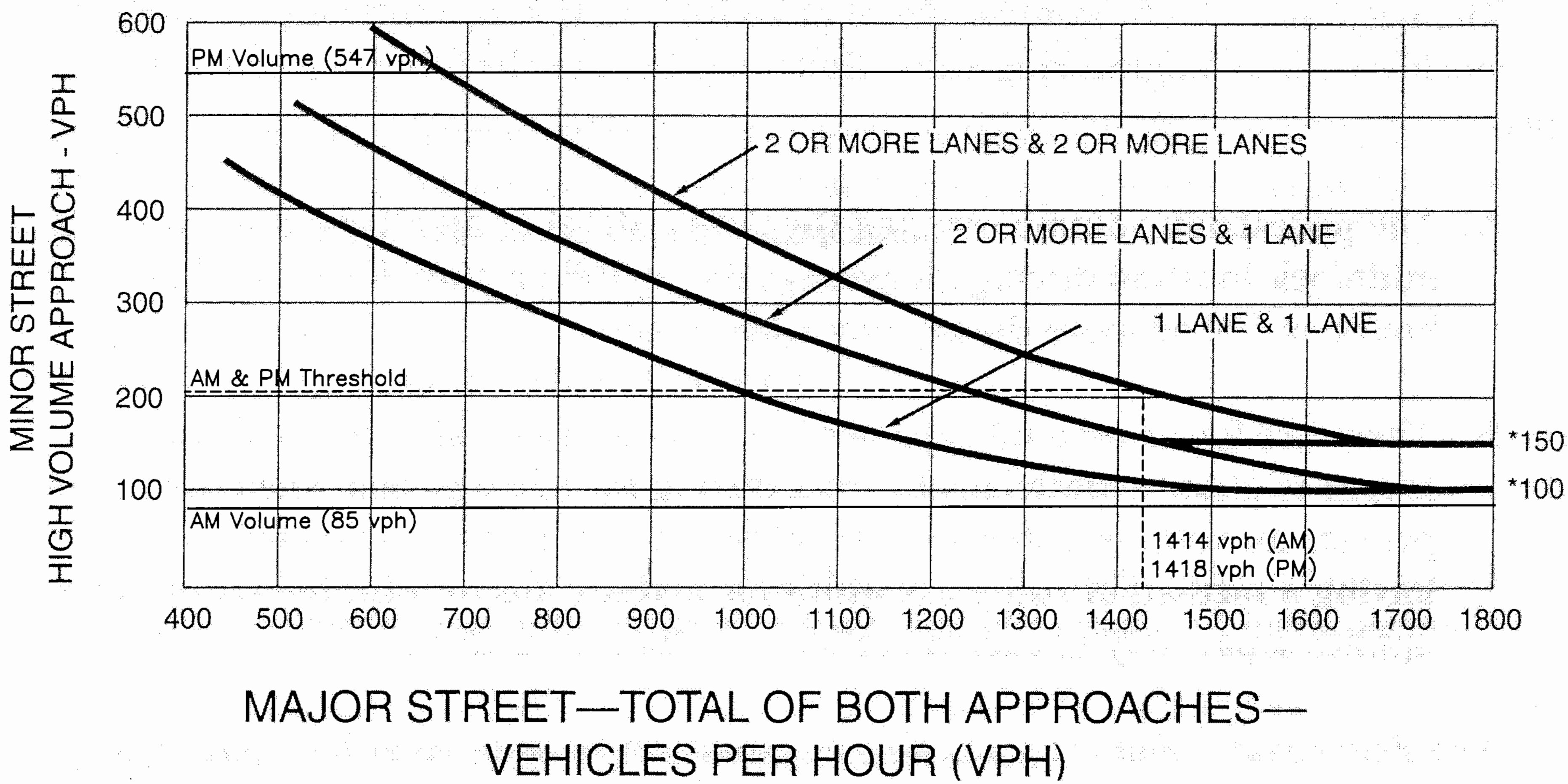
(MUTCD). These warrants take into account factors such as eight-hour vehicular volumes (Warrant 1), four-hour vehicular volumes (Warrant 2), peak hour volumes (Warrant 3), pedestrian volumes (Warrant 4), the presence of a school crossing or coordinated signal system (Warrants 5 and 6), crash experience (Warrant 7), and other characteristics of the roadway network (Warrant 8). Data was collected at the intersections of Ilalo Street with Forrest Avenue, Keawe Street, Cooke Street, and Ahui Street during the peak periods of traffic so Warrant 3 was applied to the intersections to determine whether or not a traffic signal system might be justified.

Warrant 3, the "Peak Hour Warrant," consists of several conditions that may justify the installation of a traffic signal at an intersection where vehicles experience high traffic delay and impaired safety during the peak hour periods. One of the conditions is based upon the relationship between the traffic volumes along the major and minor street. If the traffic volumes along the minor street exceed the thresholds shown in Figure 4C-3 of the MUTCD, a traffic signal system may be warranted. Under projected Year 2009 conditions, only the intersections of Ilalo Street with Forrest Avenue and Keawe Street have entering traffic volumes that are higher than the thresholds and, as such, satisfy Warrant 3 for minor street approaches with two lanes for high through traffic volumes on the major street (see Figures 11 to 14). These intersections may also satisfy the remaining warrants for traffic signal consideration which take into account factors other than peak hour volumes and requires further study.

D. Traffic Assessment

The cumulative Year 2014 projected AM and PM peak hour traffic conditions along Ala Moana Boulevard and Ilalo Street with the additional development of Lots 10, 14, 21, 22, and 23 in the Kakaako Makai Area are shown in Figures 15 to 18 and summarized in Tables 9 and 10. The cumulative volumes consist of site-generated traffic superimposed over projected Year 2014 traffic demands. Due to the anticipated increases in traffic in the project vicinity if the proposed development of the Makai Area is undertaken, modifications may be required to the intersections along Ala Moana Boulevard, as well as, Ilalo Street. Traffic operations in the project

Figure 4C-3. Warrant 3, Peak Hour



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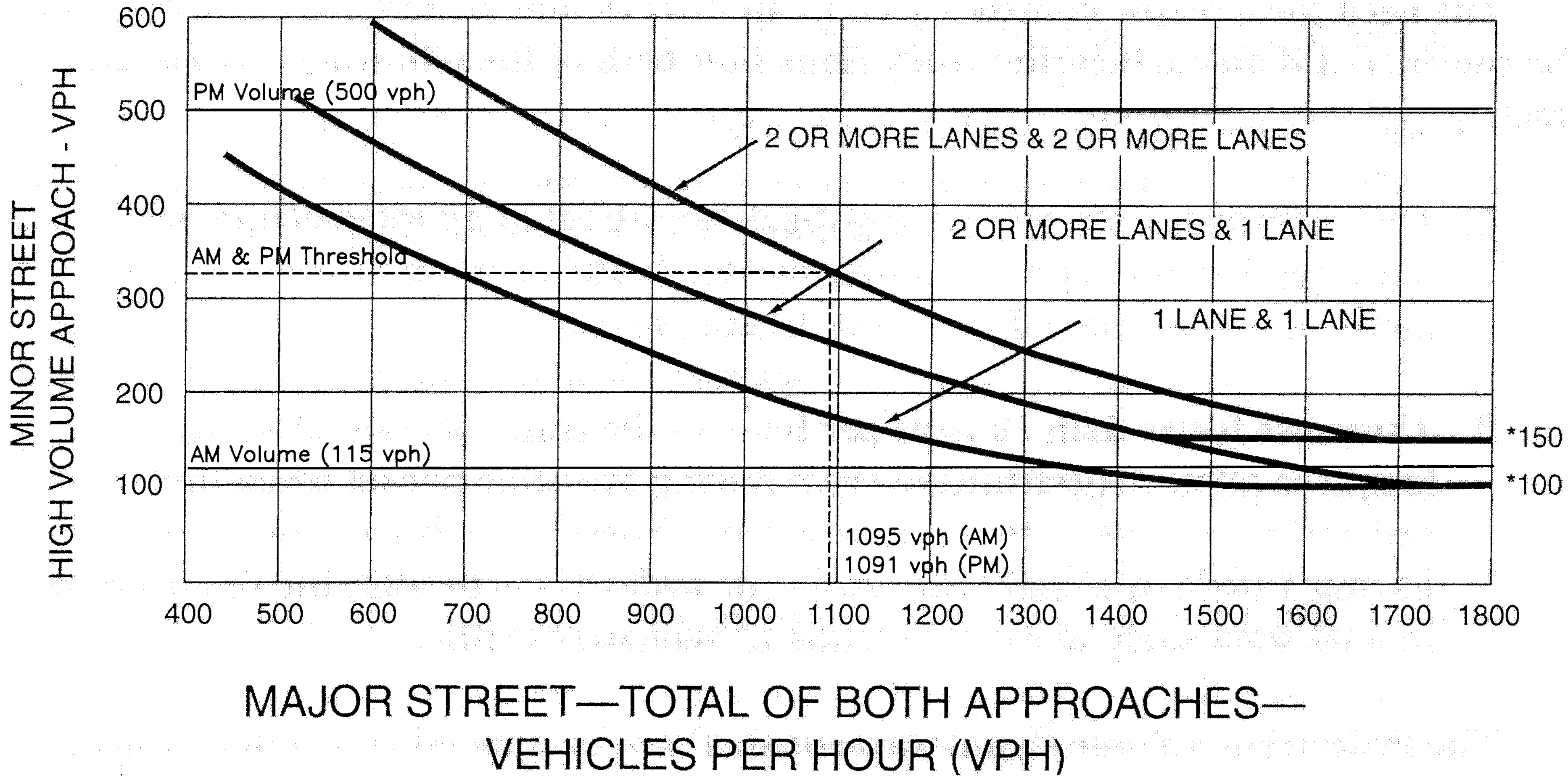
TRAFFIC SIGNAL WARRANT - FORREST AVENUE

FIGURE 11

Figure 4C-3. Warrant 3, Peak Hour



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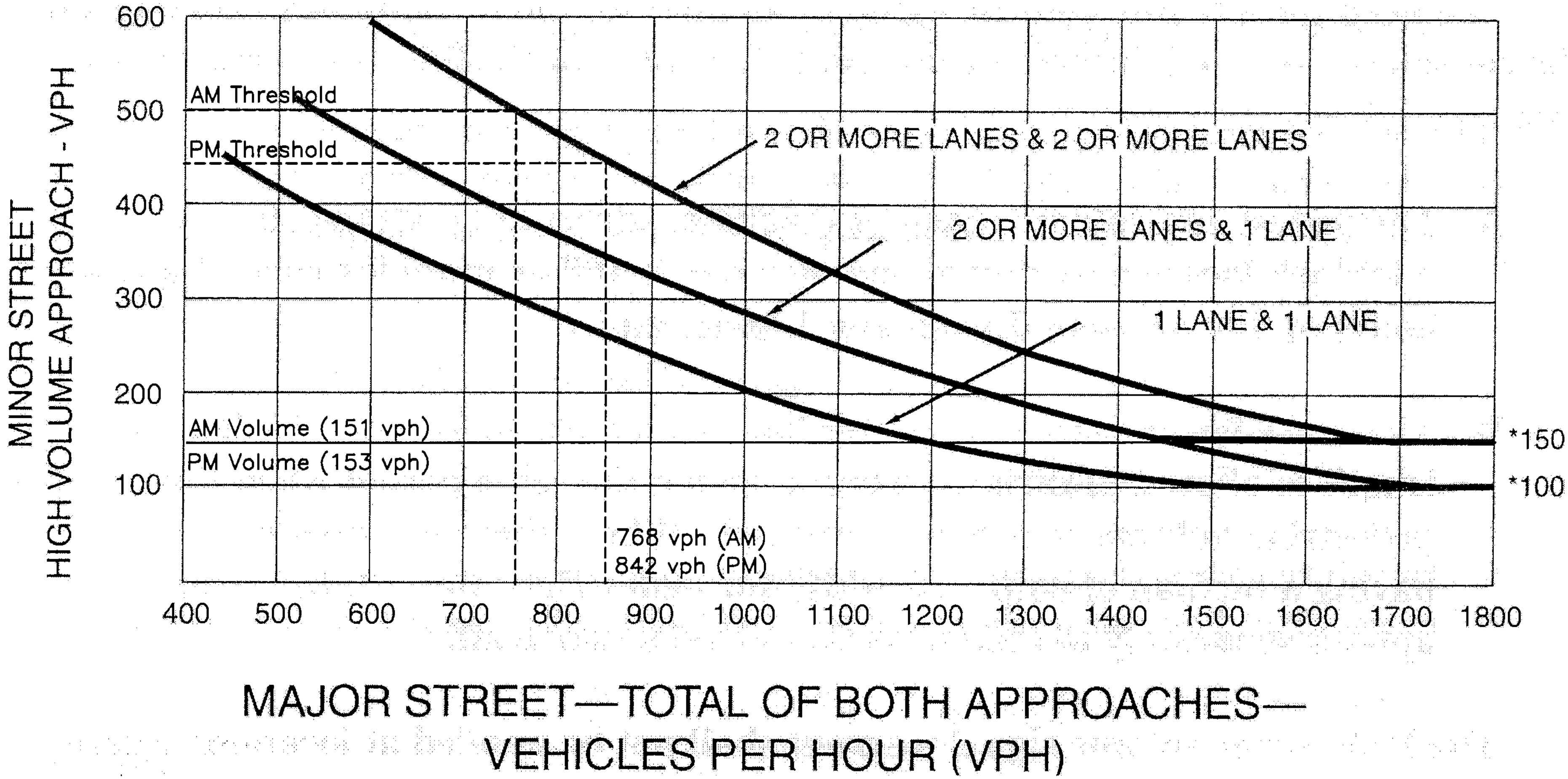
KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

TRAFFIC SIGNAL WARRANT - KEAWE STREET

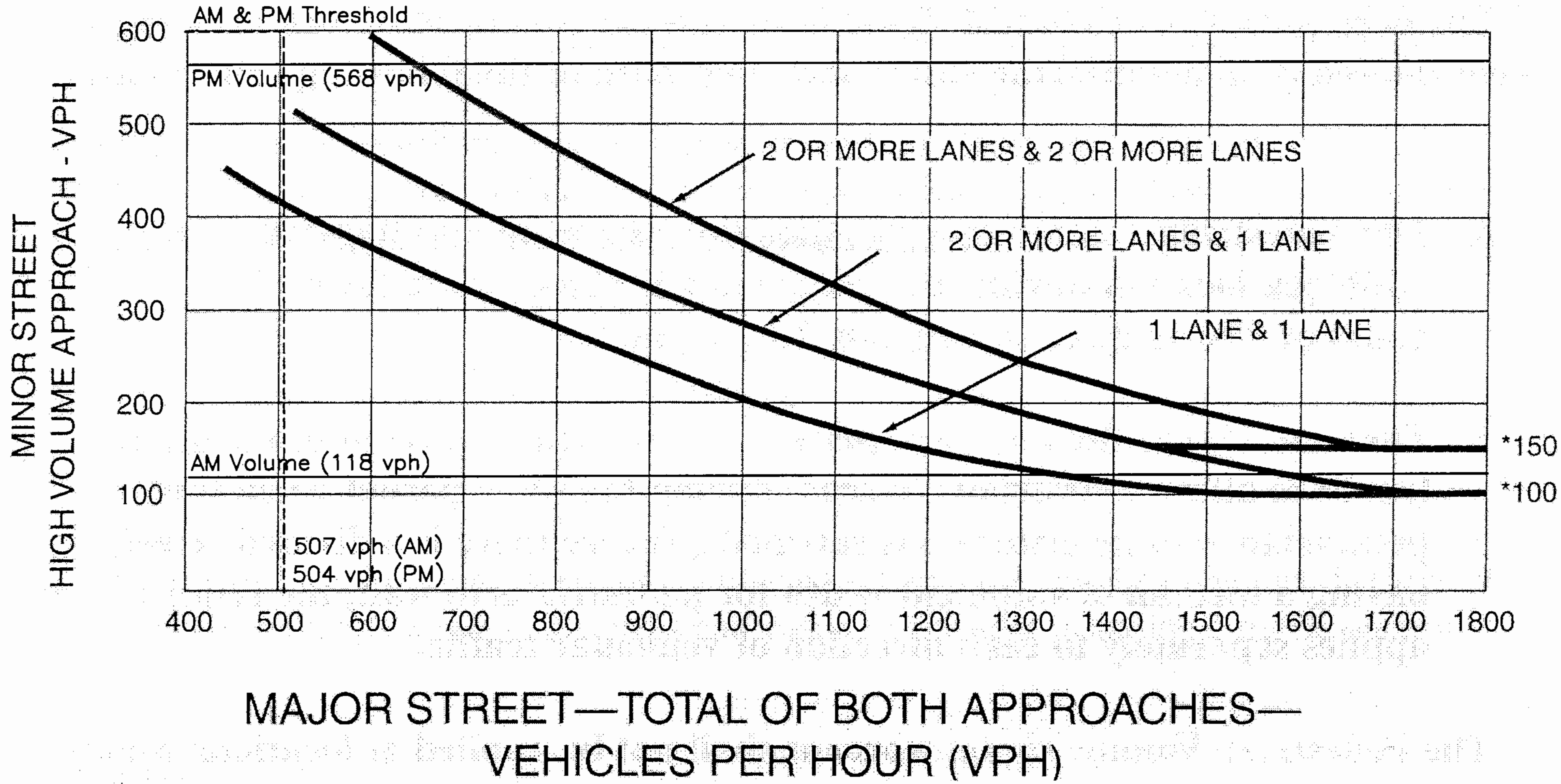
FIGURE 12

Figure 4C-3. Warrant 3, Peak Hour



WILSON OKAMOTO CORPORATION ENGINEERS • PLANNERS	KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA TRAFFIC SIGNAL WARRANT - COOKE STREET	FIGURE 13

Figure 4C-3. Warrant 3, Peak Hour



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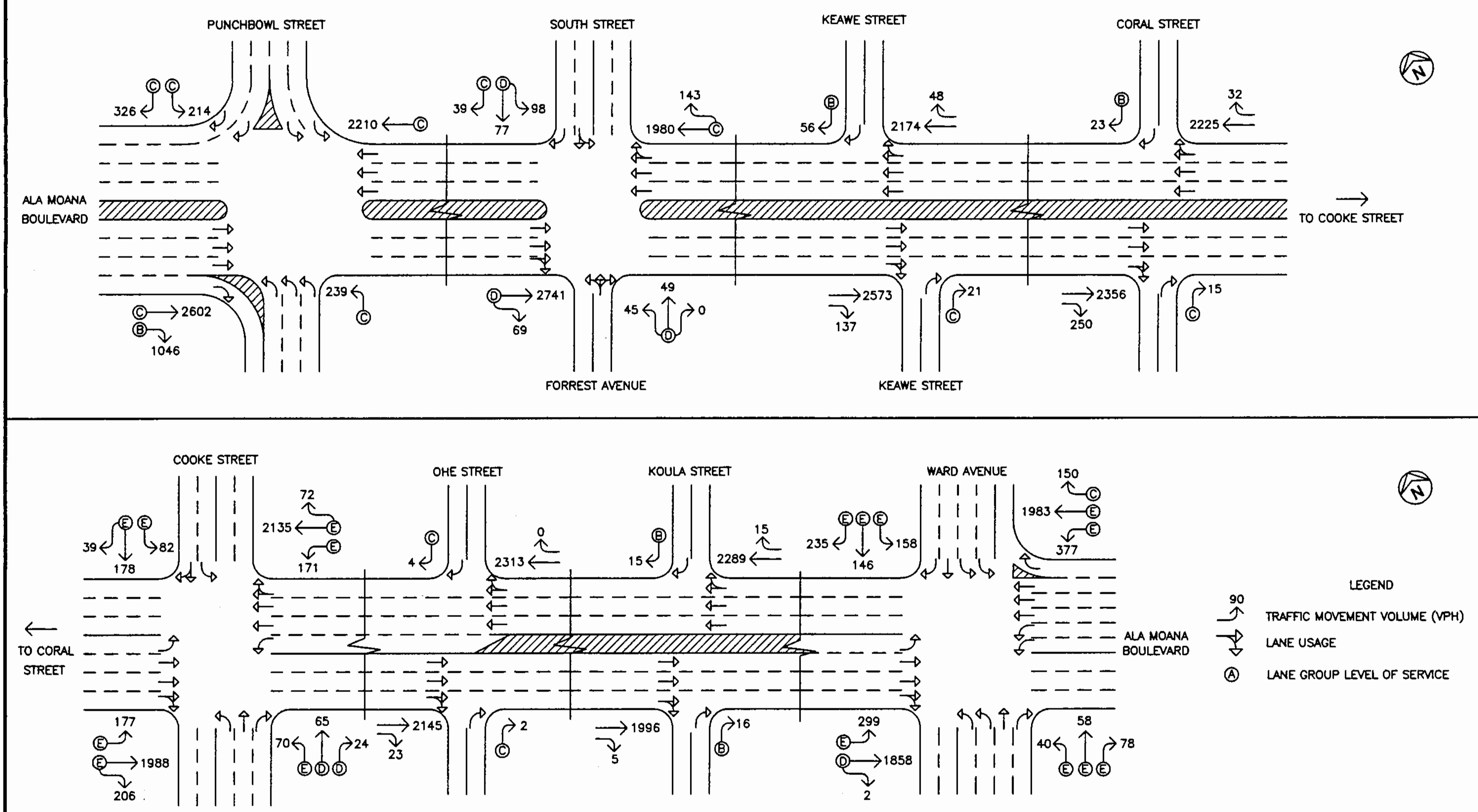
KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

TRAFFIC SIGNAL WARRANT - AHUI STREET

FIGURE 14



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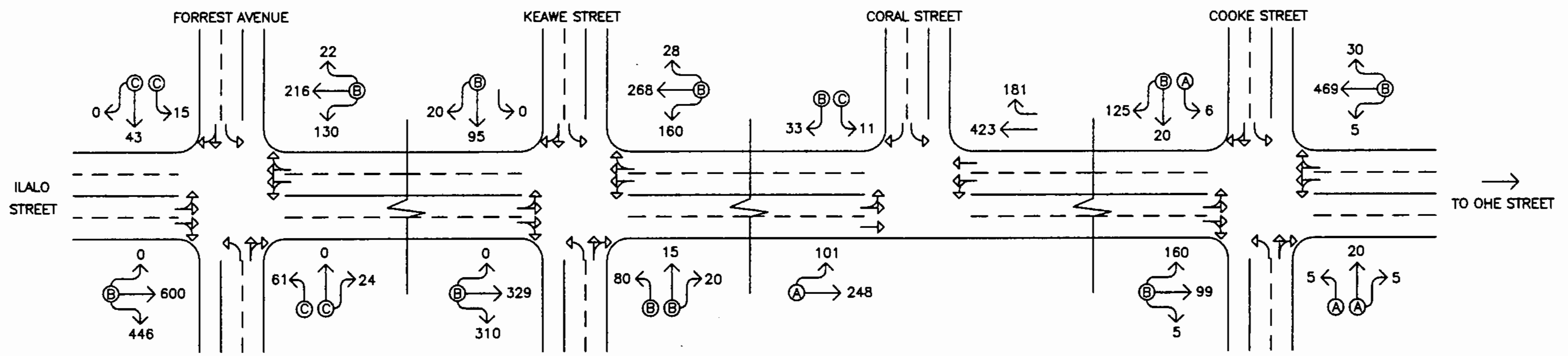
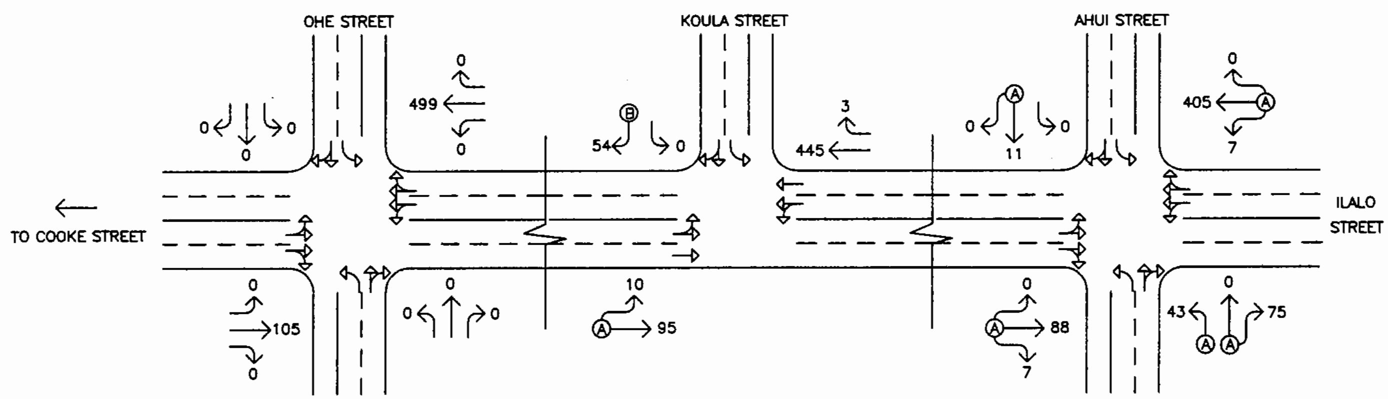
YEAR 2014 AM PEAK HOUR OF TRAFFIC WITH PROJECT
ALA MOANA BOULEVARD

FIGURE 15





LEGEND

90 TRAFFIC MOVEMENT VOLUME (VPH)

LANE USAGE

Ⓐ LANE GROUP LEVEL OF SERVICE

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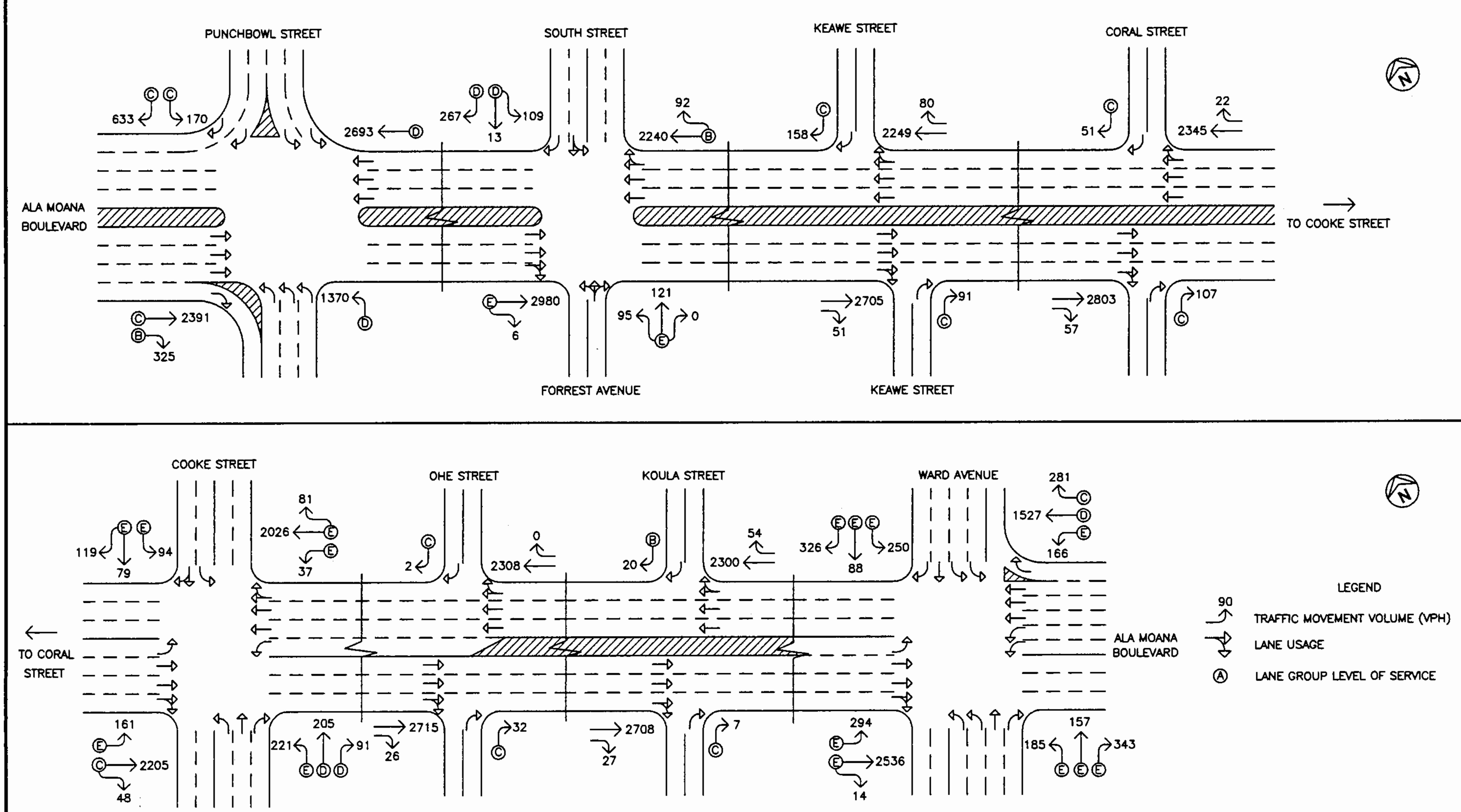
KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

YEAR 2014 AM PEAK HOUR OF TRAFFIC WITH PROJECT
ILALO STREET

FIGURE
16



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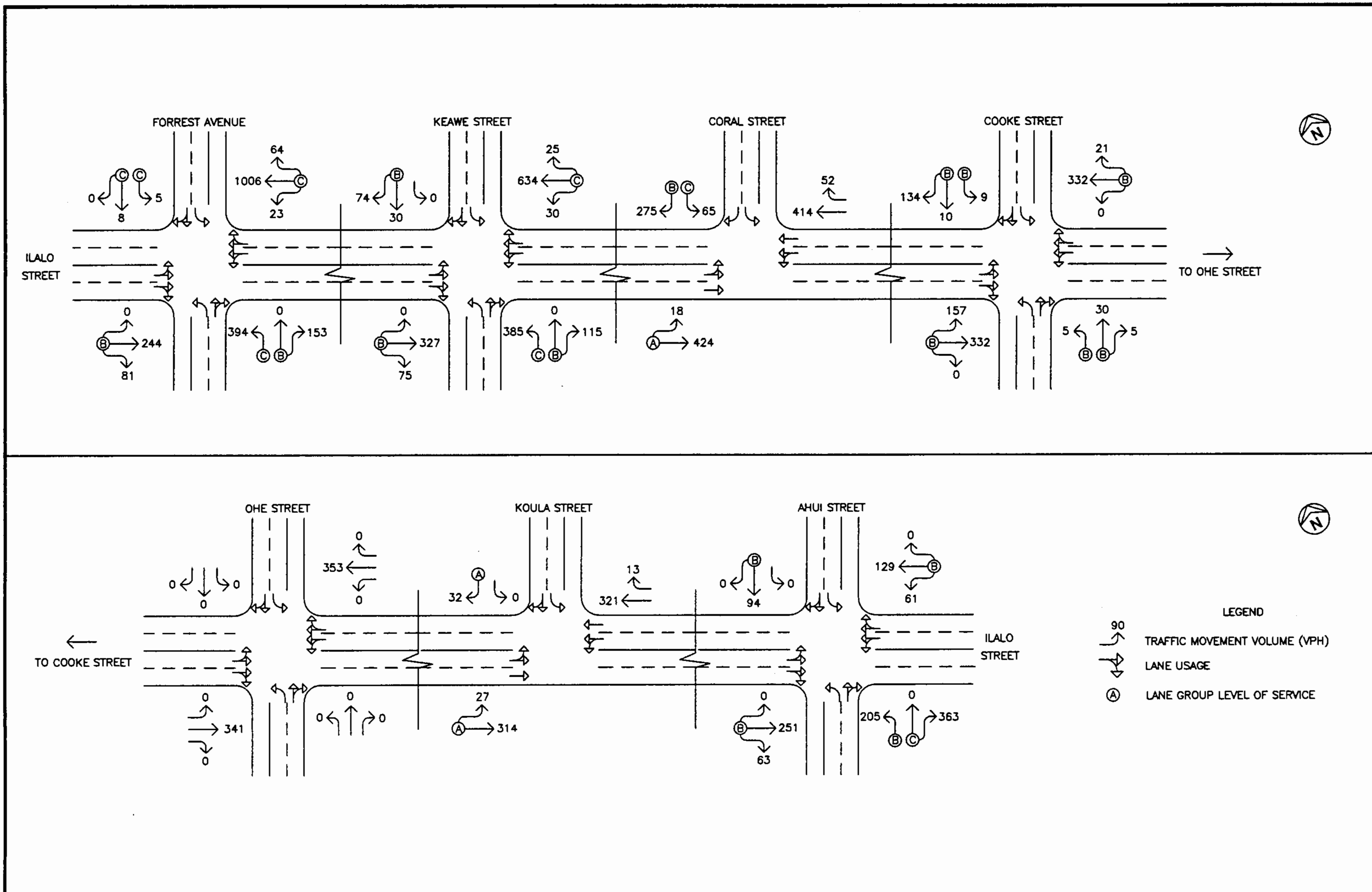
KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

YEAR 2014 PM PEAK HOUR OF TRAFFIC WITH PROJECT
ALA MOANA BOULEVARD

FIGURE 17



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YEAR 2014 PM PEAK HOUR OF TRAFFIC WITH PROJECT ILALO STREET

FIGURE 18

vicinity are expected to deteriorate from Year 2009 with project conditions with most of the traffic movements at the intersections of Ala Moana Boulevard with Keawe Street, Coral Street, and Ward Avenue anticipated to operate at an unacceptable LOS "F" during the PM peak period. In addition, the northbound left-turn traffic movement at the intersection of Ilalo Street with Keawe Street is anticipated to operate at an unacceptable LOS "E" during the AM peak period while the westbound approach and the northbound left-turn traffic movement at the intersection with Forrest Avenue is anticipated to operate at an unacceptable LOS "F" during the PM peak period. As such, for the purpose of this report, the intersections of Ala Moana Boulevard with Cooke Street and Ward Avenue are assumed to be modified by the Year 2009 to accommodate the projected increases in traffic at those intersections. In addition, left-turns into and out of the Makai Area along Ala Moana Boulevard at South Street/Forrest Avenue, Keawe Street, Coral Street, and Koula Street are assumed to be restricted to improve traffic progression and queuing along Ala Moana Boulevard and the traffic control at those intersections modified to accommodate the new lane use configurations. Along Ilalo Street, traffic signal systems are assumed to have been installed at the intersections with Forrest Avenue and Keawe Street to alleviate the anticipated traffic operating conditions at those intersections. The projected Year 2009 traffic operating conditions are provided in Tables 9 and 10 for comparison purposes. LOS calculations are included in Appendix E.

Table 9: Projected Year 2009 and 2014 Traffic Operating Conditions Ala Moana Boulevard

Intersecting Street	Traffic Movement		AM			PM		
			Year 2009 w/ Imp	Year 2014		Year 2009 w/ Imp	Year 2014	
				w/ out Imp	w/ Imp		w/ out Imp	w/ Imp
Punchbowl St	Eastbound	TH	D	D	C	D	D	C
		RT	A	A	B	B	B	B
	Westbound	TH-RT	B	B	C	D	D	D
	Northbound	LT	D	D	C	D	D	D

**Table 9: Projected Year 2009 and 2014 Traffic Operating Conditions
Ala Moana Boulevard (Cont'd)**

Intersecting Street	Traffic Movement		AM			PM		
			Year 2009 w/ Imp	Year 2014		Year 2009 w/ Imp	Year 2014	
				w/ out Imp	w/ Imp		w/ out Imp	w/ Imp
Punchbowl St (Cont'd)	Southbound	LT	D	D	C	C	C	C
		RT	D	D	C	D	D	C
South St/Forrest Ave	Eastbound	LT	D	E	-	E	E	-
		TH-RT	B	B	D	D	E	E
	Westbound	TH-RT	D	D	C	E	E	B
	Northbound	LT-TH-RT	D	E	D	E	E	E
	Southbound	LT-TH	D	D	D	D	D	D
		RT	D	D	C	E	E	D
Keawe St	Eastbound	LT	E	E	-	E	F	-
		TR-RT	E	E	-	E	F	-
	Westbound	LT	E	E	-	E	E	-
		TH-RT	C	C	-	C	D	-
	Northbound	LT-TH	E	E	-	E	F	-
		RT			C			C
	Southbound	LT-TH	E	E	-	E	F	-
		RT			B			C
Coral St	Eastbound	LT	D	D	-	E	E	-
		TH-RT	D	D	-	E	F	-
	Westbound	LT	D	D	-	E	F	-
		TH-RT	C	D	-	C	C	-
	Northbound	LT-TH	D	D	-	E	F	-
		RT			C			C
	Southbound	LT-TH	D	D	-	E	F	-
		RT			B			C

Table 9: Projected Year 2009 and 2014 Traffic Operating Conditions
Ala Moana Boulevard (Cont'd)

Intersecting Street	Traffic Movement		AM			PM		
			Year 2009 w/ Imp	Year 2014		Year 2009 w/ Imp	Year 2014	
				w/ out Imp	w/ Imp		w/ out Imp	w/ Imp
Cooke St	Eastbound	LT	D	D	E	E	E	E
		TH-RT	D	D	E	E	D	C
	Westbound	LT	D	D	E	E	E	E
		TH-RT	D	D	E	D	E	E
	Northbound	LT	D	D	E	D	E	E
		TH			D			D
		RT	D	D	D	D	D	D
	Southbound	LT-TH	D	D	E	E	E	E
		RT	D	D	E	E	E	E
Ohe St	Northbound	RT	C	C	C	C	C	C
	Southbound	RT	C	C	C	C	C	C
Koula St	Eastbound	LT	D	D	-	E	E	-
		TH-RT	D	C	-	E	E	-
	Westbound	LT	D	D	-	D	E	-
		TH-RT	D	D	-	C	C	-
	Northbound	LT-TH	D	D	-	D	E	-
		RT			B			C
	Southbound	LT-TH	D	D	-	E	E	-
		RT			B			B
Ward Ave	Eastbound	LT	E	F	E	E	F	E
		TH-RT	D	D	D	E	F	E
	Westbound	LT	E	E	E	E	F	E
		TH	E	F	E	D	D	D
		RT	C	C	C	C	C	C

Table 9: Projected Year 2009 and 2014 Traffic Operating Conditions Ala Moana Boulevard (Cont'd)

Intersecting Street	Traffic Movement		AM			PM		
			Year 2009 w/ Imp	Year 2014 w/ out Imp	Year 2014 w/ Imp	Year 2009 w/ Imp	Year 2014 w/ out Imp	Year 2014 w/ Imp
Ward Ave (Cont'd)	Northbound	LT	E	E	E	E	E	E
		TH			E			
		RT	E	F	E	E	F	E
	Southbound	LT	E	F	E	E	F	E
		TH			E			
		RT			E			

Table 10: Projected Year 2009 and 2014 Traffic Operating Conditions Ilalo Street

Intersecting Street	Traffic Movement		AM			PM		
			Year 2009	Year 2014 w/ out Imp	Year 2014 w/ Imp	Year 2009	Year 2014 w/ out Imp	Year 2014 w/ Imp
Forrest Ave	Eastbound	LT-TH-RT	C	D	B	B	C	B
	Westbound	LT-TH-RT	B	B	B	C	F	C
	Northbound	LT	B	B	C	C	F	C
		TH-RT	A	B	C	B	B	B
	Southbound	LT	B	B	C	B	B	C
		TH-RT	B	B	C	B	B	C
Keawe St	Eastbound	LT-TH-RT	B	B	B	B	C	B
	Westbound	LT-TH-RT	B	C	B	B	B	C
	Northbound	LT	B	E	B	D	B	C
		TH-RT	A	B	B	B	B	B
	Southbound	LT	A	B	B	A	A	B
		TH-RT	B	B	B	B	B	B

Table 10: Projected Year 2009 and 2014 Traffic Operating Conditions Ilalo Street (Cont'd)

Intersecting Street	Traffic Movement		AM			PM		
			Year 2009	Year 2014		Year 2009	Year 2014	
				w/ out Imp	w/ Imp		w/ out Imp	w/ Imp
Coral St	Eastbound	LT-TH	A	A	A	A	A	A
	Southbound	LT	B	C	C	B	C	C
		RT	A	A	B	A	B	B
Cooke St	Eastbound	LT-TH-RT	A	A	B	A	B	B
	Westbound	LT-TH-RT	A	A	B	A	B	B
	Northbound	LT	A	A	A	A	A	B
		TH-RT	A	A	A	A	A	B
	Southbound	LT	A	A	A	A	A	B
		TH-RT	A	A	B	A	A	B
Koula St	Eastbound	LT-TH	-	A	A	-	A	A
	Southbound	LT	-	B	B	-	B	B
		RT	-	A	B	-	A	A
Ahui St	Eastbound	LT-TH-RT	-	A	A	-	B	B
	Westbound	LT-TH-RT	-	A	A	-	B	B
	Northbound	LT	-	A	A	-	B	B
		TH-RT	-	A	A	-	C	C
	Southbound	LT	-	A	A	-	A	A
		TH-RT	-	A	A	-	B	B

Despite the anticipated increases in traffic along Ala Moana Boulevard due to ambient traffic growth and development of additional lots within the Kakaako Makai Area, traffic operations along Ala Moana Boulevard are expected remain similar to or improve from Year 2009 conditions due to the lane usage and intersection control modifications along that roadway. The traffic movements at the intersection with Punchbowl Street are anticipated to operate at LOS "D" or better during both peak periods while those at the intersections with South Street/Forrest Avenue, Cooke

Street, and Ward Avenue are anticipated to operate at LOS "E" or better during both peak periods. At the intersections with Keawe Street, Coral Street, Ohe Street, and Koula Street, traffic along Ala Moana Boulevard operates well since vehicles are allowed to flow freely through the intersection unimpeded due to intersection control modifications at those intersections. Traffic on the northbound and southbound approaches of those intersections are required to yield to vehicles along Ala Moana Boulevard, but are still are anticipated to operate at LOS "C' or better during both peak periods.

At the intersections along Ilalo Street, traffic operations are anticipated to deteriorate from Year 2009 conditions due to the increase in site-generated traffic from Lots 10, 13, 21, 22, and 23 along that roadway. The traffic movements at the intersection with Cooke Street are anticipated to operate at LOS "B" or better during both peak periods while those at the intersections with Coral Street, Koula Street, and Ahui Street are anticipated to operate at LOS "C" or better during both peak periods. At the intersections with Forrest Avenue and Keawe Street, traffic operations are anticipated to operate at LOS "C" or better during both peak periods due to the installation of traffic signal systems at those intersections.

E. Recommendations for Year 2014

Based on the analysis of the traffic data and the preliminary development schedule, the following are the recommendations of this study for the Year 2014:

1. Maintain adequate turning radii at all roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.

2. Maintain adequate sight distances for motorists to safely enter and exit all roadways.

3. Prohibit northbound and southbound left-turn and through traffic movements at the following intersections along Ala Moana Boulevard (see Figure 19):
    - Keawe Street
    - Coral Street
    - Koula Street

4. Prohibit eastbound and westbound left-turn traffic movements at the following intersections along Ala Moana Boulevard (see Figure 19):
   - South Street/Forrest Avenue
   - Keawe Street
   - Coral Street
   - Koula Street

5. Consider converting the existing left-turn lanes/striped median along Ala Moana Boulevard to a raised median to provide shelter for crossing pedestrians.

6. Prohibit parking along Cooke Street between Ala Moana Boulevard and Ilalo Street to provide two lanes in each direction along that segment.

7. Modify the existing lane use along Cooke Street north of Ala Moana Boulevard to provide an exclusive southbound left-turn lane and a shared through and right-turn lane (see Figure 20).

8. Provide exclusive northbound left-turn, through, and right-turn lanes along Cooke Street south of Ala Moana Boulevard (see Figure 20).

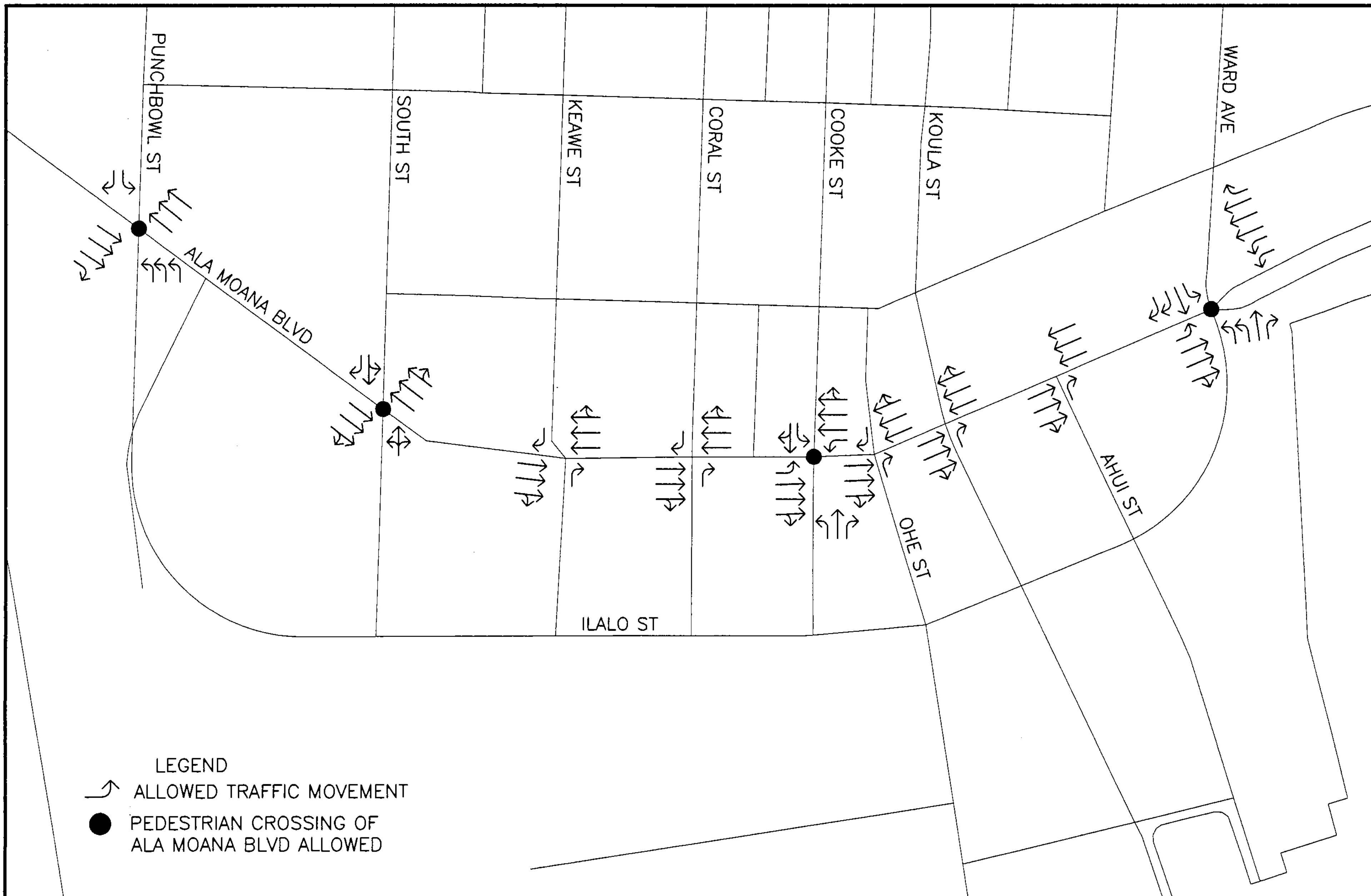
9. Verify the length of the left-turn lanes along Ala Moana Boulevard at the intersection of Cooke Street to provide adequate storage for vehicles at that intersection.

10. Modify the existing lane use along Ward Avenue north of Ala Moana Boulevard to provide one northbound departure lane, two exclusive southbound left-turn lanes, and exclusive through and right-turn lanes (see Figure 21).

11. Provide two exclusive northbound left-turn lanes and exclusive through and right-turn lanes along Ilalo Street south of Ala Moana Boulevard (see Figure 21).

12. Provide two westbound left-turn lanes along Ala Moana Boulevard for vehicles turning left onto Ilalo Street (see Figure 21).

13. Modify the traffic signal timing and phasing at the intersections of Ala Moana Boulevard with Cooke Street and Ward Avenue to accommodate the modified lane configurations.



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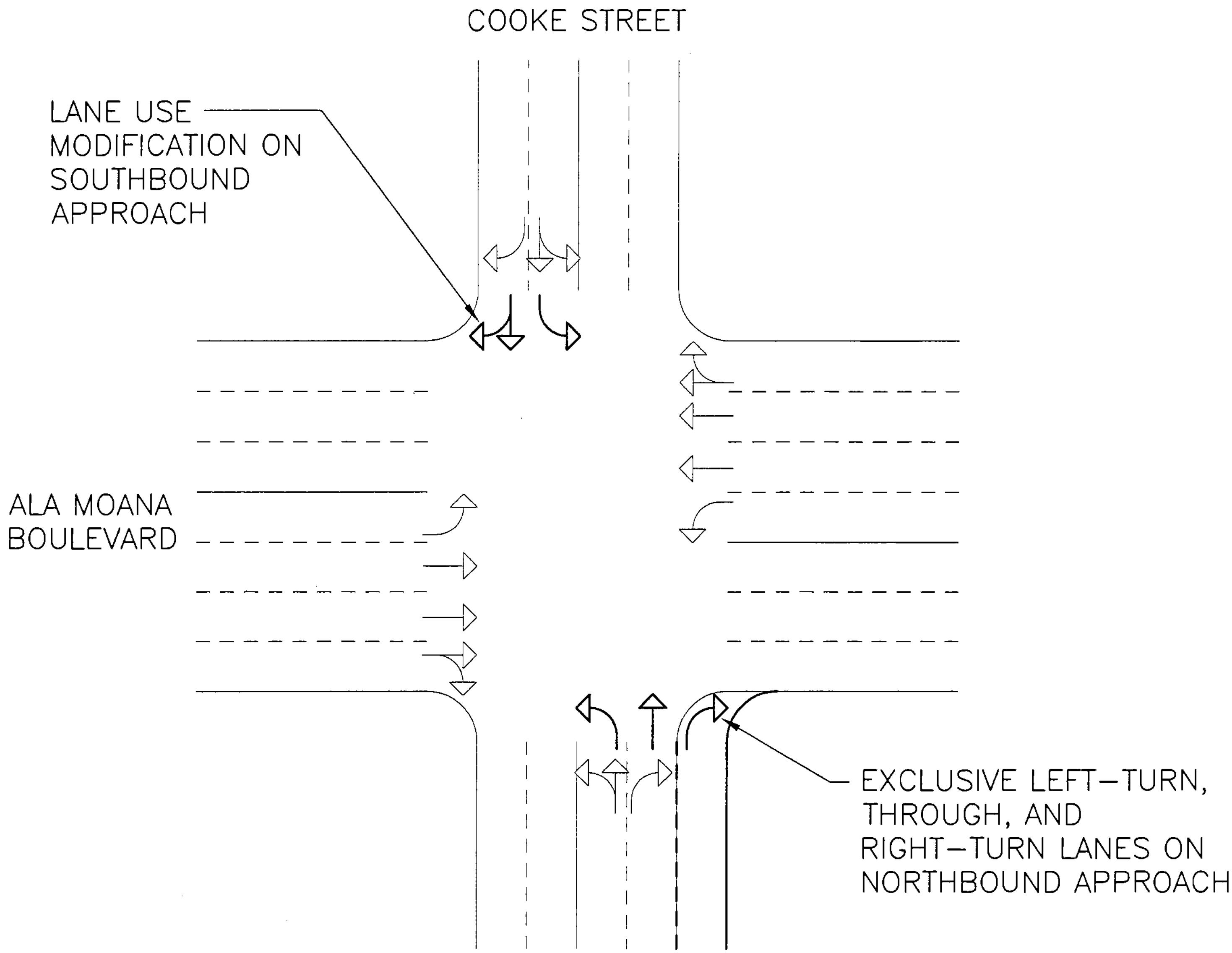
KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

YEAR 2014 RECOMMENDED IMPROVEMENTS SCHEMATIC LAYOUT
ALA MOANA BOULEVARD

FIGURE 19



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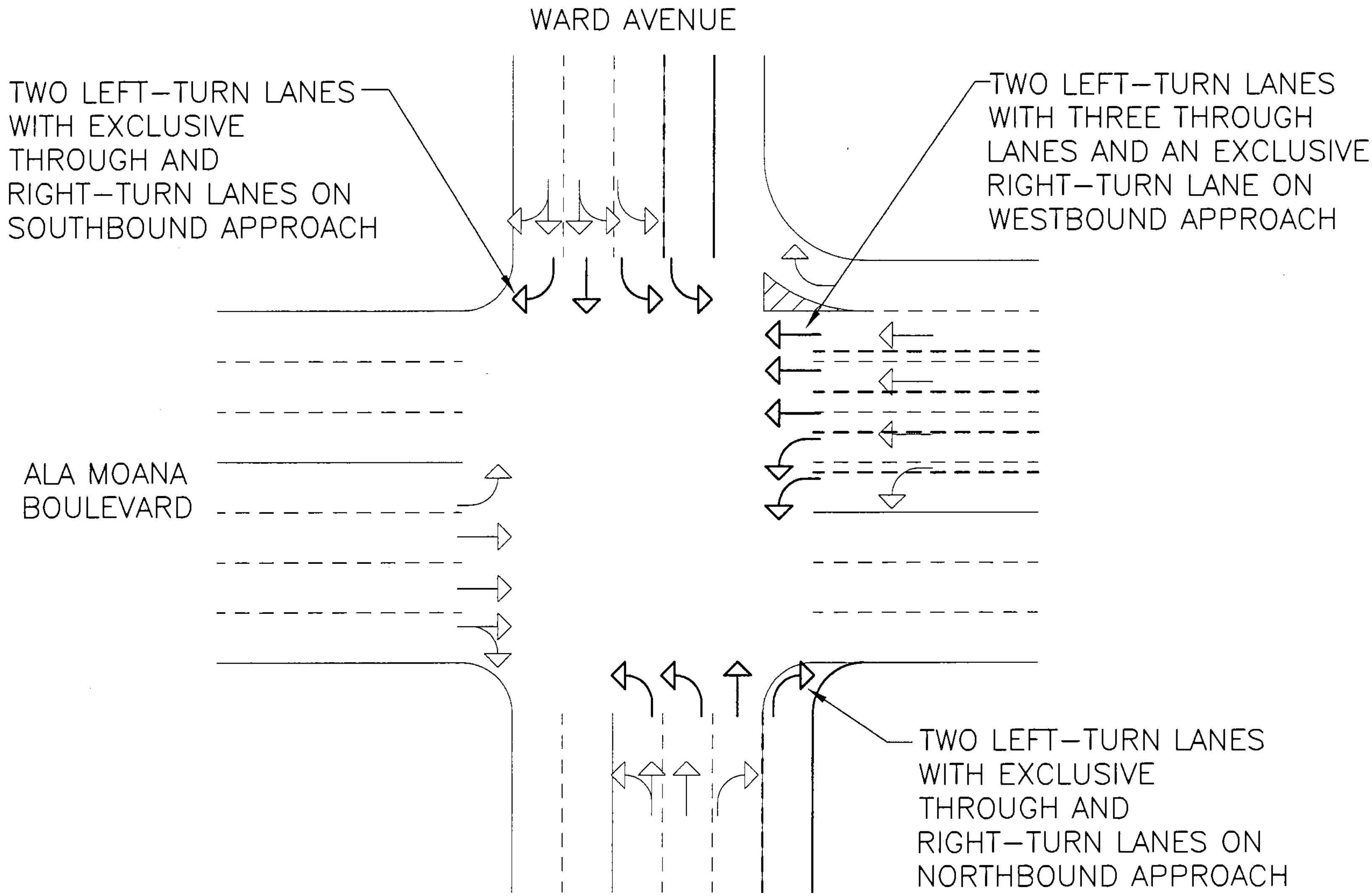
YEAR 2014 RECOMMENDED IMPROVEMENTS SCHEMATIC LAYOUT
COOKE ST AND ALA MOANA BLVD

FIGURE
20



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KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

YEAR 2014 RECOMMENDED IMPROVEMENTS SCHEMATIC LAYOUT
WARD AVE AND ALA MOANA BLVD

FIGURE 21

14. Conduct full traffic signal warrant studies for the intersections of Ilalo Street with Forrest Avenue, Keawe Street, Cooke Street, and Ahui Street after the Year 2009. Install traffic signal systems where warranted. Preliminary application of the warrants indicate the potential need for a traffic signal system at the intersections with Forrest Avenue and Keawe Street.

VI. YEAR 2025 PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 7th Edition," 2003. The ITE trip generation rates are developed empirically by correlating the vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per 1,000 square feet of development or dwelling unit. Some of the lots have existing uses that will be replaced by the proposed new developments. As such, the trips generated by these existing uses were removed from the existing roadway network and replaced by the trips associated with the proposed developments. Since the Kakaako Makai Area is envisioned to be a walkable, mixed-use community where people can live, work, shop, and play, for the purpose of this report, 20% of the trips generated by the proposed residential developments during both peak periods were assumed to be walking trips. Tables 11 and 12 summarize the trip generation characteristics applied to the AM and PM peak hours of traffic.

Table 11: Year 2025 Peak Hour Trip Generation (Existing Uses)

Lot No.	Peak Period	Projected Trip Ends	
12	AM Peak	Enter	(222)
		Exit	(30)
		Total	(252)
	PM Peak	Enter	(41)
		Exit	(200)
		Total	(241)

Table 11: Year 2025 Peak Hour Trip Generation (Existing Uses)(Cont'd)

Lot No.	Peak Period	Projected Trip Ends	
20	AM Peak	Enter	(21)
		Exit	(4)
		Total	(25)
	PM Peak	Enter	(3)
		Exit	(19)
		Total	(22)

Table 12: Year 2025 Peak Hour Trip Generation (Proposed Developments)

Lot No.	Peak Period	Projected Trip Ends	
4	AM Peak	Enter	400
		Exit	54
		Total	454
	PM Peak	Enter	71
		Exit	346
		Total	417
5	AM Peak	Enter	26
		Exit	4
		Total	30
	PM Peak	Enter	15
		Exit	75
		Total	90
11	AM Peak	Enter	17
		Exit	85
		Total	102
	PM Peak	Enter	81
		Exit	40
		Total	121
12	AM Peak	Enter	93
		Exit	53
		Total	146
	PM Peak	Enter	62
		Exit	124
		Total	186
20	AM Peak	Enter	9
		Exit	9
		Total	18
	PM Peak	Enter	27
		Exit	27
		Total	54

2. Trip Distribution

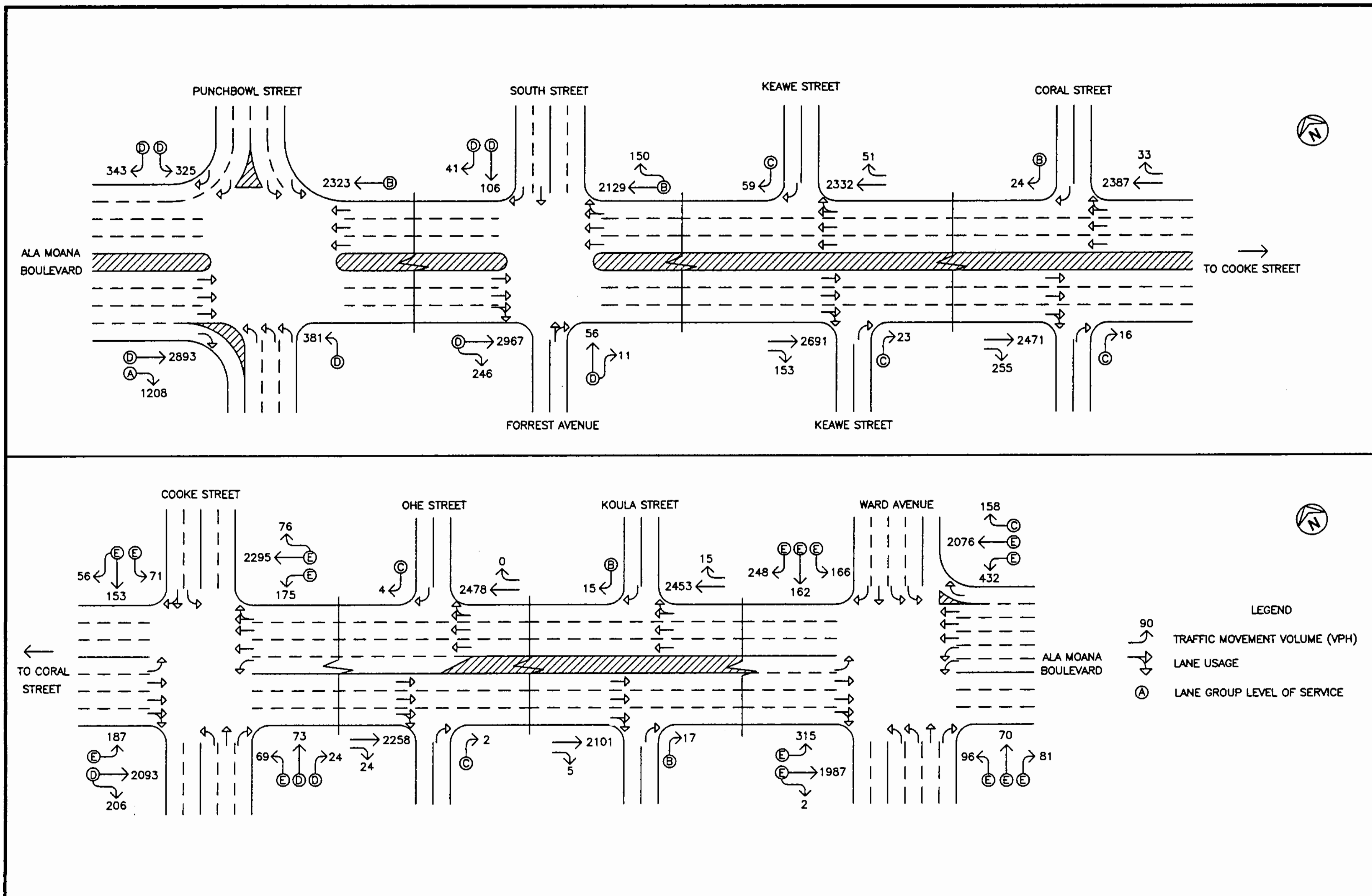
Vehicular access to the proposed developments on lots 4, 5, 11, and 12 were assumed to be located along the adjacent north-south oriented connector streets. As such, access for Lot 4 was assumed to be provided off of Forrest Avenue, access for Lot 5 was assumed to be provided off of Keawe Street, and access for Lots 11 and 12 was assumed to be off of Ahui Street. Since parking for Lot 20 will be provided on Lot 21, the site-generated trips associated with the development of Lot 20 were assumed to utilize the access for Lot 21 off of Ahui Street. The distribution of traffic for these three lots from their access points and at the study intersections was based upon the assumed direction of travel given the existing distribution of population and activity centers on the island. As such, 72% of the trips were assumed to be traveling to and from the west, 7% were assumed to be traveling to and from the north, and 21% were assumed to be traveling to and from the east.

B. Through-Traffic Forecasting Methodology

The travel forecast is based upon the average annual traffic growth rate derived from data provided by the Oahu Metropolitan Planning Organization's regional travel demand forecasting model as described in the "Traffic Analysis for The Kakaako Makai Area Plan" prepared by Kaku Associates for the HCDA in March 1998. As such, the average daily traffic in the project vicinity is anticipated to increase at an average rate of 0.5% per year. Using 2004 as the Base Year, a growth factor of 1.105 was applied to the AM and PM existing traffic demands to achieve the projected Year 2025 traffic demands.

C. Traffic Assessment

The cumulative Year 2025 projected AM and PM peak hour traffic conditions along Ala Moana Boulevard and Ilalo Street with the additional development of Lots 4, 5, 11, 12, and 20 in the Kakaako Makai Area are shown in Figures 22 to 25 and summarized in Tables 13 and 14. The cumulative volumes consist of site-generated traffic superimposed over projected Year 2025 traffic demands. Due to the anticipated increases in traffic in the project vicinity if the proposed development of



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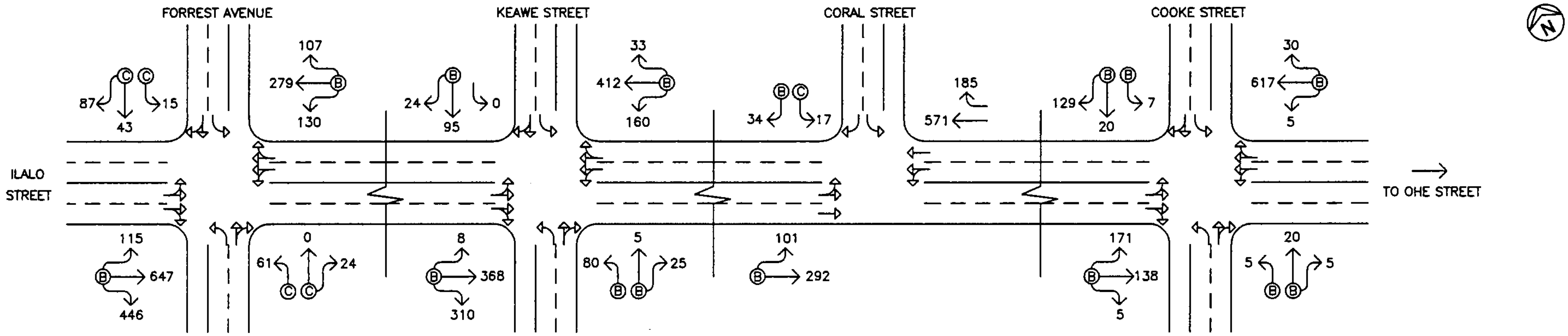
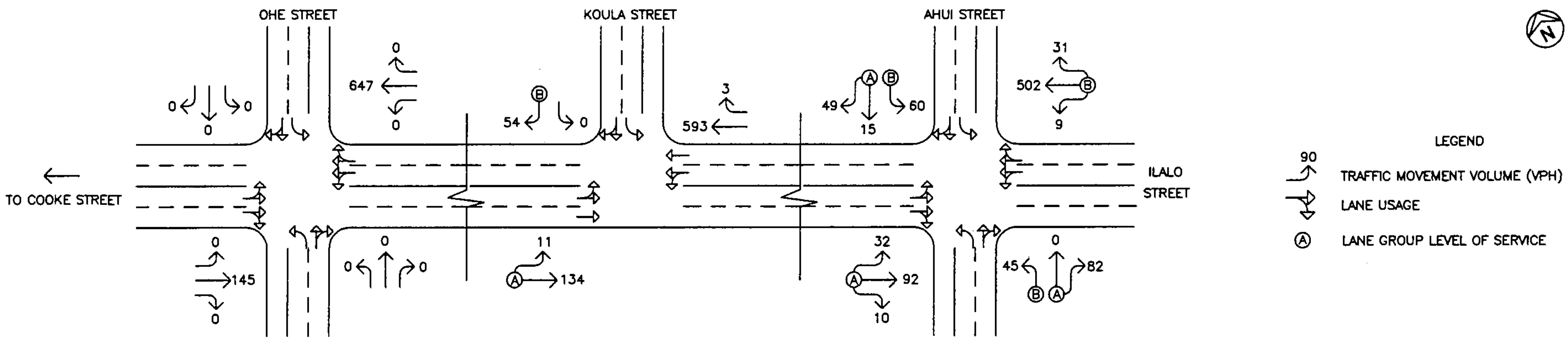
KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

YEAR 2025 AM PEAK HOUR OF TRAFFIC WITH PROJECT
ALA MOANA BOULEVARD

FIGURE 22





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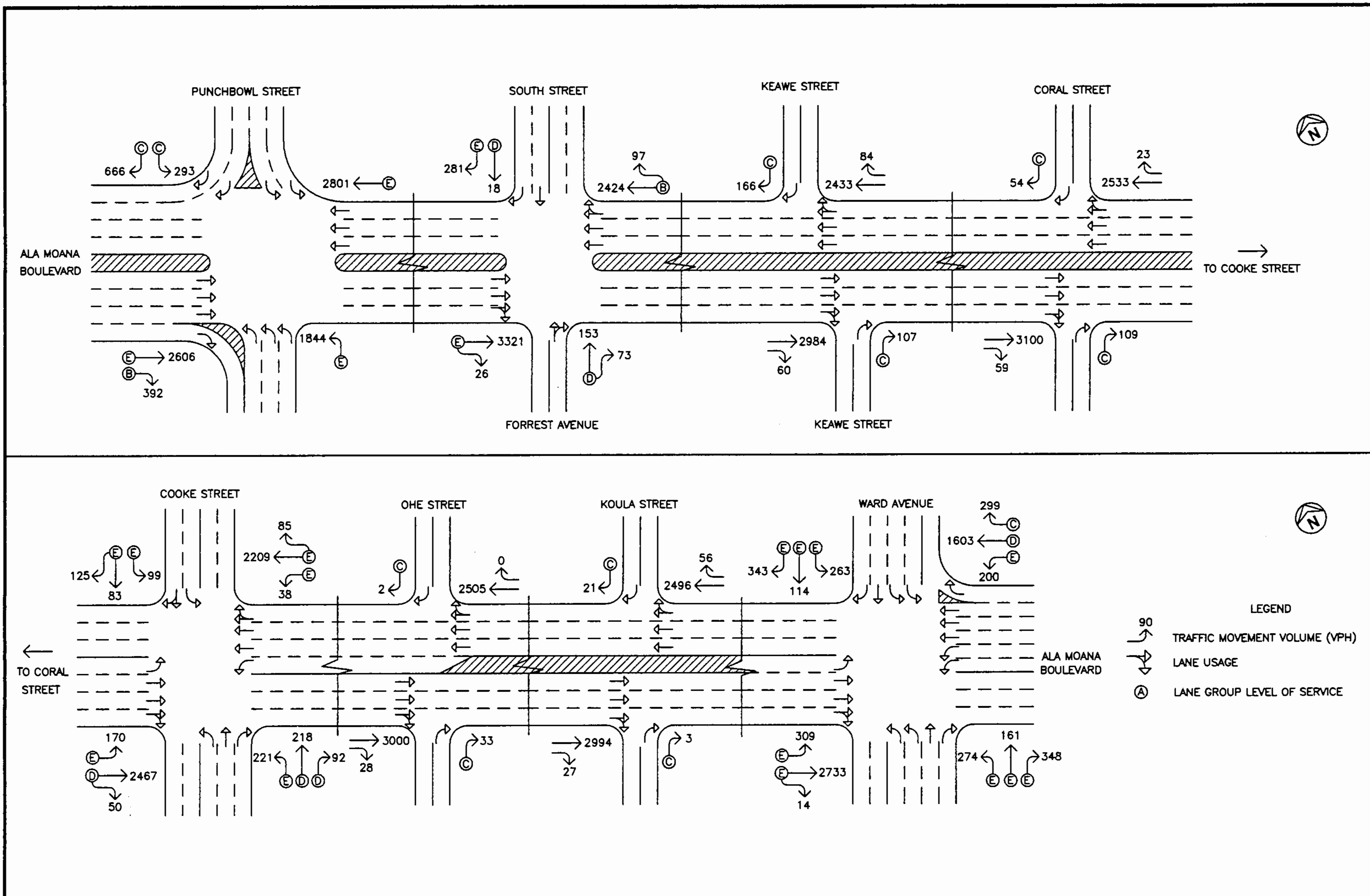
YEAR 2025 AM PEAK HOUR OF TRAFFIC WITH PROJECT
ILALO STREET

FIGURE
23



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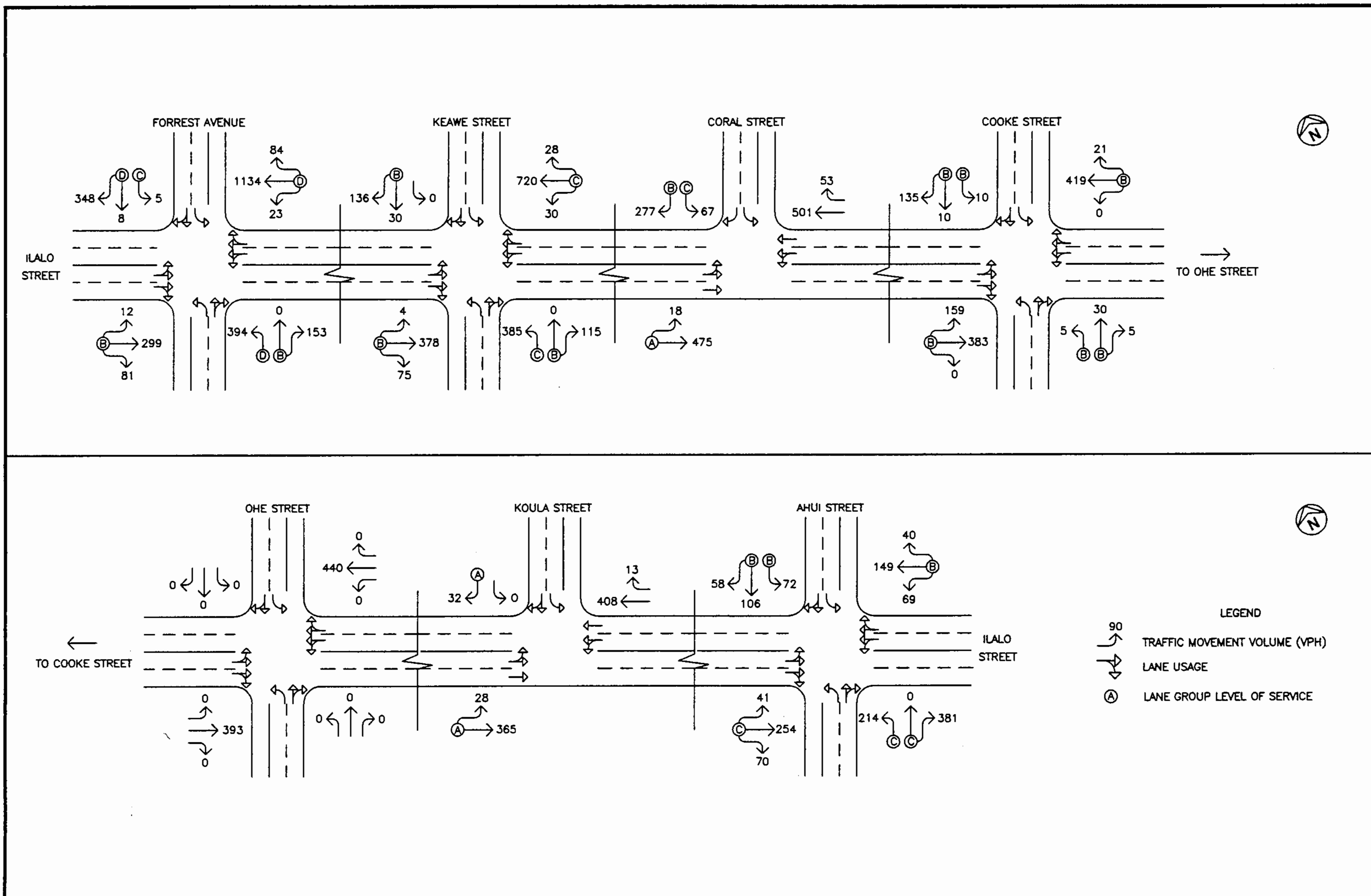
YEAR 2025 PM PEAK HOUR OF TRAFFIC WITH PROJECT
ALA MOANA BOULEVARD

FIGURE 24



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KAKAAKO COMMUNITY DEVELOPMENT DISTRICT MAKAI AREA

YEAR 2025 PM PEAK HOUR OF TRAFFIC WITH PROJECT
ILALO STREET

FIGURE
25

the Makai Area is undertaken, modifications may be required to the intersection of Ala Moana Boulevard, South Street, and Forrest Avenue. Under Year 2025 with project conditions, the eastbound, northbound, and southbound approaches of that intersection are anticipated to operate at an unacceptable LOS "F" during the PM peak period. As such, for the purpose of this report, northbound and southbound left-turn traffic movements at South Street/Forrest Avenue are assumed to be restricted by the Year 2025 and the traffic control at that intersection modified to accommodate the new lane use configuration. The projected Year 2014 traffic operating conditions are provided in Tables 13 and 14 for comparison purposes. LOS calculations are included in Appendix F.

Table 13: Projected Year 2014 and 2025 Traffic Operating Conditions Ala Moana Boulevard

Intersecting Street	Traffic Movement		AM		PM	
			Year 2014	Year 2025	Year 2014	Year 2025
Punchbowl St	Eastbound	TH	C	D	C	E
		RT	B	A	B	B
	Westbound	TH-RT	C	B	D	E
	Northbound	LT	C	D	D	E
	Southbound	LT	C	D	C	C
		RT	C	D	C	C
South St/Forrest Ave	Eastbound	TH-RT	D	D	E	E
	Westbound	TH-RT	C	B	B	B
	Northbound	LT-TH-RT	D	D	E	D
	Southbound	LT-TH	D	D	D	D
		RT	C	D	D	E
Keawe St	Northbound	RT	C	C	C	C
	Southbound	RT	B	C	C	C
Coral St	Northbound	RT	C	C	C	C
	Southbound	RT	B	B	C	C

Table 13: Projected Year 2014 and 2025 Traffic Operating Conditions Ala Moana Boulevard (Cont'd)

Intersecting Street	Traffic Movement		AM		PM	
			Year 2014	Year 2025	Year 2014	Year 2025
Cooke St	Eastbound	LT	E	E	E	E
		TH-RT	E	D	C	D
	Westbound	LT	E	E	E	E
		TH-RT	E	E	E	E
	Northbound	LT	E	E	E	E
		TH	D	D	D	D
		RT	D	D	D	D
	Southbound	LT-TH	E	E	E	E
		RT	E	E	E	E
Ohe St	Northbound	RT	C	C	C	C
	Southbound	RT	C	C	C	C
Koula St	Northbound	RT	B	B	C	C
	Southbound	RT	B	B	B	C
Ward Ave	Eastbound	LT	E	E	E	E
		TH-RT	D	E	E	E
	Westbound	LT	E	E	E	E
		TH	E	E	D	D
		RT	C	C	C	C
	Northbound	LT	E	E	E	E
		TH	E	E	E	E
		RT	E	E	E	E
	Southbound	LT	E	E	E	E
		TH	E	E	E	E
		RT	E	E	E	E

Table 14: Projected Year 2014 and 2025 Traffic Operating Conditions
Ilalo Street

Intersecting Street	Traffic Movement		AM		PM	
			Year 2014	Year 2025	Year 2014	Year 2025
Forrest Ave	Eastbound	LT-TH-RT	B	B	B	B
	Westbound	LT-TH-RT	B	B	C	D
	Northbound	LT	C	C	C	D
		TH-RT	C	C	B	B
Forrest Ave (Cont'd)	Southbound	LT	C	C	C	C
		TH-RT	C	C	C	D
Keawe St	Eastbound	LT-TH-RT	B	B	B	B
	Westbound	LT-TH-RT	B	B	C	C
	Northbound	LT	B	B	C	C
		TH-RT	B	B	B	B
	Southbound	LT	B	B	B	B
		TH-RT	B	B	B	B
Coral St	Eastbound	LT-TH	A	B	A	A
	Southbound	LT	C	C	C	C
		RT	B	B	B	B
Cooke St	Eastbound	LT-TH-RT	B	B	B	B
	Westbound	LT-TH-RT	B	B	B	B
	Northbound	LT	A	B	B	B
		TH-RT	A	B	B	B
	Southbound	LT	A	B	B	B
		TH-RT	B	B	B	B
Koula St	Eastbound	LT-TH	A	A	A	A
	Southbound	LT	B	C	B	B
		RT	B	B	A	A

**Table 14: Projected Year 2014 and 2025 Traffic Operating Conditions
Ilalo Street (Cont'd)**

Intersecting Street	Traffic Movement		AM		PM	
			Year 2014	Year 2025	Year 2014	Year 2025
Ahui St	Eastbound	LT-TH-RT	A	A	B	C
	Westbound	LT-TH-RT	A	B	B	B
	Northbound	LT	A	B	B	C
		TH-RT	A	A	C	C
	Southbound	LT	A	B	A	B
		TH-RT	A	A	B	B

Traffic operations along Ala Moana Boulevard are expected remain similar to or deteriorate from Year 2014 conditions due to the anticipated increases in traffic along Ala Moana Boulevard due to ambient traffic growth and development of the remainder of the Kakaako Makai Area. The traffic movements at the intersections with Punchbowl Street, South Street/Forrest Avenue, Cooke Street, and Ward Avenue are anticipated to operate at LOS "E" or better during both peak periods. At the intersections with Keawe Street, Coral Street, Ohe Street, and Koula Street, the traffic movements on the northbound and southbound approaches of those intersections are anticipated to operate at LOS "C' or better during both peak periods.

At the intersections along Ilalo Street, traffic operations are also anticipated to remain similar to or deteriorate from Year 2009 conditions due to the increase in site-generated traffic from Lots 10, 13, 21, 22, and 23 along that roadway. The traffic movements at the intersection with Cooke Street are anticipated to operate at LOS "B" or better during both peak periods while those at the intersections with Coral Street, Koula Street, and Ahui Street are anticipated to operate at LOS "C" or better during both peak periods. At the intersections with Forrest Avenue and Keawe Street, traffic operations are anticipated to operate at LOS "C" or better during both peak periods due to the installation of traffic signal systems at those intersections.

D. Recommendations for Year 2025

Based on the analysis of the traffic data and the preliminary development schedule, the following are the recommendations of this study for the Year 2025:

1. Maintain adequate turning radii at all roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.

2. Maintain adequate sight distances for motorists to safely enter and exit all roadways.

3. Prohibit northbound and southbound left-turn traffic movements at the intersection of Ala Moana Boulevard, South Street, and Forrest Avenue.

4. Reassess the traffic signal warrant studies previously conducted for the intersection along Ilalo Street where traffic signal systems were not warranted in the Year 2014. Install traffic signal systems where warranted.

VII. CONCLUSION

The Kakaako Community Development District Makai Area encompasses approximately 221 acres and extends Makai of Ala Moana Boulevard between Ala Moana Park and Aloha Tower. The Kakaako Makai Area Plan sets forth the development objectives and rationale for the orderly redevelopment of the area and the current plan allows for a mix of commercial, waterfront commercial, public, and maritime industrial uses. The Hawaii Community Development Authority (HCDA) is proposing to amend the Makai Area Plan and Rules to allow residential use in the Kakaako Makai Area. A Mixed-Use zoning district (MUZ) will be established where residential, commercial and public uses will be allowed. Residential use will also be allowed in the present Waterfront Commercial zone. The Kakaako Makai Area is envisioned to be developed as a walkable, mixed-use community where people can live, work, shop, and play. In addition to private automobiles, the multi-modal transportation system serving the Makai Area will include inter-connected pedestrian pathways, bikeways, and the City's transit system.

A development schedule for the implementation of the proposed Makai Area Plan was prepared with the assistance of the HCDA which provides target dates for development of selected parcels in the Makai Area. Over the span of approximately 20 years, the project area is expected to be transformed to include almost 2,700,000 square feet of office and commercial floor area, as well as, approximately 1,060 residential units. To accommodate the expected increases in traffic within the project area due to this development and ambient growth in traffic, significant modifications need to be made to the existing infrastructure and traffic management in the project vicinity. These modifications include increasing the capacity of several key intersections along Ala Moana Boulevard, as well as, reducing the disruptions in traffic flow along that roadway. In addition, increased capacity will also be required along Ilalo Street, as well as, the installation of traffic signal systems at key intersections along its length.

APPENDIX A

EXISTING TRAFFIC COUNT DATA

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Counter: T-1841/T-1839
Counted By: GMT/IQ
Weather: Clear

File Name : alapuna
Site Code : 00000001
Start Date : 11/9/2004
Page No : 1

Groups Printed- Unshifted

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Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
05:30 AM	26	0	12	38	0	137	0	137	0	0	0	0	0	215	0	215	390
05:45 AM	35	0	29	64	0	161	0	161	0	0	0	0	0	292	0	292	517
Total	61	0	41	102	0	298	0	298	0	0	0	0	0	507	0	507	907
06:00 AM	39	0	27	66	0	225	0	225	0	0	0	0	0	347	0	347	638
06:15 AM	32	0	41	73	0	248	0	248	0	0	0	0	0	450	0	450	771
06:30 AM	44	0	28	72	0	288	0	288	0	0	0	0	0	509	0	509	869
06:45 AM	43	0	33	76	0	409	0	409	0	0	0	0	0	490	0	490	975
Total	158	0	129	287	0	1170	0	1170	0	0	0	0	0	1796	0	1796	3253
07:00 AM	37	0	57	94	0	420	0	420	0	0	0	0	0	593	0	593	1107
07:15 AM	42	0	66	108	1	525	0	526	0	0	0	0	0	595	0	595	1229
07:30 AM	48	0	85	133	0	509	0	509	0	0	0	0	0	688	0	688	1330
07:45 AM	31	0	86	117	0	525	0	525	0	0	0	0	0	743	0	743	1385
Total	158	0	294	452	1	1979	0	1980	0	0	0	0	0	2619	0	2619	5051
08:00 AM	54	0	73	127	0	527	0	527	0	0	0	0	0	634	0	634	1288
08:15 AM	45	0	77	122	0	433	0	433	0	0	0	0	0	620	0	620	1175
Grand Total	476	0	614	1090	1	4407	0	4408	0	0	0	0	0	6176	0	6176	11674
Apprch %	43.7	0.0	56.3		0.0	100.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	4.1	0.0	5.3	9.3	0.0	37.8	0.0	37.8	0.0	0.0	0.0	0.0	0.0	52.9	0.0	52.9	

	Punchbowl St Southbound				Ala Moana Blvd Westbound				Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 05:30 AM to 08:15 AM - Peak 1 of 1																	
Intersection	07:15 AM																
Volume	175	0	310	485	1	2086	0	2087	0	0	0	0	0	2660	0	2660	5232
Percent	36.1	0.0	63.9		0.0	100.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
07:45 Volume	31	0	86	117	0	525	0	525	0	0	0	0	0	743	0	743	1385
Peak Factor																	0.944
High Int.	07:30 AM				08:00 AM				5:15:00 AM				07:45 AM				
Volume	48	0	85	133	0	527	0	527	0	0	0	0	0	743	0	743	
Peak Factor				0.912				0.990								0.895	

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Counter: T-1841/T-1839
Counted By: GMT/IQ
Weather: Clear

File Name : alapunp
Site Code : 00000001
Start Date : 11/9/2004
Page No : 1

Groups Printed- Unshifted

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Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
03:30 PM	52	0	113	165	0	621	0	621	0	0	0	0	0	588	0	588	1374
03:45 PM	41	0	91	132	0	638	0	638	0	0	0	0	0	516	0	516	1286
Total	93	0	204	297	0	1259	0	1259	0	0	0	0	0	1104	0	1104	2660
04:00 PM	44	0	170	214	0	618	0	618	0	0	0	0	0	564	0	564	1396
04:15 PM	36	0	115	151	0	608	0	608	0	0	0	0	0	606	0	606	1365
04:30 PM	31	0	163	194	0	556	0	556	0	0	0	0	0	672	0	672	1422
04:45 PM	41	0	155	196	0	553	0	553	0	0	0	0	0	623	0	623	1372
Total	152	0	603	755	0	2335	0	2335	0	0	0	0	0	2465	0	2465	5555
05:00 PM	42	0	131	173	0	522	0	522	0	0	0	0	0	677	0	677	1372
05:15 PM	51	0	149	200	0	539	0	539	0	0	0	0	0	635	0	635	1374
05:30 PM	42	0	100	142	0	593	0	593	0	0	0	0	0	513	0	513	1248
05:45 PM	37	0	113	150	0	557	0	557	0	0	0	0	0	420	0	420	1127
Total	172	0	493	665	0	2211	0	2211	0	0	0	0	0	2245	0	2245	5121
06:00 PM	28	0	70	98	0	515	0	515	0	0	0	0	0	444	0	444	1057
06:15 PM	31	0	64	95	0	534	0	534	0	0	0	0	0	388	0	388	1017
Grand Total	476	0	1434	1910	0	6854	0	6854	0	0	0	0	0	6646	0	6646	15410
Apprch %	24.9	0.0	75.1		0.0	100.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
Total %	3.1	0.0	9.3	12.4	0.0	44.5	0.0	44.5	0.0	0.0	0.0	0.0	0.0	43.1	0.0	43.1	

	Punchbowl St Southbound				Ala Moana Blvd Westbound				Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 03:30 PM to 06:15 PM - Peak 1 of 1																	
Intersection	04:00 PM																
Volume	152	0	603	755	0	2335	0	2335	0	0	0	0	0	2465	0	2465	5555
Percent	20.1	0.0	79.9		0.0	100.0	0.0		0.0	0.0	0.0		0.0	100.0	0.0		
04:30 Volume	31	0	163	194	0	556	0	556	0	0	0	0	0	672	0	672	1422
Peak Factor																	0.977
High Int.	04:00 PM				04:00 PM				3:15:00 PM				04:30 PM				
Volume	44	0	170	214	0	618	0	618	0	0	0	0	0	672	0	672	
Peak Factor				0.882				0.945								0.917	

Wilson Okamoto Corporation
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Honolulu, HI 96826

Counter: D1-0768 / D1-0527
Counted By: KT / GM
Weather: Clear

File Name : alasoua
Site Code : 00000002
Start Date : 11/9/2004
Page No : 1

Groups Printed- 1 - Unshifted

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Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
05:30 AM	1	2	1	4	0	145	1	146	5	6	0	11	21	202	25	248	409
05:45 AM	2	1	2	5	0	153	8	161	3	2	0	5	19	277	22	318	489
Total	3	3	3	9	0	298	9	307	8	8	0	16	40	479	47	566	898
06:00 AM	0	3	4	7	0	225	7	232	5	0	1	6	22	312	32	366	611
06:15 AM	2	5	6	13	0	235	10	245	9	1	1	11	30	428	38	496	765
06:30 AM	2	3	10	15	0	312	22	334	5	4	0	9	50	498	35	583	941
06:45 AM	0	8	6	14	0	370	20	390	8	5	0	13	78	556	25	659	1076
Total	4	19	26	49	0	1142	59	1201	27	10	2	39	180	1794	130	2104	3393
07:00 AM	3	4	9	16	0	397	30	427	14	4	0	18	68	587	28	683	1144
07:15 AM	0	7	11	18	0	477	35	512	9	6	0	15	64	585	19	668	1213
07:30 AM	3	4	5	12	0	485	41	526	12	10	0	22	71	653	14	738	1298
07:45 AM	4	3	12	19	0	508	30	538	8	6	0	14	65	671	5	741	1312
Total	10	18	37	65	0	1867	136	2003	43	26	0	69	268	2496	66	2830	4967
08:00 AM	0	1	13	14	0	423	39	462	17	6	0	23	66	525	8	599	1098
08:15 AM	1	5	20	26	0	345	28	373	15	16	0	31	62	552	17	631	1061
Grand Total	18	46	99	163	0	4075	271	4346	110	66	2	178	616	5846	268	6730	11417
Apprch %	11.0	28.2	60.7		0.0	93.8	6.2		61.8	37.1	1.1		9.2	86.9	4.0		
Total %	0.2	0.4	0.9	1.4	0.0	35.7	2.4	38.1	1.0	0.6	0.0	1.6	5.4	51.2	2.3	58.9	

	South Street Southbound				Ala Moana Boulevard Westbound				South Street Northbound				Ala Moana Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 05:30 AM to 08:15 AM - Peak 1 of 1																	
Intersection	07:00 AM																
Volume	10	18	37	65	0	1867	136	2003	43	26	0	69	268	2496	66	2830	4967
Percent	15.4	27.7	56.9		0.0	93.2	6.8		62.3	37.7	0.0		9.5	88.2	2.3		
07:45 Volume	4	3	12	19	0	508	30	538	8	6	0	14	65	671	5	741	1312
Peak Factor																	0.946
High Int.	07:45 AM				07:45 AM				07:30 AM				07:45 AM				
Volume	4	3	12	19	0	508	30	538	12	10	0	22	65	671	5	741	
Peak Factor				0.855				0.931				0.784				0.955	

Wilson Okamoto Corporation
1907 S. Beretania St. Suite 400
Honolulu, HI 96826

Counter: D1-0768 / D1-0527
Counted By: KT / GM
Weather: Clear

File Name : alasoup
Site Code : 00000002
Start Date : 11/9/2004
Page No : 1

Groups Printed- 1 - Unshifted

	Southbound				Westbound				Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
03:30 PM	6	0	46	52	0	486	26	512	57	20	0	77	59	614	13	686	1327
03:45 PM	4	2	41	47	0	560	22	582	33	11	0	44	51	575	2	628	1301
Total	10	2	87	99	0	1046	48	1094	90	31	0	121	110	1189	15	1314	2628
04:00 PM	9	0	71	80	0	505	19	524	31	19	0	50	49	638	0	687	1341
04:15 PM	4	0	41	45	0	551	22	573	25	8	0	33	51	623	0	674	1325
04:30 PM	12	0	72	84	0	456	26	482	29	15	0	44	59	589	6	654	1264
04:45 PM	1	0	52	53	0	484	12	496	27	9	0	36	61	681	0	742	1327
Total	26	0	236	262	0	1996	79	2075	112	51	0	163	220	2531	6	2757	5257
05:00 PM	11	0	59	70	0	489	25	514	18	12	0	30	53	691	0	744	1358
05:15 PM	21	0	71	92	0	475	25	500	16	18	0	34	51	831	0	882	1508
05:30 PM	14	0	26	40	0	541	21	562	24	6	0	30	46	561	3	610	1242
05:45 PM	12	0	21	33	0	525	31	556	19	2	0	21	50	385	0	435	1045
Total	58	0	177	235	0	2030	102	2132	77	38	0	115	200	2468	3	2671	5153
06:00 PM	0	0	18	18	0	513	27	540	6	7	0	13	22	422	0	444	1015
06:15 PM	8	1	32	41	0	481	20	501	5	8	0	13	34	350	1	385	940
Grand Total	102	3	550	655	0	6066	276	6342	290	135	0	425	586	6960	25	7571	14993
Apprch %	15.6	0.5	84.0		0.0	95.6	4.4		68.2	31.8	0.0		7.7	91.9	0.3		
Total %	0.7	0.0	3.7	4.4	0.0	40.5	1.8	42.3	1.9	0.9	0.0	2.8	3.9	46.4	0.2	50.5	

	Southbound				Westbound				Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 03:30 PM to 06:15 PM - Peak 1 of 1																	
Intersection	04:30 PM																
Volume	45	0	254	299	0	1904	88	1992	90	54	0	144	224	2792	6	3022	5457
Percent	15.1	0.0	84.9		0.0	95.6	4.4		62.5	37.5	0.0		7.4	92.4	0.2		
05:15 Volume	21	0	71	92	0	475	25	500	16	18	0	34	51	831	0	882	1508
Peak Factor																	0.905
High Int.	05:15 PM				05:00 PM				04:30 PM				05:15 PM				
Volume	21	0	71	92	0	489	25	514	29	15	0	44	51	831	0	882	
Peak Factor				0.813				0.969				0.818				0.857	

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
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Counter: D1-0769/D1-0525
Counted By: TO/JG
Weather: Clear

File Name : alakeaa
Site Code : 00000003
Start Date : 11/9/2004
Page No : 1

Groups Printed- 1 - Unshifted

	Keawe St Southbound				Ala Moana Blvd Westbound				Keawe St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
05:30 AM	0	0	4	4	1	133	5	139	0	0	0	0	0	180	8	188	331
05:45 AM	1	1	4	6	0	158	2	160	1	0	0	1	8	247	9	264	431
Total	1	1	8	10	1	291	7	299	1	0	0	1	8	427	17	452	762
06:00 AM	1	0	2	3	3	225	5	233	1	0	0	1	4	271	12	287	524
06:15 AM	2	2	3	7	4	236	4	244	1	0	0	1	8	412	13	433	685
06:30 AM	1	2	6	9	5	300	2	307	3	0	1	4	11	455	13	479	799
06:45 AM	1	0	4	5	2	399	7	408	7	1	3	11	11	510	6	527	951
Total	5	4	15	24	14	1160	18	1192	12	1	4	17	34	1648	44	1726	2959
07:00 AM	2	0	5	7	3	447	9	459	1	0	0	1	19	546	5	570	1037
07:15 AM	1	1	6	8	2	504	10	516	1	1	1	3	27	526	8	561	1088
07:30 AM	2	1	11	14	0	540	9	549	3	1	1	5	37	585	5	627	1195
07:45 AM	5	0	15	20	1	483	12	496	4	4	2	10	35	567	14	616	1142
Total	10	2	37	49	6	1974	40	2020	9	6	4	19	118	2224	32	2374	4462
08:00 AM	7	4	21	32	0	512	15	527	4	1	2	7	43	530	7	580	1146
08:15 AM	2	3	9	14	2	389	9	400	9	0	2	11	28	518	10	556	981
Grand Total	25	14	90	129	23	4326	89	4438	35	8	12	55	231	5347	110	5688	10310
Apprch %	19.4	10.9	69.8		0.5	97.5	2.0		63.6	14.5	21.8		4.1	94.0	1.9		
Total %	0.2	0.1	0.9	1.3	0.2	42.0	0.9	43.0	0.3	0.1	0.1	0.5	2.2	51.9	1.1	55.2	

	Keawe St Southbound				Ala Moana Blvd Westbound				Keawe St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 05:30 AM to 08:15 AM - Peak 1 of 1																	
Intersection	07:15 AM																
Volume	15	6	53	74	3	2039	46	2088	12	7	6	25	142	2208	34	2384	4571
Percent	20.3	8.1	71.6		0.1	97.7	2.2		48.0	28.0	24.0		6.0	92.6	1.4		
07:30 Volume	2	1	11	14	0	540	9	549	3	1	1	5	37	585	5	627	1195
Peak Factor																	0.956
High Int.	08:00 AM				07:30 AM				07:45 AM				07:30 AM				
Volume	7	4	21	32	0	540	9	549	4	4	2	10	37	585	5	627	
Peak Factor				0.578				0.951				0.625				0.951	

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Counter: D1-0769/D1-0525
Counted By: TO/JG
Weather: Clear

File Name : alakeap
Site Code : 00000003
Start Date : 11/9/2004
Page No : 1

Groups Printed- 1 - Unshifted

	Keawe St Southbound				Ala Moana Blvd Westbound				Keawe St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
03:30 PM	14	1	16	31	0	462	18	480	6	6	4	16	7	461	0	468	995
03:45 PM	8	0	23	31	0	545	16	561	16	5	3	24	5	531	6	542	1158
Total	22	1	39	62	0	1007	34	1041	22	11	7	40	12	992	6	1010	2153
04:00 PM	12	0	26	38	0	496	14	510	23	2	3	28	13	539	5	557	1133
04:15 PM	7	1	26	34	0	552	13	565	7	1	1	9	9	599	3	611	1219
04:30 PM	12	0	50	62	0	431	20	451	20	2	2	24	14	593	1	608	1145
04:45 PM	10	0	32	42	0	411	30	441	16	8	1	25	12	626	6	644	1152
Total	41	1	134	176	0	1890	77	1967	66	13	7	86	48	2357	15	2420	4649
05:00 PM	10	0	42	52	0	461	13	474	14	2	2	18	10	638	9	657	1201
05:15 PM	9	0	33	42	0	427	9	436	5	3	1	9	9	641	9	659	1146
05:30 PM	8	1	30	39	0	511	14	525	6	2	3	11	3	571	1	575	1150
05:45 PM	17	0	21	38	0	515	18	533	10	0	1	11	13	408	2	423	1005
Total	44	1	126	171	0	1914	54	1968	35	7	7	49	35	2258	21	2314	4502
06:00 PM	12	0	17	29	0	471	18	489	6	0	1	7	5	421	4	430	955
06:15 PM	7	0	12	19	1	451	16	468	5	0	0	5	3	369	1	373	865
Grand Total	126	3	328	457	1	5733	199	5933	134	31	22	187	103	6397	47	6547	13124
Apprch %	27.6	0.7	71.8		0.0	96.6	3.4		71.7	16.6	11.8		1.6	97.7	0.7		
Total %	1.0	0.0	2.5	3.5	0.0	43.7	1.5	45.2	1.0	0.2	0.2	1.4	0.8	48.7	0.4	49.9	

	Keawe St Southbound				Ala Moana Blvd Westbound				Keawe St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 03:30 PM to 06:15 PM - Peak 1 of 1																	
Intersection	04:15 PM																
Volume	39	1	150	190	0	1855	76	1931	57	13	6	76	45	2456	19	2520	4717
Percent	20.5	0.5	78.9		0.0	96.1	3.9		75.0	17.1	7.9		1.8	97.5	0.8		
04:15 Volume	7	1	26	34	0	552	13	565	7	1	1	9	9	599	3	611	1219
Peak Factor																	0.967
High Int.	04:30 PM				04:15 PM				04:45 PM				05:00 PM				
Volume	12	0	50	62	0	552	13	565	16	8	1	25	10	638	9	657	
Peak Factor				0.766				0.854				0.760				0.959	

Wilson Okamoto Corporation
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Counter: D1-0526/D1-0528
Counted By: MAF/FS
Weather: Clear

File Name : alacora
Site Code : 00000004
Start Date : 11/9/2004
Page No : 1

Groups Printed- 1 - Unshifted

	Coral St Southbound				Ala Moana Blvd Westbound				Coral St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
05:30 AM	0	1	0	1	0	139	0	139	0	0	0	0	1	168	8	177	317
05:45 AM	1	3	0	4	1	170	0	171	1	0	0	1	3	236	14	253	429
Total	1	4	0	5	1	309	0	310	1	0	0	1	4	404	22	430	746
06:00 AM	0	5	3	8	3	234	1	238	1	0	0	1	4	255	12	271	518
06:15 AM	1	7	0	8	3	232	1	236	1	1	0	2	2	399	7	408	654
06:30 AM	3	13	2	18	3	342	2	347	1	0	0	1	5	441	13	459	825
06:45 AM	0	5	1	6	8	403	4	415	3	1	0	4	7	496	17	520	945
Total	4	30	6	40	17	1211	8	1236	6	2	0	8	18	1591	49	1658	2942
07:00 AM	5	2	3	10	7	445	3	455	4	0	0	4	4	501	24	529	998
07:15 AM	5	6	5	16	9	516	6	531	2	0	0	2	11	494	18	523	1072
07:30 AM	5	9	7	21	12	546	9	567	2	2	0	4	10	527	24	561	1153
07:45 AM	7	14	2	23	12	511	8	531	2	4	2	8	23	532	27	582	1144
Total	22	31	17	70	40	2018	26	2084	10	6	2	18	48	2054	93	2195	4367
08:00 AM	1	3	8	12	13	510	7	530	2	2	3	7	21	529	24	574	1123
08:15 AM	2	8	3	13	15	402	8	425	6	2	2	10	6	507	26	539	987
Grand Total	30	76	34	140	86	4450	49	4585	25	12	7	44	97	5085	214	5396	10165
Apprch %	21.4	54.3	24.3		1.9	97.1	1.1		56.8	27.3	15.9		1.8	94.2	4.0		
Total %	0.3	0.7	0.3	1.4	0.8	43.8	0.5	45.1	0.2	0.1	0.1	0.4	1.0	50.0	2.1	53.1	

	Coral St Southbound				Ala Moana Blvd Westbound				Coral St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 05:30 AM to 08:15 AM - Peak 1 of 1																	
Intersection	07:15 AM																
Volume	18	32	22	72	46	2083	30	2159	8	8	5	21	65	2082	93	2240	4492
Percent	25.0	44.4	30.6		2.1	96.5	1.4		38.1	38.1	23.8		2.9	92.9	4.2		
07:30 Volume	5	9	7	21	12	546	9	567	2	2	0	4	10	527	24	561	1153
Peak Factor																	0.974
High Int.	07:45 AM				07:30 AM				07:45 AM				07:45 AM				
Volume	7	14	2	23	12	546	9	567	2	4	2	8	23	532	27	582	
Peak Factor				0.783				0.952				0.656				0.962	

Wilson Okamoto Corporation
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Honolulu, HI 96826

Counter: D1-0526/D1-0528
Counted By: MAF/FS
Weather: Clear

File Name : alacorp
Site Code : 00000004
Start Date : 11/9/2004
Page No : 1

Groups Printed- 1 - Unshifted

	Coral St Southbound				Ala Moana Blvd Westbound				Coral St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
03:30 PM	10	8	12	30	8	476	9	493	11	14	6	31	13	536	7	556	1110
03:45 PM	5	6	8	19	4	517	4	525	11	6	13	30	5	554	4	563	1137
Total	15	14	20	49	12	993	13	1018	22	20	19	61	18	1090	11	1119	2247
04:00 PM	6	1	12	19	2	481	6	489	28	17	11	56	11	549	9	569	1133
04:15 PM	4	6	11	21	2	567	6	575	14	12	6	32	7	600	8	615	1243
04:30 PM	6	4	13	23	2	434	6	442	9	9	4	22	9	620	5	634	1121
04:45 PM	4	7	11	22	1	448	6	455	8	11	18	37	3	616	7	626	1140
Total	20	18	47	85	7	1930	24	1961	59	49	39	147	30	2385	29	2444	4637
05:00 PM	1	5	14	20	5	445	3	453	21	10	13	44	9	670	9	688	1205
05:15 PM	7	2	8	17	2	447	5	454	13	11	12	36	5	616	5	626	1133
05:30 PM	3	2	13	18	2	499	10	511	11	14	16	41	3	588	6	597	1167
05:45 PM	3	1	9	13	2	540	8	550	10	8	5	23	4	429	5	438	1024
Total	14	10	44	68	11	1931	26	1968	55	43	46	144	21	2303	25	2349	4529
06:00 PM	3	0	16	19	0	460	5	465	14	8	3	25	4	433	4	441	950
06:15 PM	1	3	11	15	0	460	8	468	8	4	7	19	1	401	4	406	908
Grand Total	53	45	138	236	30	5774	76	5880	158	124	114	396	74	6612	73	6759	13271
Apprch %	22.5	19.1	58.5		0.5	98.2	1.3		39.9	31.3	28.8		1.1	97.8	1.1		
Total %	0.4	0.3	1.0	1.8	0.2	43.5	0.6	44.3	1.2	0.9	0.9	3.0	0.6	49.8	0.6	50.9	

	Coral St Southbound				Ala Moana Blvd Westbound				Coral St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 03:30 PM to 06:15 PM - Peak 1 of 1																	
Intersection	04:15 PM																
Volume	15	22	49	86	10	1894	21	1925	52	42	41	135	28	2506	29	2563	4709
Percent	17.4	25.6	57.0		0.5	98.4	1.1		38.5	31.1	30.4		1.1	97.8	1.1		
04:15 Volume	4	6	11	21	2	567	6	575	14	12	6	32	7	600	8	615	1243
Peak Factor																	0.947
High Int.	04:30 PM				04:15 PM				05:00 PM				05:00 PM				
Volume	6	4	13	23	2	567	6	575	21	10	13	44	9	670	9	688	
Peak Factor				0.935				0.837				0.767				0.931	

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1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Counter: D1-0769/D1-0525
Counted By: TO/JG
Weather: Clear

File Name : alaohea
Site Code : 00000007
Start Date : 11/10/2004
Page No : 1

Groups Printed- 1 - Unshifted

	Ohe St Southbound				Ala Moana Blvd Westbound				Ohe St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
05:30 AM	0	1	0	1	0	134	0	134	0	0	0	0	0	161	0	161	296
05:45 AM	0	0	0	0	0	167	0	167	0	0	1	1	0	237	5	242	410
Total	0	1	0	1	0	301	0	301	0	0	1	1	0	398	5	403	706
06:00 AM	0	0	0	0	0	209	0	209	0	0	0	0	1	284	4	289	498
06:15 AM	0	0	2	2	0	263	0	263	0	0	0	0	0	340	6	346	611
06:30 AM	0	0	0	0	0	372	0	372	0	0	0	0	0	466	4	470	842
06:45 AM	0	0	1	1	0	351	0	351	0	0	0	0	0	469	8	477	829
Total	0	0	3	3	0	1195	0	1195	0	0	0	0	1	1559	22	1582	2780
07:00 AM	0	0	0	0	0	529	0	529	0	0	0	0	0	458	8	466	995
07:15 AM	0	0	0	0	0	526	0	526	0	0	1	1	0	532	5	537	1064
07:30 AM	0	0	1	1	0	517	0	517	0	0	0	0	0	560	5	565	1083
07:45 AM	0	0	3	3	0	562	0	562	0	0	1	1	0	549	4	553	1119
Total	0	0	4	4	0	2134	0	2134	0	0	2	2	0	2099	22	2121	4261
08:00 AM	0	0	0	0	0	503	0	503	0	0	3	3	0	465	2	467	973
08:15 AM	0	0	0	0	0	497	0	497	0	0	2	2	0	565	2	567	1066
Grand Total	0	1	7	8	0	4630	0	4630	0	0	8	8	1	5086	53	5140	9786
Apprch %	0.0	12.5	87.5		0.0	100.0	0.0		0.0	0.0	100.0		0.0	98.9	1.0		
Total %	0.0	0.0	0.1	0.1	0.0	47.3	0.0	47.3	0.0	0.0	0.1	0.1	0.0	52.0	0.5	52.5	

	Ohe St Southbound				Ala Moana Blvd Westbound				Ohe St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 05:30 AM to 08:15 AM - Peak 1 of 1																	
Intersection	07:00 AM																
Volume	0	0	4	4	0	2134	0	2134	0	0	2	2	0	2099	22	2121	4261
Percent	0.0	0.0	100.0		0.0	100.0	0.0		0.0	0.0	100.0		0.0	99.0	1.0		
07:45 Volume	0	0	3	3	0	562	0	562	0	0	1	1	0	549	4	553	1119
Peak Factor																	0.952
High Int.	07:45 AM				07:45 AM				07:15 AM				07:30 AM				
Volume	0	0	3	3	0	562	0	562	0	0	1	1	0	560	5	565	
Peak Factor				0.333				0.949				0.500				0.938	

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Counter: D1-0769/D1-0525
Counted By: TO/JG
Weather: Clear

File Name : alaohep
Site Code : 00000007
Start Date : 11/10/2004
Page No : 1

Groups Printed- Unshifted

	Ohe St Southbound				Ala Moana Blvd Westbound				Ohe St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
03:30 PM	0	0	0	0	0	516	0	516	0	0	9	9	0	558	5	563	1088
03:45 PM	0	0	2	2	0	542	0	542	0	0	9	9	0	593	7	600	1153
Total	0	0	2	2	0	1058	0	1058	0	0	18	18	0	1151	12	1163	2241
04:00 PM	0	0	0	0	0	449	0	449	0	0	8	8	0	585	9	594	1051
04:15 PM	0	0	0	0	0	522	0	522	0	0	4	4	0	604	4	608	1134
04:30 PM	0	0	0	0	0	412	0	412	0	0	5	5	0	625	2	627	1044
04:45 PM	0	0	0	0	0	390	0	390	0	0	3	3	0	611	5	616	1009
Total	0	0	0	0	0	1773	0	1773	0	0	20	20	0	2425	20	2445	4238
05:00 PM	0	0	0	0	0	405	0	405	0	0	5	5	0	617	3	620	1030
05:15 PM	0	0	0	0	0	416	0	416	0	0	0	0	0	641	5	646	1062
05:30 PM	0	0	0	0	0	424	0	424	0	0	5	5	0	667	4	671	1100
05:45 PM	0	0	0	0	0	495	0	495	0	0	2	2	0	628	5	633	1130
Total	0	0	0	0	0	1740	0	1740	0	0	12	12	0	2553	17	2570	4322
06:00 PM	0	0	0	0	0	452	0	452	0	0	4	4	0	580	1	581	1037
06:15 PM	0	0	0	0	0	492	0	492	0	0	8	8	0	459	4	463	963
Grand Total	0	0	2	2	0	5515	0	5515	0	0	62	62	0	7168	54	7222	12801
Apprch %	0.0	0.0	100.0		0.0	100.0	0.0		0.0	0.0	100.0		0.0	99.3	0.7		
Total %	0.0	0.0	0.0	0.0	0.0	43.1	0.0	43.1	0.0	0.0	0.5	0.5	0.0	56.0	0.4	56.4	

	Ohe St Southbound				Ala Moana Blvd Westbound				Ohe St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 03:30 PM to 06:15 PM - Peak 1 of 1																	
Intersection	03:30 PM																
Volume	0	0	2	2	0	2029	0	2029	0	0	30	30	0	2340	25	2365	4426
Percent	0.0	0.0	100.0		0.0	100.0	0.0		0.0	0.0	100.0		0.0	98.9	1.1		
03:45 Volume	0	0	2	2	0	542	0	542	0	0	9	9	0	593	7	600	1153
Peak Factor																	0.960
High Int.	03:45 PM				03:45 PM				03:30 PM				04:15 PM				
Volume	0	0	2	2	0	542	0	542	0	0	9	9	0	604	4	608	
Peak Factor				0.250				0.936				0.833				0.972	

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Counter: D1-0768/D1-0528
Counted By: KT/FS
Weather: Clear

File Name : alakoua
Site Code : 00000006
Start Date : 11/10/2004
Page No : 1

Groups Printed- 1 - Unshifted

	Koula St Southbound				Ala Moana Blvd Westbound				Koula St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
05:30 AM	0	0	0	0	1	137	0	138	2	1	2	5	0	158	4	162	305
05:45 AM	1	0	0	1	2	168	1	171	1	0	0	1	1	189	7	197	370
Total	1	0	0	1	3	305	1	309	3	1	2	6	1	347	11	359	675
06:00 AM	0	0	1	1	2	214	1	217	0	0	2	2	1	249	10	260	480
06:15 AM	0	2	0	2	3	264	1	268	0	0	0	0	6	310	5	321	591
06:30 AM	2	0	1	3	2	364	4	370	1	0	0	1	2	402	8	412	786
06:45 AM	1	4	0	5	7	346	4	357	1	0	0	1	4	441	11	456	819
Total	3	6	2	11	14	1188	10	1212	2	0	2	4	13	1402	34	1449	2676
07:00 AM	2	4	1	7	4	531	4	539	2	0	3	5	4	479	2	485	1036
07:15 AM	5	3	5	13	9	527	2	538	4	1	1	6	8	451	4	463	1020
07:30 AM	0	0	3	3	6	501	4	511	2	2	1	5	4	518	4	526	1045
07:45 AM	2	2	5	9	5	542	4	551	2	0	1	3	6	478	4	488	1051
Total	9	9	14	32	24	2101	14	2139	10	3	6	19	22	1926	14	1962	4152
08:00 AM	3	2	1	6	9	502	2	513	3	1	1	5	4	474	0	478	1002
08:15 AM	1	2	2	5	9	502	9	520	4	0	0	4	8	501	2	511	1040
Grand Total	17	19	19	55	59	4598	36	4693	22	5	11	38	48	4650	61	4759	9545
Apprch %	30.9	34.5	34.5		1.3	98.0	0.8		57.9	13.2	28.9		1.0	97.7	1.3		
Total %	0.2	0.2	0.2	0.6	0.6	48.2	0.4	49.2	0.2	0.1	0.1	0.4	0.5	48.7	0.6	49.9	

	Koula St Southbound				Ala Moana Blvd Westbound				Koula St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 05:30 AM to 08:15 AM - Peak 1 of 1																	
Intersection	07:00 AM																
Volume	9	9	14	32	24	2101	14	2139	10	3	6	19	22	1926	14	1962	4152
Percent	28.1	28.1	43.8		1.1	98.2	0.7		52.6	15.8	31.6		1.1	98.2	0.7		
07:45 Volume	2	2	5	9	5	542	4	551	2	0	1	3	6	478	4	488	1051
Peak Factor																	0.988
High Int.	07:15 AM				07:45 AM				07:15 AM				07:30 AM				
Volume	5	3	5	13	5	542	4	551	4	1	1	6	4	518	4	526	
Peak Factor				0.615				0.971				0.792				0.933	

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Counter: D1-0768/D1-0528
Counted By: KT/JG
Weather: Clear

File Name : alakoup
Site Code : 00000006
Start Date : 11/10/2004
Page No : 1

Groups Printed- Unshifted

	Koula St Southbound				Ala Moana Blvd Westbound				Koula St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
03:30 PM	7	3	4	14	3	505	12	520	3	2	1	6	13	527	5	545	1085
03:45 PM	8	2	6	16	1	543	13	557	3	3	3	9	9	577	8	594	1176
Total	15	5	10	30	4	1048	25	1077	6	5	4	15	22	1104	13	1139	2261
04:00 PM	9	1	2	12	0	450	14	464	0	3	2	5	6	574	7	587	1068
04:15 PM	6	0	7	13	3	515	12	530	2	3	1	6	7	624	2	633	1182
04:30 PM	5	4	10	19	1	412	18	431	3	4	0	7	7	561	13	581	1038
04:45 PM	6	0	3	9	3	383	21	407	6	9	1	16	8	602	4	614	1046
Total	26	5	22	53	7	1760	65	1832	11	19	4	34	28	2361	26	2415	4334
05:00 PM	6	3	4	13	4	415	17	436	1	3	2	6	1	579	4	584	1039
05:15 PM	5	0	2	7	4	395	18	417	2	1	1	4	2	476	2	480	908
05:30 PM	5	1	1	7	5	445	10	460	0	3	2	5	3	576	2	581	1053
05:45 PM	1	3	10	14	7	484	8	499	2	4	2	8	2	565	0	567	1088
Total	17	7	17	41	20	1739	53	1812	5	11	7	23	8	2196	8	2212	4088
06:00 PM	6	2	0	8	5	445	6	456	6	3	4	13	2	542	2	546	1023
06:15 PM	5	1	1	7	2	487	6	495	5	2	0	7	2	406	3	411	920
Grand Total	69	20	50	139	38	5479	155	5672	33	40	19	92	62	6609	52	6723	12626
Apprch %	49.6	14.4	36.0		0.7	96.6	2.7		35.9	43.5	20.7		0.9	98.3	0.8		
Total %	0.5	0.2	0.4	1.1	0.3	43.4	1.2	44.9	0.3	0.3	0.2	0.7	0.5	52.3	0.4	53.2	

	Koula St Southbound				Ala Moana Blvd Westbound				Koula St Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 03:30 PM to 06:15 PM - Peak 1 of 1																	
Intersection	03:30 PM																
Volume	30	6	19	55	7	2013	51	2071	8	11	7	26	35	2302	22	2359	4511
Percent	54.5	10.9	34.5		0.3	97.2	2.5		30.8	42.3	26.9		1.5	97.6	0.9		
04:15 Volume	6	0	7	13	3	515	12	530	2	3	1	6	7	624	2	633	1182
Peak Factor																	0.954
High Int.	03:45 PM				03:45 PM				03:45 PM				04:15 PM				
Volume	8	2	6	16	1	543	13	557	3	3	3	9	7	624	2	633	
Peak Factor				0.859				0.930				0.722				0.932	

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Counter: T-1841/T-1839
Counted By: GMT/IQ
Weather: Clear

File Name : alawara
Site Code : 00000005
Start Date : 11/10/2004
Page No : 1

Groups Printed- Unshifted

	Ward Ave Southbound				Ala Moana Blvd Westbound				Ward Ave Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
05:30 AM	26	6	9	41	4	126	2	132	0	4	2	6	23	131	0	154	333
05:45 AM	21	19	24	64	10	144	2	156	1	7	6	14	16	172	1	189	423
Total	47	25	33	105	14	270	4	288	1	11	8	20	39	303	1	343	756
06:00 AM	34	14	17	65	3	194	7	204	3	13	2	18	24	206	1	231	518
06:15 AM	34	14	24	72	11	259	10	280	0	2	2	4	35	276	0	311	667
06:30 AM	30	17	35	82	6	337	16	358	1	7	4	12	38	374	0	412	864
06:45 AM	32	35	44	111	18	316	20	354	0	11	6	17	64	396	0	460	942
Total	130	80	120	330	38	1106	52	1196	4	33	14	51	161	1252	1	1414	2991
07:00 AM	43	23	52	118	13	510	25	548	0	8	3	11	46	405	1	452	1129
07:15 AM	46	16	54	116	14	464	29	507	1	12	6	19	57	400	0	457	1099
07:30 AM	41	24	60	125	14	455	32	501	0	12	14	26	83	474	0	557	1209
07:45 AM	29	25	50	104	25	504	40	569	1	12	5	18	69	424	1	494	1185
Total	159	88	216	463	66	1933	126	2125	2	44	28	74	255	1703	2	1960	4622
08:00 AM	47	20	58	125	18	421	42	481	0	10	2	12	68	417	0	485	1103
08:15 AM	34	24	56	114	11	473	29	513	2	10	6	18	65	476	1	542	1187
Grand Total	417	237	483	1137	147	4203	253	4603	9	108	58	175	588	4151	5	4744	10659
Apprch %	36.7	20.8	42.5		3.2	91.3	5.5		5.1	61.7	33.1		12.4	87.5	0.1		
Total %	3.9	2.2	4.5	10.7	1.4	39.4	2.4	43.2	0.1	1.0	0.5	1.6	5.5	38.9	0.0	44.5	

	Ward Ave Southbound				Ala Moana Blvd Westbound				Ward Ave Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 05:30 AM to 08:15 AM - Peak 1 of 1																	
Intersection	07:30 AM																
Volume	151	93	224	468	68	1853	143	2064	3	44	27	74	285	1791	2	2078	4684
Percent	32.3	19.9	47.9		3.3	89.8	6.9		4.1	59.5	36.5		13.7	86.2	0.1		
07:30 Volume	41	24	60	125	14	455	32	501	0	12	14	26	83	474	0	557	1209
Peak Factor																	0.969
High Int.	07:30 AM				07:45 AM				07:30 AM				07:30 AM				
Volume	41	24	60	125	25	504	40	569	0	12	14	26	83	474	0	557	
Peak Factor				0.936				0.907				0.712				0.933	

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Counter: T-1841/T-1839
Counted By: GMT/IQ
Weather: Clear

File Name : alawarp
Site Code : 00000005
Start Date : 11/10/2004
Page No : 1

Groups Printed- Unshifted

	Ward Ave Southbound				Ala Moana Blvd Westbound				Ward Ave Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Factor	1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		1.0	1.0	1.0		
03:30 PM	60	16	102	178	9	412	61	482	1	14	14	29	83	467	1	551	1240
03:45 PM	60	13	73	146	5	453	44	502	0	18	6	24	70	520	2	592	1264
Total	120	29	175	324	14	865	105	984	1	32	20	53	153	987	3	1143	2504
04:00 PM	68	13	70	151	7	373	47	427	0	20	8	28	60	513	3	576	1182
04:15 PM	72	8	90	170	9	438	61	508	1	21	6	28	80	554	0	634	1340
04:30 PM	45	11	80	136	10	370	50	430	4	36	14	54	70	514	1	585	1205
04:45 PM	76	13	69	158	36	296	72	404	1	19	18	38	73	485	3	561	1161
Total	261	45	309	615	62	1477	230	1769	6	96	46	148	283	2066	7	2356	4888
05:00 PM	59	10	59	128	9	399	70	478	2	26	14	42	59	587	3	649	1297
05:15 PM	67	14	81	162	13	332	81	426	2	27	16	45	65	522	1	588	1221
05:30 PM	47	16	90	153	13	347	49	409	3	22	9	34	73	604	0	677	1273
05:45 PM	64	10	80	154	7	374	68	449	1	22	18	41	78	556	0	634	1278
Total	237	50	310	597	42	1452	268	1762	8	97	57	162	275	2269	4	2548	5069
06:00 PM	43	11	76	130	7	353	48	408	1	20	7	28	58	511	1	570	1136
06:15 PM	57	9	69	135	6	371	51	428	2	19	8	29	53	521	0	574	1166
Grand Total	718	144	939	1801	131	4518	702	5351	18	264	138	420	822	6354	15	7191	14763
Apprch %	39.9	8.0	52.1		2.4	84.4	13.1		4.3	62.9	32.9		11.4	88.4	0.2		
Total %	4.9	1.0	6.4	12.2	0.9	30.6	4.8	36.2	0.1	1.8	0.9	2.8	5.6	43.0	0.1	48.7	

	Ward Ave Southbound				Ala Moana Blvd Westbound				Ward Ave Northbound				Ala Moana Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 03:30 PM to 06:15 PM - Peak 1 of 1																	
Intersection	05:00 PM																
Volume	237	50	310	597	42	1452	268	1762	8	97	57	162	275	2269	4	2548	5069
Percent	39.7	8.4	51.9		2.4	82.4	15.2		4.9	59.9	35.2		10.8	89.1	0.2		
05:00 Volume	59	10	59	128	9	399	70	478	2	26	14	42	59	587	3	649	1297
Peak Factor																	0.977
High Int.	05:15 PM				05:00 PM				05:15 PM				05:30 PM				
Volume	67	14	81	162	9	399	70	478	2	27	16	45	73	604	0	677	
Peak Factor				0.921				0.922				0.900				0.941	

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS) for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically a 15-min analysis period. The criteria are given in the following table.

Table 1: Level-of-Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec/veh)
A	≤10.0
B	>10.0 and ≤20.0
C	>20.0 and ≤35.0
D	>35.0 and ≤55.0
E	>55.0 and ≤80.0
F	>80.0

Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group.

Level of Service A describes operations with low control delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.

Level of Service B describes operations with control delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

Level of Service C describes operations with control delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

Level of Service D describes operations with control delay greater than 35 and up to 55 sec per vehicle. At level of service D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

"Highway Capacity Manual," Transportation Research Board, 2000.

Level of Service E describes operation with control delay greater than 55 and up to 80 sec per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

Level of Service F describes operations with control delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

"Highway Capacity Manual," Transportation Research Board, 2000.

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Level of Service (LOS) criteria are given in Table 1. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. If the degree of saturation is greater than about 0.9, average control delay is significantly affected by the length of the analysis period.

Table 1: Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (Sec/Veh)
A	≤10.0
B	>10.0 and ≤15.0
C	>15.0 and ≤25.0
D	>25.0 and ≤35.0
E	>35.0 and ≤50.0
F	>50.0

"Highway Capacity Manual," Transportation Research Board, 2000.

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS
EXISTING PEAK HOUR TRAFFIC ANALYSIS

HCS2000: Signalized Intersections Release 4.1e

Analyst:	Inter.:
Agency:	Area Type: All other areas
Date: 02/01/05	Jurisd:
Period: AM Peak	Year : Existing
Project ID:	
E/W St: Ala Moana Boulevard	N/S St: Punchbowl Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	3	0	0	3	0	0	0	0	2	0	2
LGConfig		T			T					L		R
Volume		2660			2086					175		310
Lane Width		12.0			12.0					12.0		12.0
RTOR Vol												31

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left				
Thru	A					Thru				
Right						Right				
Peds						Peds				
WB Left					SB	Left	A			
Thru	A					Thru				
Right						Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	84.5						45.5			
Yellow	4.0						4.0			
All Red	1.0						1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	3097	5131	0.95	0.60	36.0	D	36.0	D
Westbound								
T	3097	5131	0.68	0.60	19.3	B	19.3	B
Northbound								
Southbound								
L	1085	3338	0.18	0.32	33.9	C	35.3	D
R	885	2722	0.35	0.32	36.2	D		

Intersection Delay = 29.6 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL	Inter.:
Agency:	Area Type: All other areas
Date: 2/1/05	Jurisd:
Period: PM Peak	Year : Existing
Project ID:	
E/W St: Ala Moana Boulevard	N/S St: Punchbowl Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	3	0	0	3	0	0	0	0	2	0	2
LGConfig		T			T					L		R
Volume		2465			2335					152		603
Lane Width		12.0			12.0					12.0		12.0
RTOR Vol												60

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left				
Thru	A					Thru				
Right						Right				
Peds						Peds				
WB Left					SB	Left	A			
Thru	A					Thru				
Right						Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	78.0						52.0			
Yellow	4.0						4.0			
All Red	1.0						1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	2859	5131	0.94	0.56	36.6	D	36.6	D
Westbound								
T	2859	5131	0.86	0.56	29.3	C	29.3	C
Northbound								
Southbound								
L	1240	3338	0.14	0.37	29.2	C	35.2	D
R	1011	2722	0.61	0.37	36.9	D		

Intersection Delay = 33.4 (sec/veh) Intersection LOS = C

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                HCS2000: Signalized Intersections Release 4.1e

Analyst:                                  Inter.:
Agency:                                   Area Type: All other areas
Date:    2/1/05                           Jurisd:
Period: AM Peak                           Year  : Existing
Project ID:
E/W St: Ala Moana Boulevard               N/S St: South Street/Forrest Ave

_________________________SIGNALIZED INTERSECTION SUMMARY______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
           |               |               |               |               |
No. Lanes  |  1    3    0  |  0    3    0  |  0    1    0  |  0    1    1  |
LGConfig   | L    TR       |      TR       |      LTR      |      LT   R   |
Volume     |268  2496 66   |     1867 136  |43   26   0    |10   18   37   |
Lane Width |12.0 12.0      |     12.0      |     12.0      |     12.0 12.0 |
RTOR Vol   |          7    |          14   |          0    |          0    |
______________________________________________________________________________
Duration     1.00       Area Type: All other areas
_______________________________Signal Operations_______________________________
Phase Combination 1     2     3     4 |         5     6     7     8
EB  Left          A                   | NB  Left    A
    Thru          A     A             |     Thru    A
    Right         A     A             |     Right   A
    Peds                              |     Peds
WB  Left                              | SB  Left    A
    Thru                A             |     Thru    A
    Right               A             |     Right   A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            43.5  71.5                    35.0
Yellow           0.0   4.0                     4.0
All Red          0.0   1.0                     1.0
                                                Cycle Length: 160.0    secs
___________________Intersection Performance Summary___________________________
Appr/  Lane      Adj Sat    Ratios       Lane Group    Approach
Lane   Group     Flow Rate  ________     ____________  ____________
Grp    Capacity    (s)      v/c    g/C   Delay LOS     Delay LOS
______________________________________________________________________________
Eastbound
L       493       1814      0.57   0.27   51.7   D
TR      3675      5113      0.72   0.72   13.9   B     17.5    B

Westbound

TR      2272      5084      0.94   0.45   52.8   D     52.8    D

Northbound

LTR     317       1447      0.28   0.22   52.5   D     52.5    D

Southbound

LT      360       1644      0.09   0.22   49.9   D     50.2    D
R       336       1538      0.13   0.22   50.4   D
        Intersection Delay = 33.0  (sec/veh)   Intersection LOS = C
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                HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                               Inter.:
Agency:                                   Area Type: All other areas
Date:    2/1/05                           Jurisd:
Period: PM Peak                           Year  : Existing
Project ID:
E/W St: Ala Moana Boulevard               N/S St: South Street/Forrest Ave

_________________________SIGNALIZED INTERSECTION SUMMARY______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
           |               |               |               |               |
No. Lanes  |  1    3    0  |  0    3    0  |  0    1    0  |  0    1    1  |
LGConfig   | L    TR       |      TR       |      LTR      |      LT   R   |
Volume     |224  2792 6    |     1904 88   |90   54   0    |45   0    254  |
Lane Width |12.0 12.0      |     12.0      |     12.0      |     12.0 12.0 |
RTOR Vol   |          1    |          9    |          0    |          0    |
______________________________________________________________________________
Duration     1.00       Area Type: All other areas
_______________________________Signal Operations_______________________________
Phase Combination 1     2     3     4 |         5     6     7     8
EB  Left          A                   | NB  Left    A
    Thru          A     A             |     Thru    A
    Right         A     A             |     Right   A
    Peds                              |     Peds
WB  Left                              | SB  Left    A
    Thru                A             |     Thru    A
    Right               A             |     Right   A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            37.5  67.5                    45.0
Yellow           0.0   4.0                     4.0
All Red          0.0   1.0                     1.0
                                                Cycle Length: 160.0    secs
___________________Intersection Performance Summary___________________________
Appr/  Lane      Adj Sat    Ratios       Lane Group    Approach
Lane   Group     Flow Rate  ________     ____________  ____________
Grp    Capacity    (s)      v/c    g/C   Delay LOS     Delay LOS
______________________________________________________________________________
Eastbound
L       425       1814      0.61   0.23   57.4   E
TR      3367      5130      0.97   0.66   37.9   D     39.3    D

Westbound

TR      2152      5101      0.95   0.42   57.4   E     57.4    E

Northbound

LTR     378       1344      0.47   0.28   48.5   D     48.5    D

Southbound

LT      332       1181      0.17   0.28   43.6   D     55.9    E
R       433       1538      0.73   0.28   58.1   E
        Intersection Delay = 46.7  (sec/veh)   Intersection LOS = D
______________________________________________________________________________
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                HCS2000: Signalized Intersections Release 4.1e

Analyst:                                  Inter.:
Agency:                                   Area Type: All other areas
Date:   2/1/05                            Jurisd:
Period: AM Peak                           Year  : Existing
Project ID:
E/W St: Ala Moana Boulevard               N/S St: Keawe Street

__________________________SIGNALIZED INTERSECTION SUMMARY__________________
            |  Eastbound   |  Westbound   |  Northbound  |  Southbound  |
            | L   T   R    | L   T   R    | L   T   R    | L   T   R    |
            |______________|______________|______________|______________|
No. Lanes   |  1   3   0   |  1   3   0   |  0   1   0   |  0   1   0   |
LGConfig    | L    TR      | L    TR      |     LTR      |     LTR      |
Volume      |142  2208 34  |3    2039 46  |12   7    6   |15   6    53  |
Lane Width  |12.0 12.0     |12.0 12.0     |     12.0     |     12.0     |
RTOR Vol    |          3   |          5   |          1   |          5   |
___________________________________________________________________________
Duration     1.00       Area Type: All other areas
________________________________Signal Operations__________________________
Phase Combination 1     2     3     4  |            5     6     7     8
EB  Left          A                    | NB  Left   A
    Thru                A              |     Thru   A
    Right               A              |     Right  A
    Peds                               |     Peds
WB  Left          A                    | SB  Left         A
    Thru                A              |     Thru         A
    Right               A              |     Right        A
    Peds                               |     Peds
NB  Right                              | EB  Right
SB  Right                              | WB  Right
Green            21.0  65.0                        14.5  19.5
Yellow           4.0   4.0                         4.0   4.0
All Red          1.0   1.0                         1.0   1.0
                                                    Cycle Length: 140.0   secs
________________________Intersection Performance Summary___________________
Appr/   Lane        Adj Sat    Ratios          Lane Group    Approach
Lane    Group       Flow Rate  __________      __________    __________
Grp     Capacity    (s)        v/c    g/C      Delay LOS     Delay LOS
___________________________________________________________________________
Eastbound
L        272        1814       0.54   0.15     57.3   E
TR       2377       5120       0.98   0.46     59.7   E      59.6   E

Westbound
L        272        1814       0.01   0.15     50.7   D
TR       2375       5116       0.92   0.46     42.6   D      42.6   D

Northbound

LTR      178        1715       0.21   0.10     58.1   E      58.1   E

Southbound

LTR      226        1621       0.53   0.14     58.3   E      58.3   E

         Intersection Delay = 51.8  (sec/veh)   Intersection LOS = D
___________________________________________________________________________
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                HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                               Inter.:
Agency:                                   Area Type: All other areas
Date:   2/1/05                            Jurisd:
Period: PM Peak                           Year  : Existing
Project ID:
E/W St: Ala Moana Boulevard               N/S St: Keawe Street

__________________________SIGNALIZED INTERSECTION SUMMARY__________________
            |  Eastbound   |  Westbound   |  Northbound  |  Southbound  |
            | L   T   R    | L   T   R    | L   T   R    | L   T   R    |
            |______________|______________|______________|______________|
No. Lanes   |  1   3   0   |  1   3   0   |  0   1   0   |  0   1   0   |
LGConfig    | L    TR      | L    TR      |     LTR      |     LTR      |
Volume      |45   2456 19  |0    1855 76  |57   13   6   |39   1    150 |
Lane Width  |12.0 12.0     |12.0 12.0     |     12.0     |     12.0     |
RTOR Vol    |          2   |          8   |          1   |          15  |
___________________________________________________________________________
Duration     1.00       Area Type: All other areas
________________________________Signal Operations__________________________
Phase Combination 1     2     3     4  |            5     6     7     8
EB  Left          A                    | NB  Left   A
    Thru                A              |     Thru   A
    Right               A              |     Right  A
    Peds                               |     Peds
WB  Left          A                    | SB  Left         A
    Thru                A              |     Thru         A
    Right               A              |     Right        A
    Peds                               |     Peds
NB  Right                              | EB  Right
SB  Right                              | WB  Right
Green            9.5   71.0                        13.5  26.0
Yellow           4.0   4.0                         4.0   4.0
All Red          1.0   1.0                         1.0   1.0
                                                    Cycle Length: 140.0   secs
________________________Intersection Performance Summary___________________
Appr/   Lane        Adj Sat    Ratios          Lane Group    Approach
Lane    Group       Flow Rate  __________      __________    __________
Grp     Capacity    (s)        v/c    g/C      Delay LOS     Delay LOS
___________________________________________________________________________
Eastbound
L        123        1814       0.38   0.07     64.4   E
TR       2600       5126       0.99   0.51     61.7   E      61.8   E

Westbound
L        126        1863       0.00   0.07     60.8   E
TR       2588       5104       0.87   0.51     34.4   C      34.4   C

Northbound

LTR      167        1727       0.59   0.10     66.3   E      66.3   E

Southbound

LTR      298        1603       0.76   0.19     65.9   E      65.9   E

         Intersection Delay = 50.1  (sec/veh)   Intersection LOS = D
___________________________________________________________________________
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            HCS2000: Signalized Intersections Release 4.1e

Analyst:                                  Inter.:
Agency:                                   Area Type: All other areas
Date:    2/1/05                           Jurisd:
Period: AM Peak                           Year  : Existing
Project ID:
E/W St: Ala Moana Boulevard               N/S St: Coral Street

________________________SIGNALIZED INTERSECTION SUMMARY_______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
           |               |               |               |               |
No. Lanes  |   1    3    0 |   1    3    0 |   0    1    0 |   0    1    0 |
LGConfig   | L     TR      | L     TR      |      LTR      |      LTR      |
Volume     |65    2082 93  |46    2083 30  |8     8     5  |18    32    22 |
Lane Width |12.0 12.0      |12.0 12.0      |     12.0      |     12.0      |
RTOR Vol   |          9    |          3    |           1   |           2   |
______________________________________________________________________________
Duration    1.00       Area Type: All other areas
_______________________________Signal Operations______________________________
Phase Combination 1     2     3     4 |           5     6     7     8
EB  Left          A                   | NB  Left  A
    Thru                A             |     Thru  A
    Right               A             |     Right A
    Peds                              |     Peds
WB  Left          A                   | SB  Left  A
    Thru                A             |     Thru  A
    Right               A             |     Right A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            29.0  65.5                      30.5
Yellow           4.0   4.0                       4.0
All Red          1.0   1.0                       1.0
                                                  Cycle Length: 140.0   secs
____________________Intersection Performance Summary__________________________
Appr/   Lane        Adj Sat     Ratios         Lane Group    Approach
Lane    Group       Flow Rate  __________     __________   ___________
Grp     Capacity     (s)       v/c    g/C     Delay LOS    Delay LOS
______________________________________________________________________________
Eastbound
L        376        1814       0.18   0.21    45.9   D
TR       2387       5101       0.95   0.47    46.3   D     46.3    D

Westbound
L        376        1814       0.13   0.21    45.4   D
TR       2396       5121       0.93   0.47    43.0   D     43.0    D

Northbound

LTR      346        1588       0.09   0.22    43.8   D     43.8    D

Southbound

LTR      352        1618       0.26   0.22    45.7   D     45.7    D

         Intersection Delay = 44.7  (sec/veh)    Intersection LOS = D
______________________________________________________________________________
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            HCS2000: Signalized Intersections Release 4.1e

Analyst:                                  Inter.:
Agency:                                   Area Type: All other areas
Date:    2/1/05                           Jurisd:
Period: PM Peak                           Year  : Existing
Project ID:
E/W St: Ala Moana Boulevard               N/S St: Coral Street

________________________SIGNALIZED INTERSECTION SUMMARY_______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
           |               |               |               |               |
No. Lanes  |   1    3    0 |   1    3    0 |   0    1    0 |   0    1    0 |
LGConfig   | L     TR      | L     TR      |      LTR      |      LTR      |
Volume     |28    2506 29  |10    1894 21  |52    42    41 |15    22    49 |
Lane Width |12.0 12.0      |12.0 12.0      |     12.0      |     12.0      |
RTOR Vol   |          3    |          2    |           4   |           5   |
______________________________________________________________________________
Duration    1.00       Area Type: All other areas
_______________________________Signal Operations______________________________
Phase Combination 1     2     3     4 |           5     6     7     8
EB  Left          A                   | NB  Left  A
    Thru                A             |     Thru  A
    Right               A             |     Right A
    Peds                              |     Peds
WB  Left          A                   | SB  Left  A
    Thru                A             |     Thru  A
    Right               A             |     Right A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            20.5  75.5                      29.0
Yellow           4.0   4.0                       4.0
All Red          1.0   1.0                       1.0
                                                  Cycle Length: 140.0   secs
____________________Intersection Performance Summary__________________________
Appr/   Lane        Adj Sat     Ratios         Lane Group    Approach
Lane    Group       Flow Rate  __________     __________   ___________
Grp     Capacity     (s)       v/c    g/C     Delay LOS    Delay LOS
______________________________________________________________________________
Eastbound
L        266        1814       0.11   0.15    52.0   D
TR       2763       5123       0.99   0.54    54.7   D     54.7    D

Westbound
L        266        1814       0.05   0.15    51.4   D
TR       2763       5123       0.82   0.54    29.0   C     29.1    C

Northbound

LTR      300        1446       0.57   0.21    52.5   D     52.5    D

Southbound

LTR      324        1566       0.27   0.21    47.0   D     47.0    D

         Intersection Delay = 43.4  (sec/veh)    Intersection LOS = D
______________________________________________________________________________
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HCS2000: Signalized Intersections Release 4.1e

Analyst:
Agency:
Date: 3/14/2005
Period: AM Peak
Project ID:
E/W St: Ala Moana Blvd

Inter.:
Area Type: All other areas
Jurisd:
Year : Existing
N/S St: Cooke St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	1	0	1	1
LGConfig	L	TR		L	TR			LT	R		LT	R
Volume	82	1985	38	32	2095	69	14	28	14	51	28	37
Lane Width	12.0	12.0		12.0	12.0			12.0	12.0		12.0	12.0
RTOR Vol			4			7			1			4

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru	A			
Right		A				Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru	A			
Right		A				Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	28.5	65.5					31.0			
Yellow	4.0	4.0					4.0			
All Red	1.0	1.0					1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	369	1814	0.23	0.20	46.9	D		
TR	2394	5118	0.89	0.47	38.7	D	39.0	D
Westbound								
L	369	1814	0.09	0.20	45.4	D		
TR	2390	5109	0.95	0.47	47.3	D	47.3	D
Northbound								
LT	359	1623	0.16	0.22	44.2	D	43.9	D
R	341	1538	0.05	0.22	43.0	D		
Southbound								
LT	310	1398	0.34	0.22	46.5	D	45.7	D
R	341	1538	0.13	0.22	43.9	D		

Intersection Delay = 43.3 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 3/14/2005
Period: PM Peak
Project ID:
E/W St: Ala Moana Blvd

Inter.:
Area Type: All other areas
Jurisd:
Year : Existing
N/S St: Cooke St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	1	0	1	1
LGConfig	L	TR		L	TR			LT	R		LT	R
Volume	81	1970	38	16	1779	77	32	53	16	44	28	113
Lane Width	12.0	12.0		12.0	12.0			12.0	12.0		12.0	12.0
RTOR Vol			4			8			2			11

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru	A			
Right		A				Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru	A			
Right		A				Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	29.0	63.5					32.5			
Yellow	4.0	4.0					4.0			
All Red	1.0	1.0					1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	376	1814	0.23	0.21	46.5	D		
TR	2321	5118	0.91	0.45	42.0	D	42.1	D
Westbound								
L	376	1814	0.05	0.21	44.5	D		
TR	2314	5102	0.94	0.45	46.4	D	46.4	D
Northbound								
LT	360	1549	0.32	0.23	45.1	D	44.6	D
R	357	1538	0.05	0.23	41.9	D		
Southbound								
LT	312	1344	0.31	0.23	45.0	D	45.6	D
R	357	1538	0.38	0.23	46.0	D		

Intersection Delay = 44.4 (sec/veh) Intersection LOS = D

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.:
Date Performed: 2/1/05
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Existing
Project ID:
East/West Street: Ala Moana Boulevard
North/South Street: Ohe Street
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1399	22		1423	0
Peak-Hour Factor, PHF		0.94	0.94		0.95	0.95
Hourly Flow Rate, HFR		1488	23		1497	0
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			2			4
Peak Hour Factor, PHF			0.50			0.33
Hourly Flow Rate, HFR			4			12
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					4			12
C(m) (vph)					344			348
v/c					0.01			0.03
95% queue length					0.04			0.11
Control Delay					15.6			15.7
LOS					C			C
Approach Delay				15.6			15.7	
Approach LOS				C			C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 2/1/05
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Existing
Project ID:
East/West Street: Ala Moana Boulevard
North/South Street: Ohe Street
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1560	25		1353	0
Peak-Hour Factor, PHF		0.97	0.97		0.94	0.94
Hourly Flow Rate, HFR		1608	25		1439	0
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			30			2
Peak Hour Factor, PHF			0.83			0.25
Hourly Flow Rate, HFR			36			8
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					36			8
C(m) (vph)					314			364
v/c					0.11			0.02
95% queue length					0.39			0.07
Control Delay					17.9			15.1
LOS					C			C
Approach Delay				17.9			15.1	
Approach LOS				C			C	

HCS2000: Signalized Intersections Release 4.1e

Analyst:
Agency:
Date: 2/1/05
Period: AM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Existing
N/S St: Koula Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	T	R	Westbound L	T	R	Northbound L	T	R	Southbound L	T	R
No. Lanes	1	3	0	1	3	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	22	1926	14	24	2101	14	10	3	6	9	9	14
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			1			1			1			1

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	35.0	73.0				37.0			
Yellow	4.0	4.0				4.0			
All Red	1.0	1.0				1.0			

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	g/C	Lane Group Delay	LOS	Approach Delay	LOS
Eastbound								
L	397	1814	0.06	0.22	49.5	D		
TR	2339	5126	0.89	0.46	45.0	D	45.0	D
Westbound								
L	397	1814	0.06	0.22	49.6	D		
TR	2339	5126	0.93	0.46	49.9	D	49.9	D
Northbound								
LTR	355	1536	0.06	0.23	48.1	D	48.1	D
Southbound								
LTR	369	1595	0.14	0.23	49.0	D	49.0	D

Intersection Delay = 47.5 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: PM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Existing
N/S St: Koula Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	T	R	Westbound L	T	R	Northbound L	T	R	Southbound L	T	R
No. Lanes	1	3	0	1	3	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	35	2302	22	7	2013	51	8	11	7	30	6	19
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			2			5			1			2

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	31.5	80.5				33.0			
Yellow	4.0	4.0				4.0			
All Red	1.0	1.0				1.0			

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	g/C	Lane Group Delay	LOS	Approach Delay	LOS
Eastbound								
L	357	1814	0.11	0.20	52.8	D		
TR	2578	5124	0.97	0.50	54.5	D	54.5	D
Westbound								
L	357	1814	0.02	0.20	51.9	D		
TR	2573	5114	0.86	0.50	38.2	D	38.2	D
Northbound								
LTR	334	1620	0.10	0.21	51.6	D	51.6	D
Southbound								
LTR	299	1452	0.21	0.21	53.0	D	53.0	D

Intersection Delay = 47.0 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: Inter.:
Agency: Area Type: All other areas
Date: 2/1/05 Jurisd:
Period: AM Peak Year : Existing
Project ID:
E/W St: Ala Moana Boulevard N/S St: Ward Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	1	0	2	1	1	2	0
LGConfig	L	TR		L	T	R		LT	R	L	LTR	
Volume	285	1791	2	68	1853	143	3	44	27	151	93	224
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0	12.0	12.0	12.0	
RTOR Vol			0			14			7			22

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A	A			NB Left		A		
Thru		A	A		Thru		A		
Right		A	A		Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru			A		Thru	A			
Right			A		Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	15.0	21.0	65.5			27.0	16.5		
Yellow	0.0	0.0	4.0			4.0	4.0		
All Red	0.0	0.0	1.0			1.0	1.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	408	1814	0.75	0.22	65.7	E		
TR	2773	5130	0.70	0.54	27.8	C	33.0	C
Westbound								
L	170	1814	0.44	0.09	70.4	E		
T	2101	5131	0.97	0.41	65.3	E	63.3	E
R	664	1623	0.21	0.41	30.7	C		
Northbound								
LT	354	3435	0.19	0.10	65.9	E	65.9	E
R	159	1538	0.18	0.10	66.1	E		
Southbound								
L	290	1719	0.42	0.17	60.4	E		
LTR	525	3114	0.67	0.17	65.8	E	64.5	E

Intersection Delay = 50.1 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL Inter.:
Agency: Area Type: All other areas
Date: 2/1/05 Jurisd:
Period: PM Peak Year : Existing
Project ID:
E/W St: Ala Moana Boulevard N/S St: Ward Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	1	0	2	1	1	2	0
LGConfig	L	TR		L	T	R		LT	R	L	LTR	
Volume	275	2269	4	42	1452	268	8	97	57	237	50	310
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0	12.0	12.0	12.0	
RTOR Vol			0			27			14			31

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A	A			NB Left		A		
Thru		A	A		Thru		A		
Right		A	A		Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru			A		Thru	A			
Right			A		Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	19.0	16.0	60.5			31.0	18.5		
Yellow	0.0	0.0	4.0			4.0	4.0		
All Red	0.0	0.0	1.0			1.0	1.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	397	1814	0.74	0.22	65.7	E		
TR	2453	5130	0.99	0.48	66.3	E	66.2	E
Westbound								
L	215	1814	0.21	0.12	64.2	E		
T	1940	5131	0.81	0.38	47.5	D	46.5	D
R	614	1623	0.43	0.38	37.4	D		
Northbound								
LT	397	3432	0.29	0.12	65.2	E	65.3	E
R	178	1538	0.27	0.12	65.4	E		
Southbound								
L	333	1719	0.58	0.19	61.2	E		
LTR	591	3050	0.71	0.19	64.5	E	63.4	E

Intersection Delay = 59.0 (sec/veh) Intersection LOS = E

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS
YEAR 2009 PEAK HOUR TRAFFIC ANALYSIS
WITH PROJECT

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                HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                                 Inter.:
Agency:                                     Area Type: All other areas
Date:    02/01/05                           Jurisd:
Period: AM Peak                             Year   : Year 2009 w/ project
Project ID: w/out intersection modifications
E/W St: Ala Moana Boulevard                 N/S St: Punchbowl Street

___________________________SIGNALIZED INTERSECTION SUMMARY______________________
           |  Eastbound   |  Westbound   |  Northbound  |  Southbound  |
           | L    T    R  | L    T    R  | L    T    R  | L    T    R  |
           |______________|______________|______________|______________|
No. Lanes  |  0    3    0 |  0    3    0 |  3    0    0 |  2    0    2 |
LGConfig   |      TR      |      T       | L            | L         R  |
Volume     |     2991 893 |     2123     |142           |209       318 |
Lane Width |     12.0     |     12.0     |12.0          |12.0      12.0 |
RTOR Vol   |          89  |              |              |           32 |
________________________________________________________________________________
Duration    1.00       Area Type: All other areas
________________________________Signal Operations_______________________________
Phase Combination 1      2      3      4 |           5      6      7      8
EB  Left                                 | NB  Left         A
    Thru          A                      |     Thru
    Right         A                      |     Right
    Peds                                 |     Peds
WB  Left                                 | SB  Left    A
    Thru          A                      |     Thru
    Right                                |     Right   A
    Peds                                 |     Peds
NB  Right                                | EB  Right
SB  Right                                | WB  Right
Green           105.0                              15.0   5.0
Yellow          4.0                                4.0    4.0
All Red         1.0                                1.0    1.0
                                                    Cycle Length: 140.0   secs
__________________Intersection Performance Summary______________________________
Appr/   Lane       Adj Sat     Ratios        Lane Group    Approach
Lane    Group     Flow Rate   _________      __________    __________
Grp     Capacity     (s)      v/c    g/C     Delay LOS     Delay LOS
________________________________________________________________________________
Eastbound

TR       3726       4968      1.13   0.75    258.3  F      258.3  F

Westbound

T        3848       5131      0.56   0.75    7.7    A      7.7    A

Northbound
L        167        4683      0.95   0.04    157.3  F
                                                           157.3  F

Southbound
L        358        3338      0.64   0.11    63.9   E
                                                           176.4  F
R        292        2722      1.08   0.11    258.9  F
         Intersection Delay = 173.7 (sec/veh)   Intersection LOS = F
________________________________________________________________________________
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                HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                                 Inter.:
Agency:                                     Area Type: All other areas
Date:    2/1/05                             Jurisd:
Period: PM Peak                             Year   : Year 2009 w/ project
Project ID: w/out modifications
E/W St: Ala Moana Boulevard                 N/S St: Punchbowl Street

___________________________SIGNALIZED INTERSECTION SUMMARY______________________
           |  Eastbound   |  Westbound   |  Northbound  |  Southbound  |
           | L    T    R  | L    T    R  | L    T    R  | L    T    R  |
           |______________|______________|______________|______________|
No. Lanes  |  0    3    0 |  0    3    0 |  3    0    0 |  2    0    2 |
LGConfig   |      TR      |      T       | L            | L         R  |
Volume     |     2511 217 |     2590     |858           |166       618 |
Lane Width |     12.0     |     12.0     |12.0          |12.0      12.0 |
RTOR Vol   |          22  |              |              |           62 |
________________________________________________________________________________
Duration    1.00       Area Type: All other areas
________________________________Signal Operations_______________________________
Phase Combination 1      2      3      4 |           5      6      7      8
EB  Left                                 | NB  Left         A
    Thru          A                      |     Thru
    Right         A                      |     Right
    Peds                                 |     Peds
WB  Left                                 | SB  Left    A
    Thru          A                      |     Thru
    Right                                |     Right   A
    Peds                                 |     Peds
NB  Right                                | EB  Right
SB  Right                                | WB  Right
Green           71.0                               29.0   25.0
Yellow          4.0                                4.0    4.0
All Red         1.0                                1.0    1.0
                                                    Cycle Length: 140.0   secs
__________________Intersection Performance Summary______________________________
Appr/   Lane       Adj Sat     Ratios        Lane Group    Approach
Lane    Group     Flow Rate   _________      __________    __________
Grp     Capacity     (s)      v/c    g/C     Delay LOS     Delay LOS
________________________________________________________________________________
Eastbound

TR       2574       5076      1.14   0.51    296.6  F      296.6  F

Westbound

T        2602       5131      1.05   0.51    133.5  F      133.5  F

Northbound
L        836        4683      1.14   0.18    325.9  F
                                                           325.9  F

Southbound
L        691        3338      0.27   0.21    46.9   D
                                                           240.9  F
R        564        2722      1.12   0.21    299.0  F
         Intersection Delay = 234.5 (sec/veh)   Intersection LOS = F
________________________________________________________________________________
```

HCS2000: Signalized Intersections Release 4.1e

Analyst:
Agency:
Date: 02/01/05
Period: AM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2009 w/ project
N/S St: Punchbowl Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	3	1	0	3	0	3	0	0	2	0	1
LGConfig		T	R		T		L			L		R
Volume		2991	893		2123		142			209		159
Lane Width		12.0	12.0		12.0		12.0			12.0		12.0
RTOR Vol			893									16

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left	A			
Thru	A				Thru				
Right	A				Right				
Peds					Peds				
WB Left					SB Left	A			
Thru	A				Thru				
Right					Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	92.0					38.0			
Yellow	4.0					4.0			
All Red	1.0					1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	3372	5131	0.99	0.66	43.4	D	43.4	D
R	1067	1623	0.00	0.66	8.2	A		
Westbound								
T	3372	5131	0.64	0.66	14.5	B	14.5	B
Northbound								
L	1271	4683	0.12	0.27	38.5	D	38.5	D
Southbound								
L	906	3338	0.25	0.27	40.1	D	40.8	D
R	417	1538	0.38	0.27	42.0	D		

Intersection Delay = 32.8 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst:
Agency:
Date: 2/1/05
Period: PM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2009 w/ project
N/S St: Punchbowl Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	3	1	0	3	0	3	0	0	2	0	1
LGConfig		T	R		T		L			L		R
Volume		2511	217		2590		858			166		309
Lane Width		12.0	12.0		12.0		12.0			12.0		12.0
RTOR Vol			217									31

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left	A			
Thru	A				Thru				
Right	A				Right				
Peds					Peds				
WB Left					SB Left	A			
Thru	A				Thru				
Right					Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	79.0					51.0			
Yellow	4.0					4.0			
All Red	1.0					1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	2895	5131	0.94	0.56	37.0	D	37.0	D
R	916	1623	0.00	0.56	13.3	B		
Westbound								
T	2895	5131	0.94	0.56	36.8	D	36.8	D
Northbound								
L	1706	4683	0.56	0.36	35.9	D	35.9	D
Southbound								
L	1216	3338	0.16	0.36	30.0	C	34.4	C
R	560	1538	0.56	0.36	36.9	D		

Intersection Delay = 36.6 (sec/veh) Intersection LOS = D

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                HCS2000: Signalized Intersections Release 4.1e

Analyst:                                 Inter.:
Agency:                                  Area Type: All other areas
Date:   2/1/05                           Jurisd:
Period: AM Peak                          Year  : Year 2009 w/ project
Project ID:
E/W St: Ala Moana Boulevard              N/S St: South Street/Forrest Ave

_________________________SIGNALIZED INTERSECTION SUMMARY______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound    |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R    |
           |_______________|_______________|_______________|________________|
No. Lanes  |  1    3    0  |  0    3    0  |  0    1    0  |  0    1    1   |
LGConfig   | L     TR      |      TR       |     LTR       |      LT    R   |
Volume     |275  2852 68   |    1899 139   |44   36   0    |10   62   38    |
Lane Width |12.0 12.0      |    12.0       |    12.0       |     12.0 12.0  |
RTOR Vol   |          7    |         14    |          0    |           0    |
______________________________________________________________________________
Duration    1.00      Area Type: All other areas
_______________________________Signal Operations______________________________
Phase Combination 1      2      3      4 |              5      6      7      8
EB  Left          A                      | NB  Left     A
    Thru          A      A               |     Thru     A
    Right         A      A               |     Right    A
    Peds                                 |     Peds
WB  Left                                 | SB  Left     A
    Thru                 A               |     Thru     A
    Right                A               |     Right    A
    Peds                                 |     Peds
NB  Right                                | EB  Right
SB  Right                                | WB  Right
Green           42.5   72.5                          35.0
Yellow          0.0    4.0                           4.0
All Red         0.0    1.0                           1.0
                                                  Cycle Length: 160.0    secs
____________________Intersection Performance Summary__________________________
Appr/  Lane      Adj Sat     Ratios         Lane Group    Approach
Lane   Group     Flow Rate  ___________    ___________   ___________
Grp    Capacity    (s)      v/c     g/C    Delay  LOS    Delay  LOS
______________________________________________________________________________
Eastbound
L        482       1814     0.59    0.27   53.2    D
TR       3676      5115     0.83    0.72   17.2    B     20.3    C

Westbound

TR       2304      5084     0.94    0.45   52.8    D     52.8    D

Northbound

LTR      278       1273     0.37    0.22   53.9    D     53.9    D

Southbound

LT       380       1735     0.22    0.22   51.6    D     51.2    D
R        336       1538     0.13    0.22   50.4    D
         Intersection Delay = 33.9  (sec/veh)   Intersection LOS = C
______________________________________________________________________________
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                HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                              Inter.:
Agency:                                  Area Type: All other areas
Date:   2/1/05                           Jurisd:
Period: PM Peak                          Year  : Year 2009 w/ project
Project ID:
E/W St: Ala Moana Boulevard              N/S St: South Street/Forrest Ave

_________________________SIGNALIZED INTERSECTION SUMMARY______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound    |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R    |
           |_______________|_______________|_______________|________________|
No. Lanes  |  1    3    0  |  0    3    0  |  0    1    0  |  0    1    1   |
LGConfig   | L     TR      |      TR       |     LTR       |      LT    R   |
Volume     |230  2856 6    |    2139 90    |92   101  0    |46   10   260   |
Lane Width |12.0 12.0      |    12.0       |    12.0       |     12.0 12.0  |
RTOR Vol   |          1    |          9    |          0    |           0    |
______________________________________________________________________________
Duration    1.00      Area Type: All other areas
_______________________________Signal Operations______________________________
Phase Combination 1      2      3      4 |              5      6      7      8
EB  Left          A                      | NB  Left     A
    Thru          A      A               |     Thru     A
    Right         A      A               |     Right    A
    Peds                                 |     Peds
WB  Left                                 | SB  Left     A
    Thru                 A               |     Thru     A
    Right                A               |     Right    A
    Peds                                 |     Peds
NB  Right                                | EB  Right
SB  Right                                | WB  Right
Green           33.5   73.5                          43.0
Yellow          0.0    4.0                           4.0
All Red         0.0    1.0                           1.0
                                                  Cycle Length: 160.0    secs
____________________Intersection Performance Summary__________________________
Appr/  Lane      Adj Sat     Ratios         Lane Group    Approach
Lane   Group     Flow Rate  ___________    ___________   ___________
Grp    Capacity    (s)      v/c     g/C    Delay  LOS    Delay  LOS
______________________________________________________________________________
Eastbound
L        380       1814     0.70    0.21   64.6    E
TR       3431      5130     0.97    0.67   37.9    D     39.9    D

Westbound

TR       2344      5103     0.98    0.46   63.1    E     63.1    E

Northbound

LTR      365       1358     0.64    0.27   55.7    E     55.7    E

Southbound

LT       306       1139     0.23    0.27   45.9    D     60.6    E
R        413       1538     0.78    0.27   63.8    E
         Intersection Delay = 49.9  (sec/veh)   Intersection LOS = D
______________________________________________________________________________
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HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: AM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2009 w/ project
N/S St: Keawe Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	146	2527	65	73	2075	47	12	17	21	15	71	54
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			7			5			2			5

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru	A			
Right		A				Right	A			
Peds						Peds				
WB Left	A				SB	Left		A		
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	16.0	73.5					9.0	21.5		
Yellow	4.0	4.0					4.0	4.0		
All Red	1.0	1.0					1.0	1.0		

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	207	1814	0.73	0.11	73.6	E		
TR	2685	5114	1.00	0.52	70.5	E	70.6	E
Westbound								
L	207	1814	0.37	0.11	58.5	E		
TR	2686	5116	0.83	0.52	30.4	C	31.3	C
Northbound								
LTR	109	1691	0.62	0.06	75.0	E	75.0	E
Southbound								
LTR	263	1712	0.79	0.15	73.3	E	73.3	E

Intersection Delay = 54.1 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: PM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2009 w/ project
N/S St: Keawe Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	46	2501	29	10	2088	78	58	43	91	40	21	154
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			3			8			9			15

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru	A			
Right		A				Right	A			
Peds						Peds				
WB Left	A				SB	Left		A		
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	6.5	71.5					20.0	22.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	1.0	1.0					1.0	1.0		

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	84	1814	0.57	0.05	74.7	E		
TR	2616	5123	1.01	0.51	75.5	E	75.5	E
Westbound								
L	84	1814	0.13	0.05	64.8	E		
TR	2608	5106	0.87	0.51	33.9	C	34.0	C
Northbound								
LTR	239	1674	0.80	0.14	78.3	E	78.3	E
Southbound								
LTR	255	1623	0.82	0.16	79.4	E	79.4	E

Intersection Delay = 58.1 (sec/veh) Intersection LOS = E

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              HCS2000: Signalized Intersections Release 4.1e

Analyst:                                  Inter.:
Agency:                                   Area Type: All other areas
Date:    2/1/05                           Jurisd:
Period: AM Peak                           Year  : Year 2009 w/ project
Project ID:
E/W St: Ala Moana Boulevard               N/S St: Coral Street

___________________________SIGNALIZED INTERSECTION SUMMARY_________________
              |  Eastbound     |  Westbound     |  Northbound    |  Southbound    |
              | L    T    R    | L    T    R    | L    T    R    | L    T    R    |
              |________________|________________|________________|________________|
No. Lanes     |  1    3    0   |  1    3    0   |  0    1    0   |  0    1    0   |
LGConfig      | L     TR       | L     TR       |      LTR       |      LTR       |
Volume        |67   2261 247   |141  2177 31    |21    16   15   |18    58   23   |
Lane Width    |12.0 12.0       |12.0 12.0       |      12.0      |      12.0      |
RTOR Vol      |           25   |           3    |           2    |           2    |
____________________________________________________________________________________
Duration     1.00       Area Type: All other areas
________________________________Signal Operations___________________________
Phase Combination 1     2     3     4  |          5     6     7     8
EB  Left          A                    | NB  Left  A
    Thru                A              |     Thru  A
    Right               A              |     Right A
    Peds                               |     Peds
WB  Left          A                    | SB  Left  A
    Thru                A              |     Thru  A
    Right               A              |     Right A
    Peds                               |     Peds
NB  Right                              | EB  Right
SB  Right                              | WB  Right
Green             27.5  73.0                     24.5
Yellow            4.0   4.0                      4.0
All Red           1.0   1.0                      1.0
                                                  Cycle Length: 140.0   secs
________________________Intersection Performance Summary___________________
Appr/  Lane       Adj Sat      Ratios        Lane Group   Approach
Lane   Group      Flow Rate  ____________   ___________  ___________
Grp    Capacity     (s)      v/c    g/C     Delay LOS    Delay LOS
____________________________________________________________________________
Eastbound
L       356        1814      0.20   0.20    47.3   D
TR      2639       5062      0.98   0.52    53.3   D      53.2   D

Westbound
L       356        1814      0.42   0.20    50.0   D
TR      2670       5121      0.87   0.52    32.8   C      33.9   C

Northbound

LTR     252        1440      0.30   0.17    51.0   D      51.0   D

Southbound

LTR     288        1645      0.43   0.17    52.6   D      52.6   D

       Intersection Delay = 44.2  (sec/veh)    Intersection LOS = D
____________________________________________________________________________
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              HCS2000: Signalized Intersections Release 4.1e

Analyst:                                  Inter.:
Agency:                                   Area Type: All other areas
Date:    2/1/05                           Jurisd:
Period: PM Peak                           Year  : Year 2009 w/ project
Project ID:
E/W St: Ala Moana Boulevard               N/S St: Coral Street

___________________________SIGNALIZED INTERSECTION SUMMARY_________________
              |  Eastbound     |  Westbound     |  Northbound    |  Southbound    |
              | L    T    R    | L    T    R    | L    T    R    | L    T    R    |
              |________________|________________|________________|________________|
No. Lanes     |  1    3    0   |  1    3    0   |  0    1    0   |  0    1    0   |
LGConfig      | L     TR       | L     TR       |      LTR       |      LTR       |
Volume        |29   2611 57    |38   2028 22    |163  64   106   |15   28   50    |
Lane Width    |12.0 12.0       |12.0 12.0       |      12.0      |      12.0      |
RTOR Vol      |           6    |           2    |           11   |           5    |
____________________________________________________________________________________
Duration     1.00       Area Type: All other areas
________________________________Signal Operations___________________________
Phase Combination 1     2     3     4  |          5     6     7     8
EB  Left          A                    | NB  Left  A     A
    Thru                A              |     Thru  A     A
    Right               A              |     Right A     A
    Peds                               |     Peds
WB  Left          A                    | SB  Left        A
    Thru                A              |     Thru        A
    Right               A              |     Right       A
    Peds                               |     Peds
NB  Right                              | EB  Right
SB  Right                              | WB  Right
Green             6.5   77.5                     27.5  13.5
Yellow            4.0   4.0                      0.0   4.0
All Red           1.0   1.0                      0.0   1.0
                                                  Cycle Length: 140.0   secs
________________________Intersection Performance Summary___________________
Appr/  Lane       Adj Sat      Ratios        Lane Group   Approach
Lane   Group      Flow Rate  ____________   ___________  ___________
Grp    Capacity     (s)      v/c    g/C     Delay LOS    Delay LOS
____________________________________________________________________________
Eastbound
L       84         1814      0.37   0.05    67.5   E
TR      2832       5116      1.01   0.55    76.5   E      76.4   E

Westbound
L       84         1814      0.54   0.05    72.0   E
TR      2836       5123      0.86   0.55    29.6   C      30.4   C

Northbound

LTR     425        1694      0.89   0.29    73.0   E      73.0   E

Southbound

LTR     142        1472      0.66   0.10    72.6   E      72.6   E

       Intersection Delay = 56.6  (sec/veh)    Intersection LOS = E
____________________________________________________________________________
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HCS2000: Signalized Intersections Release 4.1e

Analyst:
Agency:
Date: 3/14/2005
Period: AM Peak
Project ID:
E/W St: Ala Moana Blvd

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2009 w/ project
N/S St: Cooke St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	1	0	1	1
LGConfig	L	TR		L	TR			LT	R		LT	R
Volume	84	2005	206	129	2273	71	24	31	23	52	84	38
Lane Width	12.0	12.0		12.0	12.0			12.0	12.0		12.0	12.0
RTOR Vol			21			7			2			4

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	25.0	69.5				30.5			
Yellow	4.0	4.0				4.0			
All Red	1.0	1.0				1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	324	1814	0.27	0.18	50.1	D		
TR	2515	5066	0.92	0.50	39.2	D	39.6	D
Westbound								
L	324	1814	0.42	0.18	51.9	D		
TR	2537	5110	0.97	0.50	50.8	D	50.9	D
Northbound								
LT	309	1417	0.24	0.22	45.5	D	45.0	D
R	335	1538	0.08	0.22	43.7	D		
Southbound								
LT	333	1527	0.54	0.22	50.4	D	49.2	D
R	335	1538	0.13	0.22	44.3	D		

Intersection Delay = 45.6 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst:
Agency:
Date: 3/14/2005
Period: PM Peak
Project ID:
E/W St: Ala Moana Blvd

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2009 w/ project
N/S St: Cooke St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	1	0	1	1
LGConfig	L	TR		L	TR			LT	R		LT	R
Volume	93	2107	47	25	1821	79	150	78	90	45	37	116
Lane Width	12.0	12.0		12.0	12.0			12.0	12.0		12.0	12.0
RTOR Vol			5			8			9			12

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A	A		
Thru		A			Thru	A	A		
Right		A			Right	A	A		
Peds					Peds				
WB Left	A				SB Left		A		
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	17.0	63.5				22.5	22.0		
Yellow	4.0	4.0				0.0	4.0		
All Red	1.0	1.0				0.0	1.0		

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	220	1814	0.45	0.12	58.6	E		
TR	2320	5116	0.98	0.45	57.6	E	57.6	E
Westbound								
L	220	1814	0.13	0.12	55.2	E		
TR	2314	5102	0.96	0.45	52.2	D	52.3	D
Northbound								
LT	419	1752	0.73	0.32	48.7	D	45.2	D
R	489	1538	0.22	0.32	35.3	D		
Southbound								
LT	191	1215	0.57	0.16	58.7	E	58.3	E
R	242	1538	0.57	0.16	58.0	E		

Intersection Delay = 54.4 (sec/veh) Intersection LOS = D

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.:
Date Performed: 2/1/05
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID:
East/West Street: Ala Moana Boulevard
North/South Street: Ohe Street
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1420	23		1606	0
Peak-Hour Factor, PHF		0.94	0.94		0.95	0.95
Hourly Flow Rate, HFR		1510	24		1690	0
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			2			4
Peak Hour Factor, PHF			0.50			0.33
Hourly Flow Rate, HFR			4			12
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					4			12
C(m) (vph)					338			300
v/c					0.01			0.04
95% queue length					0.04			0.12
Control Delay					15.8			17.5
LOS					C			C
Approach Delay				15.8			17.5	
Approach LOS				C			C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.:
Date Performed: 2/1/05
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID:
East/West Street: Ala Moana Boulevard
North/South Street: Ohe Street
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1707	26		1391	0
Peak-Hour Factor, PHF		0.97	0.97		0.94	0.94
Hourly Flow Rate, HFR		1759	26		1479	0
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			31			2
Peak Hour Factor, PHF			0.83			0.25
Hourly Flow Rate, HFR			37			8
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					37			8
C(m) (vph)					279			353
v/c					0.13			0.02
95% queue length					0.46			0.07
Control Delay					19.9			15.4
LOS					C			C
Approach Delay				19.9			15.4	
Approach LOS				C			C	

HCS2000: Signalized Intersections Release 4.1e

Analyst:
Agency:
Date: 2/1/05
Period: AM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2009 w/ project
N/S St: Koula Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	23	1953	14	9	2376	14	10	3	6	9	9	14
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			1			1			1			1

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru	A			
Right		A				Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru	A			
Right		A				Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	32.0	80.0					33.0			
Yellow	4.0	4.0					4.0			
All Red	1.0	1.0					1.0			

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	363	1814	0.07	0.20	52.0	D		
TR	2563	5126	0.82	0.50	36.4	D	36.6	D
Westbound								
L	363	1814	0.02	0.20	51.5	D		
TR	2564	5127	0.96	0.50	51.9	D	51.9	D
Northbound								
LTR	316	1530	0.07	0.21	51.3	D	51.3	D
Southbound								
LTR	328	1592	0.16	0.21	52.3	D	52.3	D

Intersection Delay = 44.9 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst:
Agency:
Date: 2/1/05
Period: PM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2009 w/ project
N/S St: Koula Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	36	2522	23	7	2070	52	8	11	7	31	6	19
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			2			5			1			2

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru	A			
Right		A				Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru	A			
Right		A				Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	28.0	87.0					30.0			
Yellow	4.0	4.0					4.0			
All Red	1.0	1.0					1.0			

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	317	1814	0.12	0.17	55.8	E		
TR	2787	5125	0.98	0.54	56.2	E	56.2	E
Westbound								
L	317	1814	0.03	0.17	54.7	D		
TR	2781	5114	0.82	0.54	32.1	C	32.2	C
Northbound								
LTR	303	1616	0.11	0.19	54.1	D	54.1	D
Southbound								
LTR	271	1443	0.23	0.19	55.7	E	55.7	E

Intersection Delay = 45.5 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst:
Agency:
Date: 2/1/05
Period: AM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2009 w/ project
N/S St: Ward Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	1	0	2	1	1	2	0
LGConfig	L	TR		L	T	R		LT	R	L	LTR	
Volume	292	1815	2	208	2111	147	3	50	50	155	94	240
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0	12.0	12.0	12.0	
RTOR Vol			0			15			13			24

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	33.5	72.5				24.0	10.0		
Yellow	4.0	4.0				4.0	4.0		
All Red	1.0	1.0				1.0	1.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	380	1814	0.83	0.21	76.1	E		
TR	2325	5130	0.84	0.45	41.7	D	46.4	D
Westbound								
L	380	1814	0.60	0.21	59.9	E		
T	2325	5131	1.00	0.45	79.0	E	74.6	E
R	735	1623	0.20	0.45	26.4	C		
Northbound								
LT	215	3435	0.31	0.06	72.5	E	74.0	E
R	96	1538	0.48	0.06	76.3	E		
Southbound								
L	258	1719	0.48	0.15	63.7	E		
LTR	466	3108	0.80	0.15	75.7	E	72.7	E

Intersection Delay = 62.9 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: PM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2009 w/ project
N/S St: Ward Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	1	0	2	1	1	2	0
LGConfig	L	TR		L	T	R		LT	R	L	LTR	
Volume	287	2473	14	114	1495	275	8	119	200	243	61	318
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0	12.0	12.0	12.0	
RTOR Vol			1			28			100			32

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A	A			NB Left		A		
Thru		A	A		Thru		A		
Right		A	A		Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru			A		Thru	A			
Right			A		Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	17.0	16.0	66.5			28.0	17.5		
Yellow	0.0	0.0	4.0			4.0	4.0		
All Red	0.0	0.0	1.0			1.0	1.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	374	1814	0.82	0.21	75.1	E		
TR	2644	5127	1.00	0.52	74.1	E	74.2	E
Westbound								
L	193	1814	0.64	0.11	75.9	E		
T	2133	5131	0.76	0.42	41.7	D	42.6	D
R	675	1623	0.40	0.42	33.1	C		
Northbound								
LT	376	3435	0.35	0.11	66.6	E	70.5	E
R	168	1538	0.63	0.11	75.4	E		
Southbound								
L	301	1719	0.66	0.17	66.8	E		
LTR	535	3060	0.83	0.17	75.1	E	72.6	E

Intersection Delay = 63.0 (sec/veh) Intersection LOS = E

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Forrest St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	589	304	89	138	5	42	4	12	15	43	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.95		0.95		0.95		0.95	
Flow Rate	940		243		60		60	
% Heavy Veh	5		5		5		5	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	940		243		60		60	
Left-Turn	0		93		44		15	
Right-Turn	320		5		12		0	
Prop. Left-Turns	0.0		0.4		0.7		0.3	
Prop. Right-Turns	0.3		0.0		0.2		0.0	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	-0.1		0.1		0.1		0.1	

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	940		243		60		60	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.84		0.22		0.05		0.05	
hd, final value	4.54		5.41		6.62		6.64	
x, final value	1.19		0.36		0.11		0.11	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	2.5		3.4		4.6		4.6	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	940		243		60		60	
Service Time	2.5		3.4		4.6		4.6	
Utilization, x	1.19		0.36		0.11		0.11	
Dep. headway, hd	4.54		5.41		6.62		6.64	
Capacity	940		493		310		310	
Delay	368.68		11.51		10.44		10.47	
LOS	F		B		B		B	
Approach:								
Delay	368.68		11.51		10.44		10.47	
LOS	F		B		B		B	

Intersection Delay 269.08 Intersection LOS F

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Forrest St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	163	54	16	625	20	263	26	77	5	5	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.95		0.95		0.95		0.95	
Flow Rate	227		694		384		10	
% Heavy Veh	5		5		5		5	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	227		694		384		10	
Left-Turn	0		16		276		5	
Right-Turn	56		21		81		0	
Prop. Left-Turns	0.0		0.0		0.7		0.5	
Prop. Right-Turns	0.2		0.0		0.2		0.0	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	-0.1		0.1		0.1		0.2	

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	227		694		384		10	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.20		0.62		0.34		0.01	
hd, final value	6.38		5.82		6.50		7.83	
x, final value	0.40		1.12		0.69		0.02	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	4.4		3.8		4.5		5.8	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	227		694		384		10	
Service Time	4.4		3.8		4.5		5.8	
Utilization, x	0.40		1.12		0.69		0.02	
Dep. headway, hd	6.38		5.82		6.50		7.83	
Capacity	477		694		549		260	
Delay	13.65		271.52		23.79		11.00	
LOS	B		F		C		B	
Approach:								
Delay	13.65		271.52		23.79		11.00	
LOS	B		F		C		B	

Intersection Delay 152.68 Intersection LOS F

HCS2000: Unsignalized Intersections Release 4.1d

Wilson Okamoto
Wilson Okamoto

Phone: Fax:
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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Forrest St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
Volume	0	589	304	89	138	5	42	4	12	15	43	0
% Thrus Left Lane		75			50							

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	464	475	165	77	44	16	15	45
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	464	475	165	77	44	16	15	45
Left-Turn	0	0	93	0	44	0	15	0
Right-Turn	0	320	0	5	0	12	0	0
Prop. Left-Turns	0.0	0.0	0.6	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.7	0.0	0.1	0.0	0.8	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.4	0.4	0.0	0.6	-0.4	0.6	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	464	475	165	77	44	16	15	45
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.41	0.42	0.15	0.07	0.04	0.01	0.01	0.04
hd, final value	5.29	4.82	6.28	5.95	7.56	6.54	7.57	7.07
x, final value	0.68	0.64	0.29	0.13	0.09	0.03	0.03	0.09
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.0	2.5	4.0	3.7	5.3	4.2	5.3	4.8

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	464	475	165	77	44	16	15	45
Service Time	3.0	2.5	4.0	3.7	5.3	4.2	5.3	4.8
Utilization, x	0.68	0.64	0.29	0.13	0.09	0.03	0.03	0.09
Dep. headway, hd	5.29	4.82	6.28	5.95	7.56	6.54	7.57	7.07
Capacity	677	725	415	327	294	266	265	295
Delay	19.09	15.81	11.51	9.52	11.03	9.43	10.51	10.45
LOS	C	C	B	A	B	A	B	B
Approach:								
Delay	17.43		10.88		10.61		10.47	
LOS	C		B		B		B	

Intersection Delay 15.58 Intersection LOS C

HCS2000: Unsignalized Intersections Release 4.1d

Wilson Okamoto
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E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Forrest St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	163	54	16	625	20	263	26	77	5	5	0
% Thrus Left Lane		75			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	128	99	344	350	276	108	5	5
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	128	99	344	350	276	108	5	5
Left-Turn	0	0	16	0	276	0	5	0
Right-Turn	0	56	0	21	0	81	0	0
Prop. Left-Turns	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.6	0.0	0.1	0.0	0.8	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.3	0.1	0.0	0.6	-0.4	0.6	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	128	99	344	350	276	108	5	5
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.11	0.09	0.31	0.31	0.25	0.10	0.00	0.00
hd, final value	6.82	6.43	6.25	6.19	7.35	6.32	8.08	7.58
x, final value	0.24	0.18	0.60	0.60	0.56	0.19	0.01	0.01
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	4.5	4.1	4.0	3.9	5.0	4.0	5.8	5.3

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	128	99	344	350	276	108	5	5
Service Time	4.5	4.1	4.0	3.9	5.0	4.0	5.8	5.3
Utilization, x	0.24	0.18	0.60	0.60	0.56	0.19	0.01	0.01
Dep. headway, hd	6.82	6.43	6.25	6.19	7.35	6.32	8.08	7.58
Capacity	378	349	568	574	478	358	255	255
Delay	11.70	10.50	18.13	18.12	19.42	10.50	10.87	10.36
LOS	B	B	C	C	C	B	B	B
Approach:								
Delay	11.18		18.12		16.91		10.62	
LOS	B		C		C		B	

Intersection Delay 16.51 Intersection LOS C

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Keawe St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	306	310	90	162	25	70	15	20	0	165	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.95		0.95		0.95		0.95	
Flow Rate	648		290		109		173	
% Heavy Veh	5		5		5		5	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	648		290		109		173	
Left-Turn	0		94		73		0	
Right-Turn	326		26		21		0	
Prop. Left-Turns	0.0		0.3		0.7		0.0	
Prop. Right-Turns	0.5		0.1		0.2		0.0	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	-0.2		0.1		0.1		0.1	

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	648		290		109		173	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.58		0.26		0.10		0.15	
hd, final value	5.25		6.09		7.12		6.88	
x, final value	0.94		0.49		0.22		0.33	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	3.2		4.1		5.1		4.9	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	648		290		109		173	
Service Time	3.2		4.1		5.1		4.9	
Utilization, x	0.94		0.49		0.22		0.33	
Dep. headway, hd	5.25		6.09		7.12		6.88	
Capacity	682		540		359		423	
Delay	65.32		14.90		12.07		13.26	
LOS	F		B		B		B	
Approach:								
Delay	65.32		14.90		12.07		13.26	
LOS	F		B		B		B	

Intersection Delay 41.20 Intersection LOS E

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Keawe St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	170	75	30	306	25	355	30	95	0	40	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.95		0.95		0.95		0.95	
Flow Rate	256		379		504		42	
% Heavy Veh	5		5		5		5	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	256		379		504		42	
Left-Turn	0		31		373		0	
Right-Turn	78		26		100		0	
Prop. Left-Turns	0.C		0.1		0.7		0.0	
Prop. Right-Turns	0.3		0.1		0.2		0.0	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	-0.1		0.1		0.1		0.1	

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	256		379		504		42	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.23		0.34		0.45		0.04	
hd, final value	6.47		6.36		6.14		7.38	
x, final value	0.46		0.67		0.86		0.09	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	4.5		4.4		4.1		5.4	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	256		379		504		42	
Service Time	4.5		4.4		4.1		5.4	
Utilization, x	0.46		0.67		0.86		0.09	
Dep. headway, hd	6.47		6.36		6.14		7.38	
Capacity	506		542		576		292	
Delay	14.96		21.94		42.42		11.07	
LOS	B		C		E		B	
Approach:								
Delay	14.96		21.94		42.42		11.07	
LOS	B		C		E		B	

Intersection Delay 28.78 Intersection LOS D

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Keawe St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
Volume	0	306	310	90	162	25	70	15	20	0	165	0
% Thrus Left Lane		85			50							

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	273	374	179	111	73	36	0	173
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	273	374	179	111	73	36	0	173
Left-Turn	0	0	94	0	73	0	0	0
Right-Turn	0	326	0	26	0	21	0	0
Prop. Left-Turns	0.0	0.0	0.5	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.9	0.0	0.2	0.0	0.6	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.5	0.3	-0.1	0.6	-0.3	0.1	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	273	374	179	111	73	36	0	173
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.24	0.33	0.16	0.10	0.06	0.03	0.00	0.15
hd, final value	5.97	5.36	6.61	6.19	7.61	6.71	6.98	6.98
x, final value	0.45	0.56	0.33	0.19	0.15	0.07	0.00	0.34
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.7	3.1	4.3	3.9	5.3	4.4	4.7	4.7

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	273	374	179	111	73	36	0	173
Service Time	3.7	3.1	4.3	3.9	5.3	4.4	4.7	4.7
Utilization, x	0.45	0.56	0.33	0.19	0.15	0.07	0.00	0.34
Dep. headway, hd	5.97	5.36	6.61	6.19	7.61	6.71	6.98	6.98
Capacity	523	624	429	361	323	286	0	423
Delay	13.57	14.72	12.54	10.34	11.70	9.89	9.68	13.19
LOS	B	B	B	B	B	A	A	B
Approach:								
Delay	14.24		11.70		11.10		13.19	
LOS	B		B		B		B	

Intersection Delay 13.21 Intersection LOS B

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Keawe St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
Volume	0	170	75	30	306	25	355	30	95	0	40	0
% Thrus Left Lane		85			50							

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	151	105	192	187	373	131	0	42
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	
Duration, T 1.00 hrs.								

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	151	105	192	187	373	131	0	42
Left-Turn	0	0	31	0	373	0	0	0
Right-Turn	0	78	0	26	0	100	0	0
Prop. Left-Turns	0.0	0.0	0.2	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.7	0.0	0.1	0.0	0.8	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.4	0.2	-0.0	0.6	-0.4	0.1	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	151	105	192	187	373	131	0	42
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.13	0.09	0.17	0.17	0.33	0.12	0.00	0.04
hd, final value	6.85	6.33	6.74	6.56	6.93	5.89	7.23	7.23
x, final value	0.29	0.18	0.36	0.34	0.72	0.21	0.00	0.08
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	4.5	4.0	4.4	4.3	4.6	3.6	4.9	4.9

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	151	105	192	187	373	131	0	42
Service Time	4.5	4.0	4.4	4.3	4.6	3.6	4.9	4.9
Utilization, x	0.29	0.18	0.36	0.34	0.72	0.21	0.00	0.08
Dep. headway, hd	6.85	6.33	6.74	6.56	6.93	5.89	7.23	7.23
Capacity	401	355	442	437	512	381	0	292
Delay	12.30	10.46	13.21	12.65	26.66	10.20	9.93	10.60
LOS	B	B	B	B	D	B	A	B
Approach:								
Delay	11.54		12.93		22.38		10.60	
LOS	B		B		C		B	

Intersection Delay 16.58 Intersection LOS C

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 5/3/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Coral St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	106	220	0	0	245	0	0	0	0	0	0	32
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT		TR				LR	
PHF	0.95		0.95				0.95	
Flow Rate	342		257				33	
% Heavy Veh	2		2				2	
No. Lanes	1		1				1	
Opposing-Lanes	1		1				0	
Conflicting-lanes	1		1				1	
Geometry group	1		1				1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	342		257				33	
Left-Turn	111		0				0	
Right-Turn	0		0				33	
Prop. Left-Turns	0.3		0.0				0.0	
Prop. Right-Turns	0.0		0.0				1.0	
Prop. Heavy Vehicle	0.0		0.0				0.0	
Geometry Group	1		1				1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2				0.2	
hRT-adj	-0.6		-0.6				-0.6	
hHV-adj	1.7		1.7				1.7	
hadj, computed	0.1		0.0				-0.6	

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	342		257				33	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.30		0.23				0.03	
hd, final value	4.35		4.37				4.64	
x, final value	0.41		0.31				0.04	
Move-up time, m	2.0		2.0				2.0	
Service Time	2.3		2.4				2.6	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	342		257				33	
Service Time	2.3		2.4				2.6	
Utilization, x	0.41		0.31				0.04	
Dep. headway, hd	4.35		4.37				4.64	
Capacity	592		507				283	
Delay	10.39		9.34				7.85	
LOS	B		A				A	
Approach:								
Delay	10.39		9.34				7.85	
LOS	B		A				A	

Intersection Delay 9.83 Intersection LOS A

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 5/3/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Coral St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	18	247	0	0	236	0	0	0	0	0	0	125
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT		TR				LR	
PHF	0.95		0.95				0.95	
Flow Rate	278		248				131	
% Heavy Veh	2		2				2	
No. Lanes	1		1				1	
Opposing-Lanes	1		1				0	
Conflicting-lanes	1		1				1	
Geometry group	1		1				1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	278		248				131	
Left-Turn	18		0				0	
Right-Turn	0		0				131	
Prop. Left-Turns	0.1		0.0				0.0	
Prop. Right-Turns	0.0		0.0				1.0	
Prop. Heavy Vehicle	0.0		0.0				0.0	
Geometry Group	1		1				1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2				0.2	
hRT-adj	-0.6		-0.6				-0.6	
hHV-adj	1.7		1.7				1.7	
hadj, computed	0.0		0.0				-0.6	

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	278		248				131	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.25		0.22				0.12	
hd, final value	4.55		4.57				4.54	
x, final value	0.35		0.32				0.17	
Move-up time, m	2.0		2.0				2.0	
Service Time	2.6		2.6				2.5	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	278		248				131	
Service Time	2.6		2.6				2.5	
Utilization, x	0.35		0.32				0.17	
Dep. headway, hd	4.55		4.57				4.54	
Capacity	528		498				381	
Delay	10.02		9.67				8.44	
LOS	B		A				A	
Approach:								
Delay	10.02		9.67				8.44	
LOS	B		A				A	

Intersection Delay 9.57 Intersection LOS A

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Coral St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	106	220			245	0
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	111	231			257	0
Percent Heavy Vehicles	5	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	2			2	0
Configuration	LT	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume				0		32
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				0		33
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	111					0		33
C(m) (vph)	1283					392		889
v/c	0.09					0.00		0.04
95% queue length	0.28					0.00		0.12
Control Delay	8.1					14.2		9.2
LOS	A					B		A
Approach Delay							9.2	
Approach LOS							A	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Coral St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	18	247			236	0
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	18	260			248	0
Percent Heavy Vehicles	5	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	2			2	0
Configuration	LT	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume				0		125
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				0		131
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	18					0		131
C(m) (vph)	1293					551		894
v/c	0.01					0.00		0.15
95% queue length	0.04					0.00		0.51
Control Delay	7.8					11.5		9.7
LOS	A					B		A
Approach Delay							9.7	
Approach LOS							A	

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Cooke St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	138	82	5	5	187	0	5	20	5	0	20	48
% Thrus Left Lane												

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.95		0.95		0.95		0.95	
Flow Rate	236		201		31		71	
% Heavy Veh	5		5		5		5	
No. Lanes		1		1		1		1
Opposing-Lanes		1		1		1		1
Conflicting-lanes		1		1		1		1
Geometry group		1		1		1		1
Duration, T 1.00 hrs.								

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	236		201		31		71	
Left-Turn	145		5		5		0	
Right-Turn	5		0		5		50	
Prop. Left-Turns	0.6		0.0		0.2		0.0	
Prop. Right-Turns	0.0		0.0		0.2		0.7	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group		1		1		1		1
Adjustments Exhibit 17-33:								
hLT-adj		0.2		0.2		0.2		0.2
hRT-adj		-0.6		-0.6		-0.6		-0.6
hHV-adj		1.7		1.7		1.7		1.7
hadj, computed	0.2		0.1		0.0		-0.3	

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	236		201		31		71	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.21		0.18		0.03		0.06	
hd, final value	4.58		4.51		5.04		4.63	
x, final value	0.30		0.25		0.04		0.09	
Move-up time, m		2.0		2.0		2.0		2.0
Service Time	2.6		2.5		3.0		2.6	

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	236		201		31		71	
Service Time	2.6		2.5		3.0		2.6	
Utilization, x	0.30		0.25		0.04		0.09	
Dep. headway, hd	4.58		4.51		5.04		4.63	
Capacity	486		451		281		321	
Delay	9.54		9.03		8.27		8.09	
LOS	A		A		A		A	
Approach:								
Delay		9.54		9.03		8.27		8.09
LOS		A		A		A		A

Intersection Delay 9.09 Intersection LOS A

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Cooke St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	34	213	0	0	81	0	5	30	5	0	10	155
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.95		0.95		0.95		0.95	
Flow Rate	259		85		41		173	
% Heavy Veh	5		5		5		5	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	259		85		41		173	
Left-Turn	35		0		5		0	
Right-Turn	0		0		5		163	
Prop. Left-Turns	0.1		0.0		0.1		0.0	
Prop. Right-Turns	0.0		0.0		0.1		0.9	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1		0.1		0.0		-0.5	

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	259		85		41		173	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.23		0.08		0.04		0.15	
hd, final value	4.62		4.81		5.00		4.32	
x, final value	0.33		0.11		0.06		0.21	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	2.6		2.8		3.0		2.3	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	259		85		41		173	
Service Time	2.6		2.8		3.0		2.3	
Utilization, x	0.33		0.11		0.06		0.21	
Dep. headway, hd	4.62		4.81		5.00		4.32	
Capacity	509		335		291		423	
Delay	9.92		8.42		8.30		8.44	
LOS	A		A		A		A	
Approach:								
Delay	9.92		8.42		8.30		8.44	
LOS	A		A		A		A	

Intersection Delay 9.12 Intersection LOS A

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Cooke St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
Volume	138	82	5	5	187	0	5	20	5	0	20	48
% Thrus Left Lane		50			50							

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	188	48	102	98	5	26	0	71
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	188	48	102	98	5	26	0	71
Left-Turn	145	0	5	0	5	0	0	0
Right-Turn	0	5	0	0	0	5	0	50
Prop. Left-Turns	0.8	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.7
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.5	0.0	0.1	0.1	0.6	-0.0	0.1	-0.4

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	188	48	102	98	5	26	0	71
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.17	0.04	0.09	0.09	0.00	0.02	0.00	0.06
hd, final value	5.42	4.96	5.10	5.07	6.22	5.59	5.68	5.19
x, final value	0.28	0.07	0.14	0.14	0.01	0.04	0.00	0.10
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.1	2.7	2.8	2.8	3.9	3.3	3.4	2.9

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	188	48	102	98	5	26	0	71
Service Time	3.1	2.7	2.8	2.8	3.9	3.3	3.4	2.9
Utilization, x	0.28	0.07	0.14	0.14	0.01	0.04	0.00	0.10
Dep. headway, hd	5.42	4.96	5.10	5.07	6.22	5.59	5.68	5.19
Capacity	438	298	352	348	255	276	0	321
Delay	10.25	8.01	8.66	8.58	8.98	8.52	8.38	8.48
LOS	B	A	A	A	A	A	A	A
Approach:								
Delay	9.80		8.62		8.60		8.48	
LOS	A		A		A		A	

Intersection Delay 9.12 Intersection LOS A

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2009 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Cooke St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	34	213	0	0	81	0	5	30	5	0	10	155
% Thrus Left Lane		50			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	146	112	42	43	5	36	0	173
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	146	112	42	43	5	36	0	173
Left-Turn	35	0	0	0	5	0	0	0
Right-Turn	0	0	0	0	0	5	0	163
Prop. Left-Turns	0.2	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.9
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.2	0.1	0.1	0.1	0.6	-0.0	0.1	-0.6

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	146	112	42	43	5	36	0	173
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.13	0.10	0.04	0.04	0.00	0.03	0.00	0.15
hd, final value	5.32	5.20	5.38	5.38	6.11	5.52	5.49	4.83
x, final value	0.22	0.16	0.06	0.06	0.01	0.06	0.00	0.23
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.0	2.9	3.1	3.1	3.8	3.2	3.2	2.5

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	146	112	42	43	5	36	0	173
Service Time	3.0	2.9	3.1	3.1	3.8	3.2	3.2	2.5
Utilization, x	0.22	0.16	0.06	0.06	0.01	0.06	0.00	0.23
Dep. headway, hd	5.32	5.20	5.38	5.38	6.11	5.52	5.49	4.83
Capacity	396	362	292	293	255	286	0	423
Delay	9.49	8.91	8.44	8.45	8.87	8.54	8.19	8.99
LOS	A	A	A	A	A	A	A	A
Approach:								
Delay	9.24		8.44		8.58		8.99	
LOS	A		A		A		A	

Intersection Delay 8.99 Intersection LOS A

APPENDIX E

CAPACITY ANALYSIS CALCULATIONS
YEAR 2014 PEAK HOUR TRAFFIC ANALYSIS
WITH PROJECT

```
                HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                               Inter.:
Agency:                                   Area Type: All other areas
Date:    02/01/05                         Jurisd:
Period: AM Peak                           Year  : Year 2014 w/ project
Project ID: w/out modifications
E/W St: Ala Moana Boulevard               N/S St: Punchbowl Street

__________________________SIGNALIZED INTERSECTION SUMMARY_____________________
           |  Eastbound     |  Westbound     |  Northbound    |  Southbound    |
           | L    T    R    | L    T    R    | L    T    R    | L    T    R    |
           |________________|________________|________________|________________|
No. Lanes  |  0    3    1   |  0    3    0   |  3    0    0   |  2    0    2   |
LGConfig   |       T    R   |       T        | L              | L         R    |
Volume     |     3032 1046  |     2222       |227             |214        163  |
Lane Width |     12.0 12.0  |     12.0       |12.0            |12.0       12.0 |
RTOR Vol   |          1046  |                |                |           16   |
______________________________________________________________________________
Duration     1.00       Area Type: All other areas
_________________________________Signal Operations____________________________
Phase Combination 1     2     3     4 |          5     6     7     8
EB  Left                              | NB  Left  A
    Thru          A                   |     Thru
    Right         A                   |     Right
    Peds                              |     Peds
WB  Left                              | SB  Left  A
    Thru          A                   |     Thru
    Right                             |     Right A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            93.5                           36.5
Yellow           4.0                            4.0
All Red          1.0                            1.0
                                                 Cycle Length: 140.0   secs
____________________Intersection Performance Summary__________________________
Appr/  Lane      Adj Sat     Ratios        Lane Group   Approach
Lane   Group     Flow Rate  ___________   ___________  ___________
Grp    Capacity    (s)      v/c    g/C     Delay LOS    Delay LOS
______________________________________________________________________________
Eastbound

T      3427      5131      0.98   0.67    41.0   D     41.0   D
R      1084      1623      0.00   0.67    7.7    A
Westbound

T      3427      5131      0.65   0.67    14.2   B     14.2   B

Northbound
L      1221      4683      0.21   0.26    40.5   D
                                                       40.5   D

Southbound
L      870       3338      0.27   0.26    41.3   D
                                                       41.1   D
R      710       2722      0.23   0.26    40.8   D
       Intersection Delay = 31.4  (sec/veh)   Intersection LOS = C
______________________________________________________________________________
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                HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                               Inter.:
Agency:                                   Area Type: All other areas
Date:    2/1/05                           Jurisd:
Period: PM Peak                           Year  : Year 2014 w/ project
Project ID: w/out modifications
E/W St: Ala Moana Boulevard               N/S St: Punchbowl Street

__________________________SIGNALIZED INTERSECTION SUMMARY_____________________
           |  Eastbound     |  Westbound     |  Northbound    |  Southbound    |
           | L    T    R    | L    T    R    | L    T    R    | L    T    R    |
           |________________|________________|________________|________________|
No. Lanes  |  0    3    1   |  0    3    0   |  3    0    0   |  2    0    1   |
LGConfig   |       T    R   |       T        | L              | L         R    |
Volume     |     2673 325   |     2859       |1205            |170        317  |
Lane Width |     12.0 12.0  |     12.0       |12.0            |12.0       12.0 |
RTOR Vol   |          325   |                |                |           32   |
______________________________________________________________________________
Duration     1.00       Area Type: All other areas
_________________________________Signal Operations____________________________
Phase Combination 1     2     3     4 |          5     6     7     8
EB  Left                              | NB  Left  A
    Thru          A                   |     Thru
    Right         A                   |     Right
    Peds                              |     Peds
WB  Left                              | SB  Left  A
    Thru          A                   |     Thru
    Right                             |     Right A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            83.5                           46.5
Yellow           4.0                            4.0
All Red          1.0                            1.0
                                                 Cycle Length: 140.0   secs
____________________Intersection Performance Summary__________________________
Appr/  Lane      Adj Sat     Ratios        Lane Group   Approach
Lane   Group     Flow Rate  ___________   ___________  ___________
Grp    Capacity    (s)      v/c    g/C     Delay LOS    Delay LOS
______________________________________________________________________________
Eastbound

T      3060      5131      0.95   0.60    35.5   D     35.5   D
R      968       1623      0.00   0.60    11.4   B
Westbound

T      3060      5131      0.98   0.60    47.8   D     47.8   D

Northbound
L      1555      4683      0.86   0.33    49.2   D
                                                       49.2   D

Southbound
L      1109      3338      0.17   0.33    33.2   C
                                                       38.8   D
R      511       1538      0.63   0.33    42.2   D
       Intersection Delay = 42.8  (sec/veh)   Intersection LOS = D
______________________________________________________________________________
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          HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                               Inter.:
Agency:                                   Area Type: All other areas
Date:    02/01/05                         Jurisd:
Period: AM Peak                           Year  : Year 2014 w/ project
Project ID:
E/W St: Ala Moana Boulevard               N/S St: Punchbowl Street

________________________SIGNALIZED INTERSECTION SUMMARY__________________________
           |  Eastbound     |  Westbound     |  Northbound    |  Southbound    |
           | L    T    R    | L    T    R    | L    T    R    | L    T    R    |
           |                |                |                |                |
No. Lanes  |  0    3    1   |  0    3    0   |  3    0    0   |  2    0    2   |
LGConfig   |       T    R   |       T        | L              | L         R    |
Volume     |     2602 1049  |     2210       |241             |214        163  |
Lane Width |     12.0 12.0  |     12.0       |12.0            |12.0       12.0 |
RTOR Vol   |          1049  |                |                |           16   |
_________________________________________________________________________________
Duration     1.00      Area Type: All other areas
______________________________Signal Operations__________________________________
Phase Combination 1     2     3     4  |      5     6     7     8
EB  Left                               | NB  Left   A
    Thru          A                    |     Thru
    Right         A                    |     Right
    Peds                               |     Peds
WB  Left                               | SB  Left   A
    Thru          A                    |     Thru
    Right                              |     Right  A
    Peds                               |     Peds
NB  Right                              | EB  Right
SB  Right                              | WB  Right
Green           84.0                              46.0
Yellow          4.0                               4.0
All Red         1.0                               1.0
                                                   Cycle Length: 140.0    secs
____________________Intersection Performance Summary____________________________
Appr/  Lane     Adj Sat    Ratios         Lane Group   Approach
Lane   Group    Flow Rate  _________      __________  __________
Grp    Capacity   (s)      v/c    g/C     Delay LOS   Delay LOS
_________________________________________________________________________________
Eastbound

T       3079     5131      0.94   0.60    33.3   C    33.3   C
R       974      1623      0.00   0.60    11.2   B
Westbound

T       3079     5131      0.72   0.60    20.7   C    20.7   C

Northbound
L       1539     4683      0.17   0.33    33.5   C
                                                      33.5   C

Southbound
L       1097     3338      0.21   0.33    34.0   C
                                                      33.9   C
R       894      2722      0.18   0.33    33.7   C
        Intersection Delay = 28.5  (sec/veh)   Intersection LOS = C
_________________________________________________________________________________
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          HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                               Inter.:
Agency:                                   Area Type: All other areas
Date:    2/1/05                           Jurisd:
Period: PM Peak                           Year  : Year 2014 w/ project
Project ID:
E/W St: Ala Moana Boulevard               N/S St: Punchbowl Street

________________________SIGNALIZED INTERSECTION SUMMARY__________________________
           |  Eastbound     |  Westbound     |  Northbound    |  Southbound    |
           | L    T    R    | L    T    R    | L    T    R    | L    T    R    |
           |                |                |                |                |
No. Lanes  |  0    3    1   |  0    3    0   |  3    0    0   |  2    0    2   |
LGConfig   |       T    R   |       T        | L              | L         R    |
Volume     |     2391 332   |     2693       |1379            |170        317  |
Lane Width |     12.0 12.0  |     12.0       |12.0            |12.0       12.0 |
RTOR Vol   |          332   |                |                |           32   |
_________________________________________________________________________________
Duration     1.00      Area Type: All other areas
______________________________Signal Operations__________________________________
Phase Combination 1     2     3     4  |      5     6     7     8
EB  Left                               | NB  Left   A
    Thru          A                    |     Thru
    Right         A                    |     Right
    Peds                               |     Peds
WB  Left                               | SB  Left   A
    Thru          A                    |     Thru
    Right                              |     Right  A
    Peds                               |     Peds
NB  Right                              | EB  Right
SB  Right                              | WB  Right
Green           79.5                              50.5
Yellow          4.0                               4.0
All Red         1.0                               1.0
                                                   Cycle Length: 140.0    secs
____________________Intersection Performance Summary____________________________
Appr/  Lane     Adj Sat    Ratios         Lane Group   Approach
Lane   Group    Flow Rate  _________      __________  __________
Grp    Capacity   (s)      v/c    g/C     Delay LOS   Delay LOS
_________________________________________________________________________________
Eastbound

T       2914     5131      0.89   0.57    30.6   C    30.6   C
R       922      1623      0.00   0.57    13.1   B
Westbound

T       2914     5131      0.97   0.57    45.2   D    45.2   D

Northbound
L       1774     4917      0.86   0.36    46.5   D
                                                      46.5   D

Southbound
L       1204     3338      0.16   0.36    30.4   C
                                                      31.8   C
R       982      2722      0.33   0.36    32.7   C
        Intersection Delay = 39.5  (sec/veh)   Intersection LOS = D
_________________________________________________________________________________
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HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: AM Peak
Project ID: w/out modifications
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: South Street/Forrest Ave

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	0	3	0	0	1	0	0	1	1
LGConfig	L	TR			TR			LTR			LT	R
Volume	281	2890	69		1992	143	45	38	0	11	77	39
Lane Width	12.0	12.0			12.0			12.0			12.0	12.0
RTOR Vol			7			14			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A	A			Thru	A			
Right	A	A			Right	A			
Peds					Peds				
WB Left					SB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	41.0	75.0				34.0			
Yellow	0.0	4.0				4.0			
All Red	0.0	1.0				1.0			

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	465	1814	0.63	0.26	55.6	E		
TR	3708	5115	0.83	0.73	16.9	B	20.3	C
Westbound								
TR	2383	5084	0.96	0.47	54.4	D	54.4	D
Northbound								
LTR	246	1156	0.43	0.21	55.9	E	55.9	E
Southbound								
LT	370	1740	0.28	0.21	53.1	D	52.6	D
R	327	1538	0.14	0.21	51.3	D		

Intersection Delay = 34.9 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: PM Peak
Project ID: w/out modification
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: South Street/Forrest Ave

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	0	3	0	0	1	0	0	1	1
LGConfig	L	TR			TR			LTR			LT	R
Volume	235	3027	6		2396	92	95	115	0	47	13	267
Lane Width	12.0	12.0			12.0			12.0			12.0	12.0
RTOR Vol			1			9			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A	A			Thru	A			
Right	A	A			Right	A			
Peds					Peds				
WB Left					SB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	30.0	80.0				40.0			
Yellow	0.0	4.0				4.0			
All Red	0.0	1.0				1.0			

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	340	1814	0.80	0.19	76.5	E		
TR	3527	5130	1.00	0.69	55.0+	E	56.6	E
Westbound								
TR	2553	5105	1.00	0.50	76.7	E	76.7	E
Northbound								
LTR	333	1333	0.77	0.25	66.9	E	66.9	E
Southbound								
LT	277	1108	0.27	0.25	48.7	D	72.2	E
R	385	1538	0.86	0.25	77.5	E		

Intersection Delay = 65.2 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: AM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: South Street/Forrest Ave

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	3	0	0	3	0	0	1	0	0	1	1
LGConfig		TR			TR			LTR			LT	R
Volume		2741	69		1980	143	45	49	0	98	77	39
Lane Width		12.0			12.0			12.0			12.0	12.0
RTOR Vol			7			14			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left					SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	83.5					46.5			
Yellow	4.0					4.0			
All Red	1.0					1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
TR	3050	5114	0.96	0.60	37.4	D	37.4	D
Westbound								
TR	3032	5084	0.75	0.60	21.7	C	21.7	C
Northbound								
LTR	406	1222	0.30	0.33	35.1	D	35.1	D
Southbound								
LT	454	1368	0.45	0.33	37.4	D	36.5	D
R	511	1538	0.09	0.33	32.2	C		

Intersection Delay = 30.9 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: PM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: South Street/Forrest Ave

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	3	0	0	3	0	0	1	0	0	1	1
LGConfig		TR			TR			LTR			LT	R
Volume		2980	6		2240	92	95	121	0	109	13	267
Lane Width		12.0			12.0			12.0			12.0	12.0
RTOR Vol			1			9			0			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left					SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	90.0					40.0			
Yellow	4.0					4.0			
All Red	1.0					1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
TR	3298	5130	1.01	0.64	62.0	E	62.0	E
Westbound								
TR	3280	5103	0.73	0.64	17.7	B	17.7	B
Northbound								
LTR	322	1128	0.82	0.29	64.0	E	64.0	E
Southbound								
LT	278	973	0.54	0.29	44.5	D	50.3	D
R	439	1538	0.75	0.29	53.0	D		

Intersection Delay = 44.8 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: AM Peak
Project ID: w/out modifications
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: Keawe Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	149	2557	66	73	2173	48	13	17	21	16	71	56
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			7			5			2			6

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
WB Left	A				SB Left		A		
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	16.0	74.0				9.0	21.0		
Yellow	4.0	4.0				4.0	4.0		
All Red	1.0	1.0				1.0	1.0		

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	207	1814	0.75	0.11	75.3	E		
TR	2703	5114	1.01	0.53	75.9	E	75.8	E
Westbound								
L	207	1814	0.37	0.11	58.5	E		
TR	2704	5116	0.86	0.53	31.8	C	32.7	C
Northbound								
LTR	109	1692	0.64	0.06	76.8	E	76.8	E
Southbound								
LTR	257	1710	0.82	0.15	79.4	E	79.4	E

Intersection Delay = 57.3 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: PM Peak
Project ID: w/out modifications
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: Keawe Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	47	2664	30	10	2345	80	60	44	91	41	21	158
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			3			8			9			16

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
WB Left	A				SB Left		A		
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	5.5	75.0				18.5	21.0		
Yellow	4.0	4.0				4.0	4.0		
All Red	1.0	1.0				1.0	1.0		

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	71	1814	0.69	0.04	94.2	F		
TR	2744	5123	1.02	0.54	91.6	F	91.7	F
Westbound								
L	71	1814	0.15	0.04	66.0	E		
TR	2736	5108	0.93	0.54	37.4	D	37.5	D
Northbound								
LTR	221	1675	0.88	0.13	101.4	F	101.4	F
Southbound								
LTR	243	1623	0.88	0.15	96.1	F	96.1	F

Intersection Delay = 68.4 (sec/veh) Intersection LOS = E

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Keawe St
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1715	137		1449	48
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		1805	144		1525	50
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			21			56
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			22			58
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					22			58
C(m) (vph)					333			426
v/c					0.07			0.14
95% queue length					0.21			0.47
Control Delay					16.6			14.8
LOS					C			B
Approach Delay				16.6			14.8	
Approach LOS				C			B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Keawe St
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1803	51		1499	80
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		1897	53		1577	84
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			91			158
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			95			166
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					95			166
C(m) (vph)					332			403
v/c					0.29			0.41
95% queue length					1.19			2.07
Control Delay					20.2			20.2
LOS					C			C
Approach Delay				20.2			20.2	
Approach LOS				C			C	

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: AM Peak
Project ID: w/out modifications
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: Coral Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	68	2288	250	142	2276	32	21	16	15	18	59	23
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			25			3			2			2

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	26.5	74.0				24.5			
Yellow	4.0	4.0				4.0			
All Red	1.0	1.0				1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	343	1814	0.21	0.19	48.2	D		
TR	2676	5062	0.98	0.53	51.6	D	51.5	D
Westbound								
L	343	1814	0.43	0.19	51.0	D		
TR	2707	5121	0.90	0.53	34.3	C	35.3	D
Northbound								
LTR	251	1434	0.30	0.17	51.0	D	51.0	D
Southbound								
LTR	288	1648	0.44	0.17	52.7	D	52.7	D

Intersection Delay = 43.9 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: PM Peak
Project ID: w/out modifications
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: Coral Street

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	0	1	0	0	1	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	29	2774	57	39	2286	22	165	65	107	16	28	51
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			6			2			11			5

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A	A		
Thru		A			Thru	A	A		
Right		A			Right	A	A		
Peds					Peds				
WB Left	A				SB Left		A		
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	5.5	81.0				26.5	12.0		
Yellow	4.0	4.0				0.0	4.0		
All Red	1.0	1.0				0.0	1.0		

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	71	1814	0.44	0.04	70.0	E		
TR	2961	5117	1.03	0.58	93.8	F	93.5	F
Westbound								
L	71	1814	0.65	0.04	86.7	F		
TR	2965	5124	0.93	0.58	33.2	C	34.0	C
Northbound								
LTR	409	1695	0.94	0.28	92.1	F	92.1	F
Southbound								
LTR	124	1447	0.77	0.09	92.7	F	92.7	F

Intersection Delay = 67.2 (sec/veh) Intersection LOS = E

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Coral St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		1571	250		1483	32
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		1653	263		1561	33
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume			15			23
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			15			24
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes		1			1	
Configuration		R			R	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					15			24
C(m) (vph)					340			421
v/c					0.04			0.06
95% queue length					0.14			0.18
Control Delay					16.1			14.1
LOS					C			B
Approach Delay				16.1			14.1	
Approach LOS				C			B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Coral St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		1869	57		1563	22
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		1967	60		1645	23
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume			107			51
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			112			53
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes		1			1	
Configuration		R			R	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					112			53
C(m) (vph)					316			401
v/c					0.35			0.13
95% queue length					1.62			0.46
Control Delay					22.6			15.3
LOS					C			C
Approach Delay				22.6			15.3	
Approach LOS				C			C	

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                HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                              Inter.:
Agency:                                  Area Type: All other areas
Date:    3/14/2005                       Jurisd:
Period: AM Peak                          Year  : Year 2014 w/ project
Project ID: w/out modifications
E/W St: Ala Moana Blvd                   N/S St: Cooke St

_________________________SIGNALIZED INTERSECTION SUMMARY_______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound    |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R    |
           |_______________|_______________|_______________|________________|
No. Lanes  |  1    3    0  |  1    3    0  |  0    1    1  |  0    1    1   |
LGConfig   | L     TR      | L     TR      |      LT   R   |      LT   R    |
Volume     |86   2030 206  |130  2374 72   |24   31   24   |54   84   39    |
Lane Width |12.0 12.0      |12.0 12.0      |     12.0 12.0 |     12.0 12.0  |
RTOR Vol   |          21   |          7    |          2    |          4     |
______________________________________________________________________________
Duration     1.00       Area Type: All other areas
______________________________Signal Operations________________________________
Phase Combination 1     2     3     4 |           5     6     7     8
EB  Left          A                   | NB  Left  A
    Thru                A             |     Thru  A
    Right               A             |     Right A
    Peds                              |     Peds
WB  Left          A                   | SB  Left  A
    Thru                A             |     Thru  A
    Right               A             |     Right A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            24.5  72.0                     28.5
Yellow           4.0   4.0                      4.0
All Red          1.0   1.0                      1.0
                                            Cycle Length: 140.0   secs
____________________Intersection Performance Summary__________________________
Appr/  Lane      Adj Sat    Ratios       Lane Group    Approach
Lane   Group     Flow Rate  __________   __________    __________
Grp    Capacity    (s)      v/c    g/C   Delay LOS     Delay LOS
______________________________________________________________________________
Eastbound
L        317       1814     0.29   0.17  50.7   D
TR       2606      5067     0.89   0.51  35.4   D      36.0   D

Westbound
L        317       1814     0.43   0.17  52.5   D
TR       2629      5111     0.98   0.51  52.1   D      52.1   D

Northbound

LT       274       1348     0.27   0.20  47.5   D      46.9   D
R        313       1538     0.09   0.20  45.4   D
Southbound

LT       309       1520     0.60   0.20  53.7   D      52.1   D
R        313       1538     0.15   0.20  46.0   D
         Intersection Delay = 44.8  (sec/veh)   Intersection LOS = D
______________________________________________________________________________
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                HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                              Inter.:
Agency:                                  Area Type: All other areas
Date:    3/14/2005                       Jurisd:
Period: PM Peak                          Year  : Year 2014 w/ project
Project ID: w/out modifications
E/W St: Ala Moana Blvd                   N/S St: Cooke St

_________________________SIGNALIZED INTERSECTION SUMMARY_______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound    |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R    |
           |_______________|_______________|_______________|________________|
No. Lanes  |  1    3    0  |  1    3    0  |  0    1    1  |  0    1    1   |
LGConfig   | L     TR      | L     TR      |      LT   R   |      LT   R    |
Volume     |95   2258 48   |26   2076 81   |151  80   91   |46   37   119   |
Lane Width |12.0 12.0      |12.0 12.0      |     12.0 12.0 |     12.0 12.0  |
RTOR Vol   |          5    |          8    |          9    |          12    |
______________________________________________________________________________
Duration     1.00       Area Type: All other areas
______________________________Signal Operations________________________________
Phase Combination 1     2     3     4 |           5     6     7     8
EB  Left          A                   | NB  Left  A     A
    Thru                A             |     Thru  A     A
    Right               A             |     Right A     A
    Peds                              |     Peds
WB  Left          A                   | SB  Left        A
    Thru                A             |     Thru        A
    Right               A             |     Right       A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            15.0  70.0                     20.5  19.5
Yellow           4.0   4.0                      0.0   4.0
All Red          1.0   1.0                      0.0   1.0
                                            Cycle Length: 140.0   secs
____________________Intersection Performance Summary__________________________
Appr/  Lane      Adj Sat    Ratios       Lane Group    Approach
Lane   Group     Flow Rate  __________   __________    __________
Grp    Capacity    (s)      v/c    g/C   Delay LOS     Delay LOS
______________________________________________________________________________
Eastbound
L        194       1814     0.52   0.11  61.5   E
TR       2559      5117     0.95   0.50  43.5   D      44.2   D

Westbound
L        194       1814     0.16   0.11  57.2   E
TR       2553      5105     0.99   0.50  62.1   E      62.1   E

Northbound

LT       368       1752     0.84   0.29  64.6   E      57.8   E
R        439       1538     0.25   0.29  38.7   D
Southbound

LT       168       1208     0.65   0.14  66.3   E      65.7   E
R        214       1538     0.67   0.14  65.2   E
         Intersection Delay = 54.1  (sec/veh)   Intersection LOS = D
______________________________________________________________________________
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HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 3/14/2005
Period: AM Peak
Project ID:
E/W St: Ala Moana Blvd

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: Cooke St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	1	1	1	1	1	0
LGConfig	L	TR		L	TR		L	T	R	L	TR	
Volume	177	1988	206	171	2135	72	70	65	24	82	178	39
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			21			7			12			4

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	20.0	64.5				12.0	23.5		
Yellow	4.0	4.0				4.0	4.0		
All Red	1.0	1.0				1.0	1.0		

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	259	1814	0.72	0.14	67.0	E		
TR	2334	5065	0.98	0.46	59.8	E	60.3	E
Westbound								
L	259	1814	0.69	0.14	65.3	E		
TR	2353	5108	0.98	0.46	61.8	E	62.1	E
Northbound								
L	147	1719	0.50	0.09	63.9	E		
T	304	1810	0.22	0.17	50.7	D	56.9	E
R	258	1538	0.05	0.17	49.0	D		
Southbound								
L	147	1719	0.59	0.09	67.6	E		
TR	296	1765	0.76	0.17	67.0	E	67.2	E

Intersection Delay = 61.4 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 3/14/2005
Period: PM Peak
Project ID:
E/W St: Ala Moana Blvd

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: Cooke St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	1	1	1	1	1	0
LGConfig	L	TR		L	TR		L	T	R	L	TR	
Volume	161	2205	48	37	2026	81	221	205	91	94	79	119
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			5			8			46			12

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A	A			NB Left	A	A		
Thru		A	A		Thru		A	A	
Right		A	A		Right		A	A	
Peds					Peds				
WB Left	A				SB Left	A			
Thru			A		Thru			A	
Right			A		Right			A	
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	8.0	11.5	62.0			14.0	11.0	23.5	
Yellow	0.0	0.0	4.0			0.0	0.0	4.0	
All Red	0.0	0.0	1.0			0.0	0.0	1.0	

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	253	1814	0.67	0.14	64.0	E		
TR	2686	5116	0.88	0.52	33.3	C	35.4	D
Westbound								
L	104	1814	0.38	0.06	65.9	E		
TR	2260	5104	0.98	0.44	60.2	E	60.3	E
Northbound								
L	307	1719	0.76	0.18	65.9	E		
T	446	1810	0.48	0.25	46.0	D	54.9	D
R	379	1538	0.12	0.25	41.2	D		
Southbound								
L	172	1719	0.58	0.10	64.9	E		
TR	277	1653	0.71	0.17	63.4	E	63.9	E

Intersection Delay = 48.7 (sec/veh) Intersection LOS = D

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HCS2000: Unsignalized Intersections Release 4.1d

____________________TWO-WAY STOP CONTROL SUMMARY__________________________

Analyst:              CL
Agency/Co.:
Date Performed:       2/1/05
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year:        Year 2014 w/ project
Project ID:  w/out modifications
East/West Street:     Ala Moana Boulevard
North/South Street:   Ohe Street
Intersection Orientation: EW               Study period (hrs):  1.00

___________________Vehicle Volumes and Adjustments_________________________
Major Street:  Approach       Eastbound              Westbound
               Movement     1       2      3     |  4      5        6
                            L       T      R     |  L      T        R
___________________________________________________________________________
Volume                              1439   23              1674     0
Peak-Hour Factor, PHF               0.94   0.94            0.95     0.95
Hourly Flow Rate, HFR               1530   24              1762     0
Percent Heavy Vehicles              --     --              --       --
Median Type/Storage         Undivided              /
RT Channelized?
Lanes                               2     0                2     0
Configuration                       T    TR                T    TR
Upstream Signal?                     No                     No
___________________________________________________________________________
Minor Street:  Approach       Northbound              Southbound
               Movement     7       8      9     |  10     11       12
                            L       T      R     |  L      T        R
___________________________________________________________________________
Volume                                     2                        4
Peak Hour Factor, PHF                      0.50                     0.33
Hourly Flow Rate, HFR                      4                        12
Percent Heavy Vehicles                     5                        5
Percent Grade (%)                   0                      0
Flared Approach:  Exists?/Storage                /                        /
Lanes                                   1                      1
Configuration                          R                      R
___________________________________________________________________________

________________Delay, Queue Length, and Level of Service__________________
Approach       EB     WB           Northbound            Southbound
Movement       1      4    |  7       8       9    |  10      11      12
Lane Config                |                  R    |                  R
___________________________________________________________________________
v (vph)                                       4                       12
C(m) (vph)                                    333                     284
v/c                                           0.01                    0.04
95% queue length                              0.04                    0.13
Control Delay                                 15.9                    18.2
LOS                                            C                       C
Approach Delay                           15.9                    18.2
Approach LOS                              C                       C
___________________________________________________________________________
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HCS2000: Unsignalized Intersections Release 4.1d

____________________TWO-WAY STOP CONTROL SUMMARY__________________________

Analyst:              CL
Agency/Co.:
Date Performed:       2/1/05
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year:        Year 2014 w/ project
Project ID:  w/out modifications
East/West Street:     Ala Moana Boulevard
North/South Street:   Ohe Street
Intersection Orientation: EW               Study period (hrs):  1.00

___________________Vehicle Volumes and Adjustments_________________________
Major Street:  Approach       Eastbound              Westbound
               Movement     1       2      3     |  4      5        6
                            L       T      R     |  L      T        R
___________________________________________________________________________
Volume                              1813   26              1565     0
Peak-Hour Factor, PHF               0.97   0.97            0.94     0.94
Hourly Flow Rate, HFR               1869   26              1664     0
Percent Heavy Vehicles              --     --              --       --
Median Type/Storage         Undivided              /
RT Channelized?
Lanes                               2     0                2     0
Configuration                       T    TR                T    TR
Upstream Signal?                     No                     No
___________________________________________________________________________
Minor Street:  Approach       Northbound              Southbound
               Movement     7       8      9     |  10     11       12
                            L       T      R     |  L      T        R
___________________________________________________________________________
Volume                                     31                       2
Peak Hour Factor, PHF                      0.83                     0.25
Hourly Flow Rate, HFR                      37                       8
Percent Heavy Vehicles                     5                        5
Percent Grade (%)                   0                      0
Flared Approach:  Exists?/Storage                /                        /
Lanes                                   1                      1
Configuration                          R                      R
___________________________________________________________________________

________________Delay, Queue Length, and Level of Service__________________
Approach       EB     WB           Northbound            Southbound
Movement       1      4    |  7       8       9    |  10      11      12
Lane Config                |                  R    |                  R
___________________________________________________________________________
v (vph)                                       37                      8
C(m) (vph)                                    256                     306
v/c                                           0.14                    0.03
95% queue length                              0.50                    0.08
Control Delay                                 21.4                    17.1
LOS                                            C                       C
Approach Delay                           21.4                    17.1
Approach LOS                              C                       C
___________________________________________________________________________
```

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 2/1/05
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/out project
Project ID:
East/West Street: Ala Moana Boulevard
North/South Street: Ohe Street
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		1430	23		1542	0
Peak-Hour Factor, PHF		0.94	0.94		0.95	0.95
Hourly Flow Rate, HFR		1521	24		1623	0
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume			2			4
Peak Hour Factor, PHF			0.50			0.33
Hourly Flow Rate, HFR			4			12
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					4			12
C(m) (vph)					336			316
v/c					0.01			0.04
95% queue length					0.04			0.12
Control Delay					15.8			16.8
LOS					C			C
Approach Delay				15.8			16.8	
Approach LOS				C			C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 2/1/05
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/out project
Project ID:
East/West Street: Ala Moana Boulevard
North/South Street: Ohe Street
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		1810	26		1539	0
Peak-Hour Factor, PHF		0.97	0.97		0.94	0.94
Hourly Flow Rate, HFR		1865	26		1637	0
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume			32			2
Peak Hour Factor, PHF			0.83			0.25
Hourly Flow Rate, HFR			38			8
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					38			8
C(m) (vph)					257			313
v/c					0.15			0.03
95% queue length					0.52			0.08
Control Delay					21.4			16.8
LOS					C			C
Approach Delay				21.4			16.8	
Approach LOS				C			C	

```
              HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                             Inter.:
Agency:                                 Area Type: All other areas
Date:    2/1/05                         Jurisd:
Period: AM Peak                         Year  : Year 2014 w/ project
Project ID: w/out modifications
E/W St: Ala Moana Boulevard             N/S St: Koula Street

                         SIGNALIZED INTERSECTION SUMMARY
            |  Eastbound     |  Westbound     |  Northbound    |  Southbound    |
            | L    T    R    | L    T    R    | L    T    R    | L    T    R    |
            |________________|________________|________________|________________|
No. Lanes   |   1    3    0  |   1    3    0  |   0    1    0  |   0    1    0  |
LGConfig    | L      TR      | L      TR      |       LTR      |       LTR      |
Volume      |23    1987 5   |3     2463 15   |24    7     16  |9     6     15  |
Lane Width  |12.0 12.0       |12.0 12.0       |      12.0      |      12.0      |
RTOR Vol    |           1    |           2    |           2    |           2    |

Duration     1.00       Area Type: All other areas
                              Signal Operations
Phase Combination 1     2     3     4  |      5     6     7     8
EB  Left          A                    | NB  Left   A
    Thru                A              |     Thru   A
    Right               A              |     Right  A
    Peds                               |     Peds
WB  Left          A                    | SB  Left   A
    Thru                A              |     Thru   A
    Right               A              |     Right  A
    Peds                               |     Peds
NB  Right                              | EB  Right
SB  Right                              | WB  Right
Green            32.0  82.0                       31.0
Yellow           4.0   4.0                        4.0
All Red          1.0   1.0                        1.0
                                             Cycle Length: 160.0    secs
                    Intersection Performance Summary
Appr/   Lane        Adj Sat     Ratios       Lane Group    Approach
Lane    Group       Flow Rate
Grp     Capacity      (s)      v/c    g/C    Delay LOS     Delay LOS

Eastbound
L       363         1814       0.07   0.20   52.0   D
TR      2629        5130       0.81   0.51   34.8   C      35.0-   C

Westbound
L       363         1814       0.01   0.20   51.3   D
TR      2628        5127       0.97   0.51   54.5   D      54.5    D

Northbound

LTR     284         1468       0.20   0.19   54.5   D      54.5    D

Southbound

LTR     301         1554       0.15   0.19   53.8   D      53.8    D

        Intersection Delay = 45.7  (sec/veh)   Intersection LOS = D
```

```
              HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                             Inter.:
Agency:                                 Area Type: All other areas
Date:    2/1/05                         Jurisd:
Period: PM Peak                         Year  : Year 2014 w/ project
Project ID: w/out modifications
E/W St: Ala Moana Boulevard             N/S St: Koula Street

                         SIGNALIZED INTERSECTION SUMMARY
            |  Eastbound     |  Westbound     |  Northbound    |  Southbound    |
            | L    T    R    | L    T    R    | L    T    R    | L    T    R    |
            |________________|________________|________________|________________|
No. Lanes   |   1    3    0  |   1    3    0  |   0    1    0  |   0    1    0  |
LGConfig    | L      TR      | L      TR      |       LTR      |       LTR      |
Volume      |37    2676 27   |13    2328 54   |11    10    7   |32    9     20  |
Lane Width  |12.0 12.0       |12.0 12.0       |      12.0      |      12.0      |
RTOR Vol    |           3    |           5    |           1    |           2    |

Duration     1.00       Area Type: All other areas
                              Signal Operations
Phase Combination 1     2     3     4  |      5     6     7     8
EB  Left          A                    | NB  Left   A
    Thru                A              |     Thru   A
    Right               A              |     Right  A
    Peds                               |     Peds
WB  Left          A                    | SB  Left   A
    Thru                A              |     Thru   A
    Right               A              |     Right  A
    Peds                               |     Peds
NB  Right                              | EB  Right
SB  Right                              | WB  Right
Green            26.0  91.5                       27.5
Yellow           4.0   4.0                        4.0
All Red          1.0   1.0                        1.0
                                             Cycle Length: 160.0    secs
                    Intersection Performance Summary
Appr/   Lane        Adj Sat     Ratios       Lane Group    Approach
Lane    Group       Flow Rate
Grp     Capacity      (s)      v/c    g/C    Delay LOS     Delay LOS

Eastbound
L       295         1814       0.14   0.16   57.6   E
TR      2930        5124       0.99   0.57   59.4   E      59.4    E

Westbound
L       295         1814       0.05   0.16   56.6   E
TR      2925        5115       0.87   0.57   32.7   C      32.8    C

Northbound

LTR     269         1566       0.14   0.17   56.4   E      56.4    E

Southbound

LTR     249         1447       0.27   0.17   58.2   E      58.2    E

        Intersection Delay = 47.2  (sec/veh)   Intersection LOS = D
```

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Koula St
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1331	5		1526	15
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		1401	5		1606	15
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			16			15
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			16			15
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					16			15
C(m) (vph)					476			413
v/c					0.03			0.04
95% queue length					0.10			0.11
Control Delay					12.8			14.0
LOS					B			B
Approach Delay				12.8			14.0	
Approach LOS				B			B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Koula St
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1805	27		1533	54
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		1900	28		1613	56
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			7			20
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			7			21
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					7			21
C(m) (vph)					337			401
v/c					0.02			0.05
95% queue length					0.06			0.17
Control Delay					15.9			14.5
LOS					C			B
Approach Delay				15.9			14.5	
Approach LOS				C			B	

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: AM Peak
Project ID: w/out modifications
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: Ward Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	0	1	3	1	0	2	1	1	2	0
LGConfig	L	TR		L	T	R		LT	R	L	LTR	
Volume	299	1858	2	235	2150	150	40	58	78	158	111	245
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0	12.0	12.0	12.0	
RTOR Vol			0			15			8			25

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left		A		
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru	A			
Right		A			Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	32.0	73.0				22.5	12.5		
Yellow	4.0	4.0				4.0	4.0		
All Red	1.0	1.0				1.0	1.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	363	1814	0.89	0.20	90.4	F		
TR	2341	5130	0.85	0.46	42.2	D	48.9	D
Westbound								
L	363	1814	0.71	0.20	66.3	E		
T	2341	5131	1.01	0.46	90.3	F	84.6	F
R	740	1623	0.20	0.46	26.2	C		
Northbound								
LT	264	3376	0.46	0.08	71.8	E	80.9	F
R	120	1538	0.73	0.08	93.7	F		
Southbound								
L	242	1719	0.52	0.14	65.8	E		
LTR	439	3122	0.90	0.14	94.0	F	87.2	F

Intersection Delay = 70.5 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: PM Peak
Project ID: w/out modifications
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: Ward Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	3	0	1	3	1	0	2	1	1	2	0
LGConfig	L	TR		L	T	R		LT	R	L	LTR	
Volume	294	2536	14	133	1568	284	185	157	343	250	80	326
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0	12.0	12.0	12.0	
RTOR Vol			1			28			172			33

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A	A			NB Left		A		
Thru		A	A		Thru		A		
Right		A	A		Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru			A		Thru	A			
Right			A		Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	15.0	16.0	66.5			26.0	21.5		
Yellow	0.0	0.0	4.0			4.0	4.0		
All Red	0.0	0.0	1.0			1.0	1.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	351	1814	0.89	0.19	93.2	F		
TR	2644	5127	1.03	0.52	104.2	F	103.1	F
Westbound								
L	170	1814	0.85	0.09	112.4	F		
T	2133	5131	0.80	0.42	43.2	D	46.6	D
R	675	1623	0.41	0.42	33.4	C		
Northbound								
LT	451	3354	0.80	0.13	77.7	E	87.6	F
R	207	1538	0.87	0.13	107.4	F		
Southbound								
L	279	1719	0.73	0.16	73.7	E		
LTR	500	3076	0.95	0.16	107.0	F	97.0	F

Intersection Delay = 82.3 (sec/veh) Intersection LOS = F

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                HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                                Inter.:
Agency:                                    Area Type: All other areas
Date:    2/1/05                            Jurisd:
Period: AM Peak                            Year   : Year 2014 w/ project
Project ID:
E/W St: Ala Moana Boulevard                N/S St: Ward Avenue

_____________________SIGNALIZED INTERSECTION SUMMARY___________________________
              |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
              | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
              |_______________|_______________|_______________|_______________|
No. Lanes     |   1    3    0 |   2    3    1 |   2    1    1 |   2    1    1 |
LGConfig      |  L    TR      |  L    T    R  |  L    T    R  |  L    T    R  |
Volume        |299  1858 2    |377  1983 150  |40   58   78   |158  146  235  |
Lane Width    |12.0 12.0      |12.0 12.0 12.0 |12.0 12.0 12.0 |12.0 12.0 12.0 |
RTOR Vol      |           0   |          15   |          40   |          118  |
_______________________________________________________________________________
Duration     1.00      Area Type: All other areas
______________________________Signal Operations_________________________________
Phase Combination 1     2     3     4 |          5     6     7     8
EB  Left          A                   | NB  Left A
    Thru                A             |     Thru       A
    Right               A             |     Right      A
    Peds                              |     Peds
WB  Left          A                   | SB  Left A
    Thru                A             |     Thru       A
    Right               A             |     Right      A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            35.5  69.0                    15.0  20.5
Yellow           4.0   4.0                     4.0   4.0
All Red          1.0   1.0                     1.0   1.0
                                                Cycle Length: 160.0    secs
_________________________Intersection Performance Summary_______________________
Appr/   Lane      Adj Sat     Ratios       Lane Group    Approach
Lane    Group     Flow Rate  _____________  ___________   ___________
Grp     Capacity    (s)      v/c    g/C    Delay LOS    Delay LOS
_______________________________________________________________________________
Eastbound
L        402       1814       0.80   0.22   70.9   E
TR       2212      5130       0.90   0.43   48.7   D     51.8    D

Westbound
L        781       3522       0.53   0.22   55.6   E
T        2213      5131       0.98   0.43   71.1   E     66.5    E
R        700       1623       0.21   0.43   28.6   C
Northbound
L        313       3338       0.16   0.09   66.9   E
T        232       1810       0.31   0.13   64.1   E     64.7    E
R        197       1538       0.24   0.13   63.4   E
Southbound
L        313       3338       0.54   0.09   71.0   E
T        232       1810       0.67   0.13   73.9   E     72.5    E
R        197       1538       0.63   0.13   72.6   E
        Intersection Delay = 60.9  (sec/veh)   Intersection LOS = E
_______________________________________________________________________________
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                HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                                Inter.:
Agency:                                    Area Type: All other areas
Date:    2/1/05                            Jurisd:
Period: PM Peak                            Year   : Year 2014 w/ project
Project ID:
E/W St: Ala Moana Boulevard                N/S St: Ward Avenue

_____________________SIGNALIZED INTERSECTION SUMMARY___________________________
              |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
              | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
              |_______________|_______________|_______________|_______________|
No. Lanes     |   1    3    0 |   2    3    1 |   2    1    1 |   2    1    1 |
LGConfig      |  L    TR      |  L    T    R  |  L    T    R  |  L    T    R  |
Volume        |294  2536 14   |166  1527 281  |185  157  343  |250  88   326  |
Lane Width    |12.0 12.0      |12.0 12.0 12.0 |12.0 12.0 12.0 |12.0 12.0 12.0 |
RTOR Vol      |           1   |          28   |          175  |          163  |
_______________________________________________________________________________
Duration     1.00      Area Type: All other areas
______________________________Signal Operations_________________________________
Phase Combination 1     2     3     4 |          5     6     7     8
EB  Left          A     A             | NB  Left A
    Thru                A     A       |     Thru       A
    Right               A     A       |     Right      A
    Peds                              |     Peds
WB  Left          A                   | SB  Left A
    Thru                      A       |     Thru       A
    Right                     A       |     Right      A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            15.0  19.5  65.0              19.0  26.5
Yellow           0.0   0.0   4.0               4.0   4.0
All Red          0.0   0.0   1.0               1.0   1.0
                                                Cycle Length: 160.0    secs
_________________________Intersection Performance Summary_______________________
Appr/   Lane      Adj Sat     Ratios       Lane Group    Approach
Lane    Group     Flow Rate  _____________  ___________   ___________
Grp     Capacity    (s)      v/c    g/C    Delay LOS    Delay LOS
_______________________________________________________________________________
Eastbound
L        391       1814       0.80   0.22   71.8   E
TR       2708      5127       1.00   0.53   73.7   E     73.5    E

Westbound
L        330       3522       0.55   0.09   71.1   E
T        2084      5131       0.80   0.41   44.0   D     45.1    D
R        659       1623       0.42   0.41   34.4   C
Northbound
L        396       3338       0.49   0.12   67.0   E
T        300       1810       0.55   0.17   63.5   E     67.3    E
R        255       1538       0.69   0.17   71.2   E
Southbound
L        396       3338       0.69   0.12   72.7   E
T        300       1810       0.32   0.17   59.4   E     69.9    E
R        255       1538       0.69   0.17   71.2   E
        Intersection Delay = 63.0  (sec/veh)   Intersection LOS = E
_______________________________________________________________________________
```

HCS2000: Unsignalized Intersections Release 4.1d

Wilson Okamoto
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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Forrest St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	600	446	130	204	5	61	6	18	15	43	0
% Thrus Left Lane		80			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	505	595	243	112	64	24	15	45
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	505	595	243	112	64	24	15	45
Left-Turn	0	0	136	0	64	0	15	0
Right-Turn	0	469	0	5	0	18	0	0
Prop. Left-Turns	0.0	0.0	0.6	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.8	0.0	0.0	0.0	0.8	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.5	0.4	0.1	0.6	-0.4	0.6	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	505	595	243	112	64	24	15	45
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.45	0.53	0.22	0.10	0.06	0.02	0.01	0.04
hd, final value	5.60	5.05	6.68	6.36	8.02	7.00	8.09	7.59
x, final value	0.79	0.83	0.45	0.20	0.14	0.05	0.03	0.09
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.3	2.8	4.4	4.1	5.7	4.7	5.8	5.3

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	505	595	243	112	64	24	15	45
Service Time	3.3	2.8	4.4	4.1	5.7	4.7	5.8	5.3
Utilization, x	0.79	0.83	0.45	0.20	0.14	0.05	0.03	0.09
Dep. headway, hd	5.60	5.05	6.68	6.36	8.02	7.00	8.09	7.59
Capacity	640	710	493	362	314	274	265	295
Delay	27.87	31.38	14.82	10.63	12.06	10.04	11.07	11.09
LOS	D	D	B	B	B	B	B	B
Approach:								
Delay	29.76		13.50		11.51		11.08	
LOS	D		B		B		B	

Intersection Delay 24.46 Intersection LOS C

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Forrest St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	244	81	23	841	20	394	38	115	5	8	0
% Thrus Left Lane		75			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	192	149	466	464	414	161	5	8
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	192	149	466	464	414	161	5	8
Left-Turn	0	0	24	0	414	0	5	0
Right-Turn	0	85	0	21	0	121	0	0
Prop. Left-Turns	0.0	0.0	0.1	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.6	0.0	0.0	0.0	0.8	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.3	0.1	0.1	0.6	-0.4	0.6	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	192	149	466	464	414	161	5	8
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.17	0.13	0.41	0.41	0.37	0.14	0.00	0.01
hd, final value	7.99	7.59	7.27	7.21	8.15	7.12	9.40	8.90
x, final value	0.43	0.31	0.94	0.93	0.94	0.32	0.01	0.02
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	5.7	5.3	5.0	4.9	5.8	4.8	7.1	6.6

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	192	149	466	464	414	161	5	8
Service Time	5.7	5.3	5.0	4.9	5.8	4.8	7.1	6.6
Utilization, x	0.43	0.31	0.94	0.93	0.94	0.32	0.01	0.02
Dep. headway, hd	7.99	7.59	7.27	7.21	8.15	7.12	9.40	8.90
Capacity	441	399	495	498	441	411	255	258
Delay	16.60	13.76	79.96	73.41	84.38	13.14	12.22	11.78
LOS	C	B	F	F	F	B	B	B
Approach:								
Delay	15.36		76.69		64.43		11.95	
LOS	C		F		F		B	

Intersection Delay 61.20 Intersection LOS F

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 3/21/2005
Period: AM Peak
Project ID:
E/W St: Ilalo St

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: Forrest St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	2	0	0	2	0	1	1	0	1	1	0
LGConfig		LTR		DefL	TR		L	TR		L	TR	
Volume	0	600	446	130	216	22	61	0	24	15	43	0
Lane Width		12.0		12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vol			45			2			2			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	51.0					29.0			
Yellow	4.0					4.0			
All Red	1.0					1.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	1835	3238	0.57	0.57	13.0	B	13.0	B
Westbound								
DefL	212	374	0.65	0.57	20.2	C		
TR	1013	1787	0.24	0.57	9.9	A	13.6	B
Northbound								
L	424	1317	0.15	0.32	21.9	C		
TR	496	1538	0.05	0.32	21.0	C	21.7	C
Southbound								
L	433	1343	0.04	0.32	21.0	C		
TR	583	1810	0.08	0.32	21.3	C	21.2	C

Intersection Delay = 13.9 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 3/21/2005
Period: PM Peak
Project ID:
E/W St: Ilalo St

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2014 w/ project
N/S St: Forrest St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	2	0	0	2	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	0	244	81	23	1006	64	394	0	153	5	8	0
Lane Width		12.0			12.0		12.0	12.0		12.0	12.0	
RTOR Vol			8			6			15			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A	A		
Thru	A				Thru	A	A		
Right	A				Right	A	A		
Peds					Peds				
WB Left	A				SB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	40.5					14.5	25.0		
Yellow	4.0					0.0	4.0		
All Red	1.0					0.0	1.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	1497	3326	0.22	0.45	15.2	B	15.2	B
Westbound								
LTR	1449	3221	0.79	0.45	24.2	C	24.2	C
Northbound								
L	580	1719	0.72	0.44	24.9	C		
TR	675	1538	0.21	0.44	15.8	B	22.6	C
Southbound								
L	334	1203	0.01	0.28	23.6	C		
TR	503	1810	0.02	0.28	23.6	C	23.6	C

Intersection Delay = 22.3 (sec/veh) Intersection LOS = C

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Keawe St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	289	75	30	529	25	355	30	95	0	40	0
% Thrus Left Lane		60			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	182	200	308	304	373	131	0	42
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	182	200	308	304	373	131	0	42
Left-Turn	0	0	31	0	373	0	0	0
Right-Turn	0	78	0	26	0	100	0	0
Prop. Left-Turns	0.0	0.0	0.1	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.4	0.0	0.1	0.0	0.8	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.2	0.1	0.0	0.6	-0.4	0.1	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	182	200	308	304	373	131	0	42
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.16	0.18	0.27	0.27	0.33	0.12	0.00	0.04
hd, final value	7.41	7.14	7.14	7.03	7.77	6.73	8.30	8.30
x, final value	0.37	0.40	0.61	0.59	0.80	0.24	0.00	0.10
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	5.1	4.8	4.8	4.7	5.5	4.4	6.0	6.0

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	182	200	308	304	373	131	0	42
Service Time	5.1	4.8	4.8	4.7	5.5	4.4	6.0	6.0
Utilization, x	0.37	0.40	0.61	0.59	0.80	0.24	0.00	0.10
Dep. headway, hd	7.41	7.14	7.14	7.03	7.77	6.73	8.30	8.30
Capacity	432	450	497	504	459	381	0	292
Delay	14.54	14.51	20.90	19.89	39.97	11.61	11.00	11.88
LOS	B	B	C	C	E	B	B	B
Approach:								
Delay	14.53		20.40		32.60		11.88	
LOS	B		C		D		B	

Intersection Delay 22.70 Intersection LOS C

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Keawe St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	323	310	90	269	25	70	15	20	0	165	0
% Thrus Left Lane		90			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	305	360	235	168	73	36	0	173
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	305	360	235	168	73	36	0	173
Left-Turn	0	0	94	0	73	0	0	0
Right-Turn	0	326	0	26	0	21	0	0
Prop. Left-Turns	0.0	0.0	0.4	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.9	0.0	0.2	0.0	0.6	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.5	0.3	-0.0	0.6	-0.3	0.1	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	305	360	235	168	73	36	0	173
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.27	0.32	0.21	0.15	0.06	0.03	0.00	0.15
hd, final value	6.18	5.54	6.65	6.34	7.92	7.02	7.27	7.27
x, final value	0.52	0.55	0.43	0.30	0.16	0.07	0.00	0.35
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.9	3.2	4.3	4.0	5.6	4.7	5.0	5.0

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	305	360	235	168	73	36	0	173
Service Time	3.9	3.2	4.3	4.0	5.6	4.7	5.0	5.0
Utilization, x	0.52	0.55	0.43	0.30	0.16	0.07	0.00	0.35
Dep. headway, hd	6.18	5.54	6.65	6.34	7.92	7.02	7.27	7.27
Capacity	555	610	485	418	323	286	0	423
Delay	15.61	15.08	14.42	11.69	12.14	10.25	9.97	13.86
LOS	C	C	B	B	B	B	A	B
Approach:								
Delay	15.32		13.28		11.51		13.86	
LOS	C		B		B		B	

Intersection Delay 14.22 Intersection LOS B

```
            HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                                 Inter.:
Agency:                                     Area Type: All other areas
Date:    4/12/2005                          Jurisd:
Period: AM Peak                             Year  : Year 2014 w/ project
Project ID:
E/W St: Ilalo St                            N/S St: Keawe St

                         SIGNALIZED INTERSECTION SUMMARY
            |  Eastbound      |  Westbound      |  Northbound     |  Southbound     |
            | L    T    R     | L    T    R     | L    T    R     | L    T    R     |
            |                 |                 |                 |                 |
No. Lanes   |   0    2    0   |   0    2    0   |   1    1    0   |   1    1    0   |
LGConfig    |       LTR       | DefL  TR        | L     TR        | L     TR        |
Volume      |0     329  310   |160  268  28     |80   5    20     |0    95    20    |
Lane Width  |      12.0       |12.0 12.0        |12.0 12.0        |12.0 12.0        |
RTOR Vol    |            31   |           3     |           2     |           2     |

Duration      1.00       Area Type: All other areas
                              Signal Operations
Phase Combination 1     2     3     4 |          5     6     7     8
EB  Left          A                   | NB  Left  A
    Thru          A                   |     Thru  A
    Right         A                   |     Right A
    Peds                              |     Peds
WB  Left          A                   | SB  Left  A
    Thru          A                   |     Thru  A
    Right         A                   |     Right A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            44.0                           36.0
Yellow           4.0                            4.0
All Red          1.0                            1.0
                                                 Cycle Length: 90.0     secs
                    Intersection Performance Summary
Appr/   Lane       Adj Sat     Ratios        Lane Group    Approach
Lane    Group      Flow Rate
Grp     Capacity     (s)      v/c     g/C    Delay LOS    Delay LOS

Eastbound

LTR      1568       3208      0.41    0.49   14.9   B     14.9    B

Westbound
DefL     316        647       0.53    0.49   17.6   B
TR       874        1787      0.35    0.49   14.4   B     15.6    B

Northbound
L        492        1231      0.17    0.40   17.6   B
TR       638        1595      0.04    0.40   16.5   B     17.3    B

Southbound
L        537        1342      0.00    0.40   16.2   B
TR       706        1766      0.17    0.40   17.5   B     17.5    B

         Intersection Delay = 15.5  (sec/veh)   Intersection LOS = B
```

```
            HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                                 Inter.:
Agency:                                     Area Type: All other areas
Date:    4/12/2005                          Jurisd:
Period: PM Peak                             Year  : Year 2014 w/ project
Project ID:
E/W St: Ilalo St                            N/S St: Keawe St

                         SIGNALIZED INTERSECTION SUMMARY
            |  Eastbound      |  Westbound      |  Northbound     |  Southbound     |
            | L    T    R     | L    T    R     | L    T    R     | L    T    R     |
            |                 |                 |                 |                 |
No. Lanes   |   0    2    0   |   0    2    0   |   1    1    0   |   1    1    0   |
LGConfig    |       LTR       |       LTR       | L     TR        | L     TR        |
Volume      |0     327  75    |30    634  25    |385  0     115   |0    30    74    |
Lane Width  |      12.0       |      12.0       |12.0 12.0        |12.0 12.0        |
RTOR Vol    |            8    |            3    |           12    |           7     |

Duration      1.00       Area Type: All other areas
                              Signal Operations
Phase Combination 1     2     3     4 |          5     6     7     8
EB  Left          A                   | NB  Left  A
    Thru          A                   |     Thru  A
    Right         A                   |     Right A
    Peds                              |     Peds
WB  Left          A                   | SB  Left  A
    Thru          A                   |     Thru  A
    Right         A                   |     Right A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green            37.0                           43.0
Yellow           4.0                            4.0
All Red          1.0                            1.0
                                                 Cycle Length: 90.0     secs
                    Intersection Performance Summary
Appr/   Lane       Adj Sat     Ratios        Lane Group    Approach
Lane    Group      Flow Rate
Grp     Capacity     (s)      v/c     g/C    Delay LOS    Delay LOS

Eastbound

LTR      1380       3357      0.30    0.41   17.9   B     17.9    B

Westbound

LTR      1297       3154      0.56    0.41   20.8   C     20.8    C

Northbound
L        597        1249      0.68    0.48   21.3   C
TR       735        1538      0.15    0.48   13.3   B     19.6    B

Southbound
L        594        1244      0.00    0.48   12.3   B
TR       775        1622      0.13    0.48   13.2   B     13.2    B

         Intersection Delay = 19.3  (sec/veh)   Intersection LOS = B
```

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Coral St
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	106	237			352	0
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	111	249			370	0
Percent Heavy Vehicles	5	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	2			2	0
Configuration	LT	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				0		32
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				0		33
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	111					0		33
C(m) (vph)	1164					324		816
v/c	0.10					0.00		0.04
95% queue length	0.32					0.00		0.13
Control Delay	8.4					16.1		9.6
LOS	A					C		A
Approach Delay							9.6	
Approach LOS							A	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Coral St
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	18	366			459	0
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	18	385			483	0
Percent Heavy Vehicles	5	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	2			2	0
Configuration	LT	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				0		125
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				0		131
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	18					0		131
C(m) (vph)	1055					355		750
v/c	0.02					0.00		0.17
95% queue length	0.05					0.00		0.63
Control Delay	8.5					15.1		10.8
LOS	A					C		B
Approach Delay							10.8	
Approach LOS							B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Coral St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	101	248			423	181
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	106	261			445	190
Percent Heavy Vehicles	5	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	2			2	0
Configuration	LT	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume				11		33
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				11		34
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	106					11		34
C(m) (vph)	924					248		669
v/c	0.11					0.04		0.05
95% queue length	0.39					0.14		0.16
Control Delay	9.4					20.2		10.7
LOS	A					C		B
Approach Delay							13.0	
Approach LOS							B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Coral St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	18	424			414	52
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	18	446			435	54
Percent Heavy Vehicles	5	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	2			2	0
Configuration	LT	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume				65		275
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				68		289
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	18					68		289
C(m) (vph)	1050					350		747
v/c	0.02					0.19		0.39
95% queue length	0.05					0.72		1.88
Control Delay	8.5					17.8		12.9
LOS	A					C		B
Approach Delay							13.8	
Approach LOS							B	

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Cooke St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	138	99	5	5	294	0	5	20	5	0	20	48
% Thrus Left Lane		0			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	145	109	159	154	5	26	0	71
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	145	109	159	154	5	26	0	71
Left-Turn	145	0	5	0	5	0	0	0
Right-Turn	0	5	0	0	0	5	0	50
Prop. Left-Turns	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.7
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.6	0.1	0.1	0.1	0.6	-0.0	0.1	-0.4

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	145	109	159	154	5	26	0	71
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.13	0.10	0.14	0.14	0.00	0.02	0.00	0.06
hd, final value	5.66	5.13	5.13	5.11	6.50	5.87	5.95	5.46
x, final value	0.23	0.16	0.23	0.22	0.01	0.04	0.00	0.11
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.4	2.8	2.8	2.8	4.2	3.6	3.6	3.2

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	145	109	159	154	5	26	0	71
Service Time	3.4	2.8	2.8	2.8	4.2	3.6	3.6	3.2
Utilization, x	0.23	0.16	0.23	0.22	0.01	0.04	0.00	0.11
Dep. headway, hd	5.66	5.13	5.13	5.11	6.50	5.87	5.95	5.46
Capacity	395	359	409	404	255	276	0	321
Delay	10.02	8.77	9.33	9.24	9.26	8.83	8.65	8.81
LOS	B	A	A	A	A	A	A	A
Approach:								
Delay	9.48		9.29		8.90		8.81	
LOS	A		A		A		A	

Intersection Delay 9.29 Intersection LOS A

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Cooke St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
Volume	34	332	0	0	304	0	5	30	5	0	10	155
% Thrus Left Lane		50			50							

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	209	174	160	160	5	36	0	173
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	209	174	160	160	5	36	0	173
Left-Turn	35	0	0	0	5	0	0	0
Right-Turn	0	0	0	0	0	5	0	163
Prop. Left-Turns	0.2	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.9
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.2	0.1	0.1	0.1	0.6	-0.0	0.1	-0.6

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	209	174	160	160	5	36	0	173
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.19	0.15	0.14	0.14	0.00	0.03	0.00	0.15
hd, final value	5.65	5.57	5.64	5.64	7.03	6.43	6.32	5.66
x, final value	0.33	0.27	0.25	0.25	0.01	0.06	0.00	0.27
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.4	3.3	3.3	3.3	4.7	4.1	4.0	3.4

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	209	174	160	160	5	36	0	173
Service Time	3.4	3.3	3.3	3.3	4.7	4.1	4.0	3.4
Utilization, x	0.33	0.27	0.25	0.25	0.01	0.06	0.00	0.27
Dep. headway, hd	5.65	5.57	5.64	5.64	7.03	6.43	6.32	5.66
Capacity	459	424	410	410	255	286	0	423
Delay	11.11	10.32	10.23	10.23	9.80	9.57	9.02	10.48
LOS	B	B	B	B	A	A	A	B
Approach:								
Delay	10.75		10.23		9.60		10.48	
LOS	B		B		A		B	

Intersection Delay 10.46 Intersection LOS B

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Cooke St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	160	99	5	5	469	30	5	20	5	6	20	125
% Thrus Left Lane	0			50								

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	168	109	251	278	5	26	6	152
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	168	109	251	278	5	26	6	152
Left-Turn	168	0	5	0	5	0	6	0
Right-Turn	0	5	0	31	0	5	0	131
Prop. Left-Turns	1.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.9
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.6	0.1	0.1	0.0	0.6	-0.0	0.6	-0.5

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	168	109	251	278	5	26	6	152
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.15	0.10	0.22	0.25	0.00	0.02	0.01	0.14
hd, final value	6.24	5.71	5.49	5.41	7.22	6.59	7.01	5.90
x, final value	0.29	0.17	0.38	0.42	0.01	0.05	0.01	0.25
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.9	3.4	3.2	3.1	4.9	4.3	4.7	3.6

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	168	109	251	278	5	26	6	152
Service Time	3.9	3.4	3.2	3.1	4.9	4.3	4.7	3.6
Utilization, x	0.29	0.17	0.38	0.42	0.01	0.05	0.01	0.25
Dep. headway, hd	6.24	5.71	5.49	5.41	7.22	6.59	7.01	5.90
Capacity	418	359	501	528	255	276	256	402
Delay	11.49	9.60	11.59	11.97	10.00	9.62	9.79	10.56
LOS	B	A	B	B	A	A	A	B
Approach:								
Delay	10.75		11.79		9.68		10.53	
LOS	B		B		A		B	

Intersection Delay 11.23 Intersection LOS B

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Cooke St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	157	332	0	0	332	21	5	30	5	9	10	134
% Thrus Left Lane		20			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	234	280	174	196	5	36	9	151
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	234	280	174	196	5	36	9	151
Left-Turn	165	0	0	0	5	0	9	0
Right-Turn	0	0	0	22	0	5	0	141
Prop. Left-Turns	0.7	0.0	0.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.9
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.4	0.1	0.1	0.0	0.6	-0.0	0.6	-0.6

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	234	280	174	196	5	36	9	151
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.21	0.25	0.15	0.17	0.00	0.03	0.01	0.13
hd, final value	5.99	5.64	5.82	5.74	7.42	6.82	7.20	6.05
x, final value	0.39	0.44	0.28	0.31	0.01	0.07	0.02	0.25
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.7	3.3	3.5	3.4	5.1	4.5	4.9	3.7

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	234	280	174	196	5	36	9	151
Service Time	3.7	3.3	3.5	3.4	5.1	4.5	4.9	3.7
Utilization, x	0.39	0.44	0.28	0.31	0.01	0.07	0.02	0.25
Dep. headway, hd	5.99	5.64	5.82	5.74	7.42	6.82	7.20	6.05
Capacity	484	530	424	446	255	286	259	401
Delay	12.50	12.72	10.79	11.04	10.20	10.02	10.03	10.80
LOS	B	B	B	B	B	B	B	B
Approach:								
Delay	12.62		10.92		10.04		10.76	
LOS	B		B		B		B	

Intersection Delay 11.67 Intersection LOS B

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TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Koula St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	4	95			271	0
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	4	100			285	0
Percent Heavy Vehicles	5	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	2			2	0
Configuration	LT	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume				0		23
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				0		24
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	4					0		24
C(m) (vph)	1253					617		870
v/c	0.00					0.00		0.03
95% queue length	0.01					0.00		0.09
Control Delay	7.9					10.8		9.3
LOS	A					B		A
Approach Delay							9.3	
Approach LOS							A	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out improvements
East/West Street: Ilalo St
North/South Street: Koula St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	18	314			293	0
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	18	330			308	0
Percent Heavy Vehicles	5	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	2			2	0
Configuration	LT	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume				0		11
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				0		11
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	18					0		11
C(m) (vph)	1228					479		855
v/c	0.01					0.00		0.01
95% queue length	0.04					0.00		0.04
Control Delay	8.0					12.5		9.3
LOS	A					B		A
Approach Delay							9.3	
Approach LOS							A	

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                 HCS2000: Unsignalized Intersections Release 4.1d

_______________________TWO-WAY STOP CONTROL SUMMARY_____________________________

Analyst:               CL
Agency/Co.:
Date Performed:        3/21/2005
Analysis Time Period:  AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year:         Year 2014 w/ project
Project ID:
East/West Street:      Ilalo St
North/South Street:    Koula St
Intersection Orientation: EW                  Study period (hrs):  1.00

______________________Vehicle Volumes and Adjustments_________________________
Major Street:  Approach        Eastbound                Westbound
               Movement     1       2       3    |  4       5       6
                            L       T       R    |  L       T       R
_______________________________________________________________________________
Volume                      10      95                      445     3
Peak-Hour Factor, PHF       0.95    0.95                    0.95    0.95
Hourly Flow Rate, HFR       10      100                     468     3
Percent Heavy Vehicles      5       --      --              --      --
Median Type/Storage         Undivided              /
RT Channelized?
Lanes                           0   2                       2     0
Configuration                    LT T                       T    TR
Upstream Signal?                    No                      No

Minor Street:  Approach        Northbound               Southbound
               Movement     7       8       9    |  10      11      12
                            L       T       R    |  L       T       R
_______________________________________________________________________________
Volume                                              0               54
Peak Hour Factor, PHF                               0.95            0.95
Hourly Flow Rate, HFR                               0               56
Percent Heavy Vehicles                              5               5
Percent Grade (%)                   0                       0
Flared Approach:  Exists?/Storage               /                       /
Lanes                                                   1       1
Configuration                                            L      R
_______________________________________________________________________________

_________________Delay, Queue Length, and Level of Service_____________________
Approach          EB     WB            Northbound              Southbound
Movement          1      4    |  7       8       9     |  10       11      12
Lane Config       LT          |                        |  L                R
_______________________________________________________________________________
v (vph)           10                                      0                56
C(m) (vph)        1066                                    461              756
v/c               0.01                                    0.00             0.07
95% queue length  0.03                                    0.00             0.24
Control Delay     8.4                                     12.8             10.1
LOS                A                                       B                B
Approach Delay                                                     10.1
Approach LOS                                                        B
_______________________________________________________________________________
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                 HCS2000: Unsignalized Intersections Release 4.1d

_______________________TWO-WAY STOP CONTROL SUMMARY_____________________________

Analyst:               CL
Agency/Co.:
Date Performed:        3/21/2005
Analysis Time Period:  PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year:         Year 2014 w/ project
Project ID:
East/West Street:      Ilalo St
North/South Street:    Koula St
Intersection Orientation: EW                  Study period (hrs):  1.00

______________________Vehicle Volumes and Adjustments_________________________
Major Street:  Approach        Eastbound                Westbound
               Movement     1       2       3    |  4       5       6
                            L       T       R    |  L       T       R
_______________________________________________________________________________
Volume                      27      314                     321     13
Peak-Hour Factor, PHF       0.95    0.95                    0.95    0.95
Hourly Flow Rate, HFR       28      330                     337     13
Percent Heavy Vehicles      5       --      --              --      --
Median Type/Storage         Undivided              /
RT Channelized?
Lanes                           0   2                       2     0
Configuration                    LT T                       T    TR
Upstream Signal?                    No                      No

Minor Street:  Approach        Northbound               Southbound
               Movement     7       8       9    |  10      11      12
                            L       T       R    |  L       T       R
_______________________________________________________________________________
Volume                                              0               32
Peak Hour Factor, PHF                               0.95            0.95
Hourly Flow Rate, HFR                               0               33
Percent Heavy Vehicles                              5               5
Percent Grade (%)                   0                       0
Flared Approach:  Exists?/Storage               /                       /
Lanes                                                   1       1
Configuration                                            L      R
_______________________________________________________________________________

_________________Delay, Queue Length, and Level of Service_____________________
Approach          EB     WB            Northbound              Southbound
Movement          1      4    |  7       8       9     |  10       11      12
Lane Config       LT          |                        |  L                R
_______________________________________________________________________________
v (vph)           28                                      0                33
C(m) (vph)        1184                                    437              829
v/c               0.02                                    0.00             0.04
95% queue length  0.07                                    0.00             0.12
Control Delay     8.1                                     13.2             9.5
LOS                A                                       B                A
Approach Delay                                                     9.5
Approach LOS                                                        A
_______________________________________________________________________________
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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Ahui St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	82	7	7	228	0	43	0	75	0	11	0
% Thrus Left Lane		50			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	43	50	127	120	45	78	0	11
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	43	50	127	120	45	78	0	11
Left-Turn	0	0	7	0	45	0	0	0
Right-Turn	0	7	0	0	0	78	0	0
Prop. Left-Turns	0.0	0.0	0.1	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.1	0.0	0.0	0.0	1.0	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.0	0.1	0.1	0.6	-0.6	0.1	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	43	50	127	120	45	78	0	11
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.04	0.04	0.11	0.11	0.04	0.07	0.00	0.01
hd, final value	5.15	5.05	5.04	5.01	5.91	4.71	5.53	5.53
x, final value	0.06	0.07	0.18	0.17	0.07	0.10	0.00	0.02
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	2.8	2.8	2.7	2.7	3.6	2.4	3.2	3.2

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	43	50	127	120	45	78	0	11
Service Time	2.8	2.8	2.7	2.7	3.6	2.4	3.2	3.2
Utilization, x	0.06	0.07	0.18	0.17	0.07	0.10	0.00	0.02
Dep. headway, hd	5.15	5.05	5.04	5.01	5.91	4.71	5.53	5.53
Capacity	293	300	377	370	295	328	0	261
Delay	8.19	8.13	8.83	8.71	9.08	7.94	8.23	8.32
LOS	A	A	A	A	A	A	A	A
Approach:								
Delay	8.16		8.77		8.36		8.32	
LOS	A		A		A		A	

Intersection Delay 8.53 Intersection LOS A

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID: w/out modifications
East/West Street: Ilalo St
North/South Street: Ahui St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	251	63	61	88	0	205	0	363	0	94	0
% Thrus Left Lane		60			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	157	172	110	46	215	382	0	98
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	157	172	110	46	215	382	0	98
Left-Turn	0	0	64	0	215	0	0	0
Right-Turn	0	66	0	0	0	382	0	0
Prop. Left-Turns	0.0	0.0	0.6	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.4	0.0	0.0	0.0	1.0	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.2	0.4	0.1	0.6	-0.6	0.1	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	157	172	110	46	215	382	0	98
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.14	0.15	0.10	0.04	0.19	0.34	0.00	0.09
hd, final value	6.65	6.38	7.19	6.90	6.68	5.48	6.85	6.85
x, final value	0.29	0.30	0.22	0.09	0.40	0.58	0.00	0.19
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	4.3	4.1	4.9	4.6	4.4	3.2	4.6	4.6

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	157	172	110	46	215	382	0	98
Service Time	4.3	4.1	4.9	4.6	4.4	3.2	4.6	4.6
Utilization, x	0.29	0.30	0.22	0.09	0.40	0.58	0.00	0.19
Dep. headway, hd	6.65	6.38	7.19	6.90	6.68	5.48	6.85	6.85
Capacity	407	422	360	296	465	632	0	348
Delay	12.06	11.87	11.91	10.26	13.80	15.73	9.55	11.12
LOS	B	B	B	B	B	C	A	B
Approach:								
Delay	11.96		11.42		15.04		11.12	
LOS	B		B		C		B	

Intersection Delay 13.38 Intersection LOS B

HCS2000: Unsignalized Intersections Release 4.1d

Wilson Okamoto
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Phone: Fax:
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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Ahui St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	88	7	7	405	0	43	0	75	0	11	0
% Thrus Left Lane		50			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	46	53	219	213	45	78	0	11
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	46	53	219	213	45	78	0	11
Left-Turn	0	0	7	0	45	0	0	0
Right-Turn	0	7	0	0	0	78	0	0
Prop. Left-Turns	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.1	0.0	0.0	0.0	1.0	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.0	0.1	0.1	0.6	-0.6	0.1	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	46	53	219	213	45	78	0	11
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.04	0.05	0.19	0.19	0.04	0.07	0.00	0.01
hd, final value	5.36	5.27	5.06	5.05	6.32	5.12	5.97	5.97
x, final value	0.07	0.08	0.31	0.30	0.08	0.11	0.00	0.02
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.1	3.0	2.8	2.7	4.0	2.8	3.7	3.7

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	46	53	219	213	45	78	0	11
Service Time	3.1	3.0	2.8	2.7	4.0	2.8	3.7	3.7
Utilization, x	0.07	0.08	0.31	0.30	0.08	0.11	0.00	0.02
Dep. headway, hd	5.36	5.27	5.06	5.05	6.32	5.12	5.97	5.97
Capacity	296	303	469	463	295	328	0	261
Delay	8.46	8.41	10.01	9.89	9.57	8.46	8.67	8.78
LOS	A	A	B	A	A	A	A	A
Approach:								
Delay	8.43		9.95		8.87		8.78	
LOS	A		A		A		A	

Intersection Delay 9.51 Intersection LOS A

HCS2000: Unsignalized Intersections Release 4.1d

Wilson Okamoto
Wilson Okamoto

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2014 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Ahui St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
Volume	0	251	63	61	129	0	205	0	363	0	94	0
% Thrus Left Lane		60			50							

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	157	172	131	68	215	382	0	98
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	157	172	131	68	215	382	0	98
Left-Turn	0	0	64	0	215	0	0	0
Right-Turn	0	66	0	0	0	382	0	0
Prop. Left-Turns	0.0	0.0	0.5	0.0	1.0	0.0	0.0	0.0
Prop. Right-Turns	0.0	0.4	0.0	0.0	0.0	1.0	0.0	0.0
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1	-0.2	0.3	0.1	0.6	-0.6	0.1	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	157	172	131	68	215	382	0	98
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.14	0.15	0.12	0.06	0.19	0.34	0.00	0.09
hd, final value	6.76	6.49	7.18	6.94	6.81	5.61	7.01	7.01
x, final value	0.29	0.31	0.26	0.13	0.41	0.60	0.00	0.19
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	4.5	4.2	4.9	4.6	4.5	3.3	4.7	4.7

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	157	172	131	68	215	382	0	98
Service Time	4.5	4.2	4.9	4.6	4.5	3.3	4.7	4.7
Utilization, x	0.29	0.31	0.26	0.13	0.41	0.60	0.00	0.19
Dep. headway, hd	6.76	6.49	7.18	6.94	6.81	5.61	7.01	7.01
Capacity	407	422	381	318	465	627	0	348
Delay	12.28	12.10	12.42	10.69	14.17	16.50	9.71	11.37
LOS	B	B	B	B	B	C	A	B
Approach:								
Delay	12.18		11.83		15.66		11.37	
LOS	B		B		C		B	

Intersection Delay 13.76 Intersection LOS B

APPENDIX F

CAPACITY ANALYSIS CALCULATIONS
YEAR 2025 PEAK HOUR TRAFFIC ANALYSIS
WITH PROJECT

```
              HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                               Inter.:
Agency:                                   Area Type: All other areas
Date:    02/01/05                         Jurisd:
Period: AM Peak                           Year  : Year 2025 w/ project
Project ID:
E/W St: Ala Moana Boulevard               N/S St: Punchbowl Street

___________________________SIGNALIZED INTERSECTION SUMMARY_______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound    |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R    |
           |               |               |               |                |
No. Lanes  |  0    3    1  |  0    3    0  |   3    0    0 |   2    0    2   |
LGConfig   |       T    R  |       T       | L             | L         R    |
Volume     |     2893 1208 |     2323      |381            |325        172   |
Lane Width |     12.0 12.0 |     12.0      |12.0           |12.0       12.0  |
RTOR Vol   |          1208 |               |               |           17    |
________________________________________________________________________________
Duration     1.00      Area Type: All other areas
________________________________Signal Operations_______________________________
Phase Combination 1     2     3     4 |            5     6     7     8
EB  Left                              | NB  Left   A
    Thru         A                    |     Thru
    Right        A                    |     Right
    Peds                              |     Peds
WB  Left                              | SB  Left   A
    Thru         A                    |     Thru
    Right                             |     Right  A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green           90.0                              40.0
Yellow          4.0                               4.0
All Red         1.0                               1.0
                                                   Cycle Length: 140.0   secs
______________________Intersection Performance Summary__________________________
Appr/   Lane        Adj Sat    Ratios          Lane Group   Approach
Lane    Group       Flow Rate  ________        __________  ___________
Grp     Capacity     (s)       v/c     g/C     Delay LOS   Delay LOS
________________________________________________________________________________
Eastbound

T         3298       5131      0.97    0.64    39.0   D    39.0   D
R         1043       1623      0.00    0.64    8.9    A
Westbound

T         3298       5131      0.71    0.64    17.2   B    17.2   B

Northbound
L         1338       4683      0.32    0.29    39.4   D
                                                           39.4   D

Southbound
L         954        3338      0.37    0.29    40.2   D
                                                           39.6   D
R         778        2722      0.22    0.29    38.2   D
        Intersection Delay = 31.2  (sec/veh)   Intersection LOS = C
________________________________________________________________________________
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              HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                               Inter.:
Agency:                                   Area Type: All other areas
Date:    02/01/05                         Jurisd:
Period: PM Peak                           Year  : Year 2025 w/ project
Project ID:
E/W St: Ala Moana Boulevard               N/S St: Punchbowl Street

___________________________SIGNALIZED INTERSECTION SUMMARY_______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound    |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R    |
           |               |               |               |                |
No. Lanes  |  0    3    1  |  0    3    0  |   3    0    0 |   2    0    2   |
LGConfig   |       T    R  |       T       | L             | L         R    |
Volume     |     2606 392  |     2801      |1844           |293        333   |
Lane Width |     12.0 12.0 |     12.0      |12.0           |12.0       12.0  |
RTOR Vol   |          392  |               |               |           33    |
________________________________________________________________________________
Duration     1.00      Area Type: All other areas
________________________________Signal Operations_______________________________
Phase Combination 1     2     3     4 |            5     6     7     8
EB  Left                              | NB  Left   A
    Thru         A                    |     Thru
    Right        A                    |     Right
    Peds                              |     Peds
WB  Left                              | SB  Left   A
    Thru         A                    |     Thru
    Right                             |     Right  A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green           77.0                              53.0
Yellow          4.0                               4.0
All Red         1.0                               1.0
                                                   Cycle Length: 140.0   secs
______________________Intersection Performance Summary__________________________
Appr/   Lane        Adj Sat    Ratios          Lane Group   Approach
Lane    Group       Flow Rate  ________        __________  ___________
Grp     Capacity     (s)       v/c     g/C     Delay LOS   Delay LOS
________________________________________________________________________________
Eastbound

T         2822       5131      1.00    0.55    69.1   E    69.1   E
R         893        1623      0.00    0.55    14.2   B
Westbound

T         2822       5131      0.99    0.55    58.7   E    58.7   E

Northbound
L         1866       4929      0.99    0.38    75.0   E
                                                           75.0   E

Southbound
L         1330       3514      0.25    0.38    30.0   C
                                                           30.4   C
R         1085       2866      0.31    0.38    30.9   C
        Intersection Delay = 63.7  (sec/veh)   Intersection LOS = E
________________________________________________________________________________
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               HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                               Inter.:
Agency:                                   Area Type: All other areas
Date:    2/1/05                           Jurisd:
Period: AM Peak                           Year  : Year 2025 w/ project
Project ID: w/out modifications
E/W St: Ala Moana Boulevard               N/S St: South Street/Forrest Ave

______________________SIGNALIZED INTERSECTION SUMMARY______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
           |_______________|_______________|_______________|_______________|
No. Lanes  |  0    3    0  |  0    3    0  |  0    1    0  |  0    1    1  |
LGConfig   |       TR      |       TR      |      LTR      |      LT    R  |
Volume     |     2967 246  |     2129 150  |87    56   11  |11   106  41   |
Lane Width |     12.0      |     12.0      |     12.0      |     12.0 12.0 |
RTOR Vol   |           25  |           15  |            1  |            0  |
___________________________________________________________________________
Duration     1.00       Area Type: All other areas
______________________________Signal Operations____________________________
Phase Combination 1      2      3      4 |           5     6     7     8
EB  Left                                 | NB  Left  A
    Thru          A                      |     Thru  A
    Right         A                      |     Right A
    Peds                                 |     Peds
WB  Left                                 | SB  Left  A
    Thru          A                      |     Thru  A
    Right         A                      |     Right A
    Peds                                 |     Peds
NB  Right                                | EB  Right
SB  Right                                | WB  Right
Green            92.0                              38.0
Yellow           4.0                               4.0
All Red          1.0                               1.0
                                                  Cycle Length: 140.0   secs
_________________Intersection Performance Summary_________________________
Appr/  Lane      Adj Sat     Ratios       Lane Group    Approach
Lane   Group     Flow Rate  ___________  ___________  ___________
Grp    Capacity   (s)       v/c    g/C   Delay LOS    Delay LOS
___________________________________________________________________________
Eastbound

TR       3337     5078      1.00   0.66   50.7   D     50.7   D

Westbound

TR       3342     5085      0.73   0.66   16.6   B     16.6   B

Northbound

LTR      292      1076      0.67   0.27   51.7   D     51.7   D

Southbound

LT       474      1747      0.29   0.27   40.6   D     40.1   D
R        417      1538      0.12   0.27   38.5   D
         Intersection Delay = 36.9  (sec/veh)   Intersection LOS = D
___________________________________________________________________________
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```
               HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                               Inter.:
Agency:                                   Area Type: All other areas
Date:    2/1/05                           Jurisd:
Period: PM Peak                           Year  : Year 2025 w/ project
Project ID: w/out modifications
E/W St: Ala Moana Boulevard               N/S St: South Street/Forrest Ave

______________________SIGNALIZED INTERSECTION SUMMARY______________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
           |_______________|_______________|_______________|_______________|
No. Lanes  |  0    3    0  |  0    3    0  |  0    1    0  |  0    1    1  |
LGConfig   |       TR      |       TR      |      LTR      |      LT    R  |
Volume     |     3321 26   |     2424 97   |348  153  73   |50   18   281  |
Lane Width |     12.0      |     12.0      |     12.0      |     12.0 12.0 |
RTOR Vol   |           3   |           10  |            7  |            0  |
___________________________________________________________________________
Duration     1.00       Area Type: All other areas
______________________________Signal Operations____________________________
Phase Combination 1      2      3      4 |           5     6     7     8
EB  Left                                 | NB  Left  A     A
    Thru          A                      |     Thru  A     A
    Right         A                      |     Right A     A
    Peds                                 |     Peds
WB  Left                                 | SB  Left        A
    Thru          A                      |     Thru        A
    Right         A                      |     Right       A
    Peds                                 |     Peds
NB  Right                                | EB  Right
SB  Right                                | WB  Right
Green            75.0                              30.0  25.0
Yellow           4.0                               0.0   4.0
All Red          1.0                               0.0   1.0
                                                  Cycle Length: 140.0   secs
_________________Intersection Performance Summary_________________________
Appr/  Lane      Adj Sat     Ratios       Lane Group    Approach
Lane   Group     Flow Rate  ___________  ___________  ___________
Grp    Capacity   (s)       v/c    g/C   Delay LOS    Delay LOS
___________________________________________________________________________
Eastbound

TR       2746     5126      1.35   0.54   670.8  F     670.8  F

Westbound

TR       2734     5104      0.95   0.54   40.4   D     40.4   D

Northbound

LTR      517      1728      1.34   0.39   661.8  F     661.8  F

Southbound

LT       145      814       0.58   0.18   58.5   E     461.0  F
R        275      1538      1.26   0.18   558.4  F
         Intersection Delay = 438.1 (sec/veh)   Intersection LOS = F
___________________________________________________________________________
```

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: AM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2025 w/ project
N/S St: South Street/Forrest Ave

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	3	0	0	3	0	0	1	0	0	1	1
LGConfig		TR			TR			TR			T	R
Volume		2967	246		2129	150		56	11		106	41
Lane Width		12.0			12.0			12.0			12.0	12.0
RTOR Vol			25			15			1			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left				
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left					SB Left				
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	93.5					36.5			
Yellow	4.0					4.0			
All Red	1.0					1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
TR	3391	5078	0.98	0.67	39.1	D	39.1	D
Westbound								
TR	3396	5085	0.72	0.67	15.6	B	15.6	B
Northbound								
TR	462	1772	0.18	0.26	40.4	D	40.4	D
Southbound								
T	472	1810	0.26	0.26	41.3	D	40.9	D
R	401	1538	0.12	0.26	39.6	D		

Intersection Delay = 29.6 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: PM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2025 w/ project
N/S St: South Street/Forrest Ave

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	3	0	0	3	0	0	1	0	0	1	1
LGConfig		TR			TR			TR			T	R
Volume		3321	26		2424	97		153	73		18	281
Lane Width		12.0			12.0			12.0			12.0	12.0
RTOR Vol			3			10			7			0

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left				
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left					SB Left				
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	95.5					34.5			
Yellow	4.0					4.0			
All Red	1.0					1.0			

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
TR	3497	5126	1.01	0.68	59.3	E	59.3	E
Westbound								
TR	3482	5104	0.74	0.68	15.2	B	15.2	B
Northbound								
TR	428	1736	0.57	0.25	48.0	D	48.0	D
Southbound								
T	446	1810	0.04	0.25	40.2	D	63.6	E
R	379	1538	0.82	0.25	65.2	E		

Intersection Delay = 42.0 (sec/veh) Intersection LOS = D

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Keawe St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		1794	153		1554	51
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		1888	161		1635	53
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume			23			59
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			24			62
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					24			62
C(m) (vph)					311			395
v/c					0.08			0.16
95% queue length					0.25			0.56
Control Delay					17.5			15.8
LOS					C			C
Approach Delay				17.5			15.8	
Approach LOS				C			C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Keawe St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		1989	60		1622	84
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		2093	63		1707	88
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume			107			166
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			112			174
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					112			174
C(m) (vph)					299			368
v/c					0.37			0.47
95% queue length					1.76			2.62
Control Delay					24.2			23.5
LOS					C			C
Approach Delay				24.2			23.5	
Approach LOS				C			C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Coral St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		1647	255		1591	33
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		1733	268		1674	34
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume			16			24
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			16			25
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					16			25
C(m) (vph)					321			390
v/c					0.05			0.06
95% queue length					0.16			0.21
Control Delay					16.8			14.9
LOS					C			B
Approach Delay				16.8			14.9	
Approach LOS				C			B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Coral St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		2067	59		1689	23
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		2175	62		1777	24
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume			109			54
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			114			56
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					114			56
C(m) (vph)					302			367
v/c					0.38			0.15
95% queue length					1.79			0.54
Control Delay					24.1			16.6
LOS					C			C
Approach Delay				24.1			16.6	
Approach LOS				C			C	

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 3/14/2005
Period: AM Peak
Project ID:
E/W St: Ala Moana Blvd

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2025 w/ project
N/S St: Cooke St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	1	1	1	1	1	0
LGConfig	L	TR		L	TR		L	T	R	L	TR	
Volume	187	2093	206	175	2295	76	69	73	24	71	153	56
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			21			8			12			6

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
WB Left	A				SB Left	A			
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	20.0	68.0				10.0	22.0		
Yellow	4.0	4.0				4.0	4.0		
All Red	1.0	1.0				1.0	1.0		

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	259	1814	0.76	0.14	71.1	E		
TR	2462	5068	0.97	0.49	53.9	D	55.2	E
Westbound								
L	259	1814	0.71	0.14	66.4	E		
TR	2482	5109	1.00	0.49	74.4	E	73.9	E
Northbound								
L	123	1719	0.59	0.07	70.8	E		
T	284	1810	0.27	0.16	52.5	D	60.5	E
R	242	1538	0.05	0.16	50.2	D		
Southbound								
L	123	1719	0.61	0.07	71.9	E		
TR	274	1742	0.78	0.16	71.6	E	71.7	E

Intersection Delay = 64.9 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 3/14/2005
Period: PM Peak
Project ID:
E/W St: Ala Moana Blvd

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2025 w/ project
N/S St: Cooke St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	1	3	0	1	1	1	1	1	0
LGConfig	L	TR		L	TR		L	T	R	L	TR	
Volume	170	2467	50	38	2209	85	221	218	92	99	83	125
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	
RTOR Vol			5			9			46			13

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A	A			NB Left	A	A		
Thru		A	A		Thru		A	A	
Right		A	A		Right		A	A	
Peds					Peds				
WB Left	A				SB Left	A			
Thru			A		Thru			A	
Right			A		Right			A	
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	6.5	12.0	66.0			12.5	11.0	22.0	
Yellow	0.0	0.0	4.0			0.0	0.0	4.0	
All Red	0.0	0.0	1.0			0.0	0.0	1.0	

Cycle Length: 140.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	240	1814	0.75	0.13	71.4	E		
TR	2851	5117	0.93	0.56	35.2	D	37.5	D
Westbound								
L	84	1814	0.48	0.05	69.4	E		
TR	2407	5105	1.00	0.47	72.9	E	72.8	E
Northbound								
L	289	1719	0.81	0.17	73.3	E		
T	427	1810	0.54	0.24	48.2	D	59.1	E
R	363	1538	0.13	0.24	42.4	D		
Southbound								
L	153	1719	0.68	0.09	74.0	E		
TR	260	1653	0.79	0.16	73.3	E	73.6	E

Intersection Delay = 55.3 (sec/veh) Intersection LOS = E

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 2/1/05
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/out project
Project ID:
East/West Street: Ala Moana Boulevard
North/South Street: Ohe Street
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		1505	24		1652	0
Peak-Hour Factor, PHF		0.94	0.94		0.95	0.95
Hourly Flow Rate, HFR		1601	25		1738	0
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume			2			4
Peak Hour Factor, PHF			0.50			0.33
Hourly Flow Rate, HFR			4			12
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					4			12
C(m) (vph)					315			289
v/c					0.01			0.04
95% queue length					0.04			0.13
Control Delay					16.6			18.0
LOS					C			C
Approach Delay				16.6			18.0	
Approach LOS				C			C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 2/1/05
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/out project
Project ID:
East/West Street: Ala Moana Boulevard
North/South Street: Ohe Street
Intersection Orientation: EW   Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		2000	28		1670	0
Peak-Hour Factor, PHF		0.97	0.97		0.94	0.94
Hourly Flow Rate, HFR		2061	28		1776	0
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume			33			2
Peak Hour Factor, PHF			0.83			0.25
Hourly Flow Rate, HFR			39			8
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					39			8
C(m) (vph)					221			281
v/c					0.18			0.03
95% queue length					0.64			0.09
Control Delay					24.8			18.2
LOS					C			C
Approach Delay				24.8			18.2	
Approach LOS				C			C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Koula St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1401	5		1635	15
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		1474	5		1721	15
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			17			15
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			17			15
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					17			15
C(m) (vph)					453			383
v/c					0.04			0.04
95% queue length					0.12			0.12
Control Delay					13.3			14.8
LOS					B			B
Approach Delay				13.3			14.8	
Approach LOS				B			B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ala Moana Blvd
North/South Street: Koula St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		1996	27		1664	56
Peak-Hour Factor, PHF		0.95	0.95		0.95	0.95
Hourly Flow Rate, HFR		2101	28		1751	58
Percent Heavy Vehicles		--	--		--	--
Median Type/Storage	Raised curb			/ 1		
RT Channelized?						
Lanes		2	0		2	0
Configuration		T	TR		T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume			3			21
Peak Hour Factor, PHF			0.95			0.95
Hourly Flow Rate, HFR			3			22
Percent Heavy Vehicles			5			5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes			1			1
Configuration			R			R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config					R			R
v (vph)					3			22
C(m) (vph)					295			365
v/c					0.01			0.06
95% queue length					0.03			0.19
Control Delay					17.3			15.5
LOS					C			C
Approach Delay				17.3			15.5	
Approach LOS				C			C	

HCS2000: Signalized Intersections Release 4.1e

Analyst:
Agency:
Date: 2/1/05
Period: AM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2025 w/ project
N/S St: Ward Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	2	3	1	2	1	1	2	1	1
LGConfig	L	TR		L	T	R	L	T	R	L	T	R
Volume	315	1987	2	432	2076	158	96	70	81	166	162	248
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			0			16			41			124

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	35.5	69.0					14.0	21.5		
Yellow	4.0	4.0					4.0	4.0		
All Red	1.0	1.0					1.0	1.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	402	1814	0.84	0.22	76.7	E		
TR	2212	5130	0.97	0.43	61.9	E	63.9	E
Westbound								
L	781	3522	0.58	0.22	56.7	E		
T	2213	5131	0.99	0.43	73.0	E	68.0	E
R	700	1623	0.21	0.43	28.6	C		
Northbound								
L	292	3338	0.37	0.09	69.6	E		
T	243	1810	0.32	0.13	63.4	E	66.1	E
R	207	1538	0.21	0.13	62.2	E		
Southbound								
L	292	3338	0.60	0.09	73.7	E		
T	243	1810	0.70	0.13	75.5	E	73.9	E
R	207	1538	0.63	0.13	71.9	E		

Intersection Delay = 66.7 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 2/1/05
Period: PM Peak
Project ID:
E/W St: Ala Moana Boulevard

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2025 w/ project
N/S St: Ward Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	1	3	0	2	3	1	2	1	1	2	1	1
LGConfig	L	TR		L	T	R	L	T	R	L	T	R
Volume	309	2733	14	200	1603	299	274	161	348	263	114	343
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			1			30			174			172

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A	A			NB	Left	A			
Thru		A	A			Thru		A		
Right		A	A			Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru			A			Thru		A		
Right			A			Right		A		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	13.5	22.0	66.5				18.0	25.0		
Yellow	0.0	0.0	4.0				4.0	4.0		
All Red	0.0	0.0	1.0				1.0	1.0		

Cycle Length: 160.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	402	1814	0.80	0.22	70.9	E		
TR	2836	5127	1.01	0.55	78.5	E	77.8	E
Westbound								
L	297	3522	0.71	0.08	79.4	E		
T	2133	5131	0.79	0.42	42.8	D	45.2	D
R	675	1623	0.42	0.42	33.5	C		
Northbound								
L	376	3338	0.77	0.11	78.7	E		
T	283	1810	0.60	0.16	66.3	E	75.6	E
R	240	1538	0.76	0.16	79.3	E		
Southbound								
L	376	3338	0.74	0.11	76.5	E		
T	283	1810	0.42	0.16	62.0	E	73.9	E
R	240	1538	0.75	0.16	77.8	E		

Intersection Delay = 66.4 (sec/veh) Intersection LOS = E

```
              HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                             Inter.:
Agency:                                 Area Type: All other areas
Date:   3/21/2005                       Jurisd:
Period: AM Peak                         Year  : Year 2025 w/ project
Project ID:
E/W St: Ilalo St                        N/S St: Forrest St

_________________________SIGNALIZED INTERSECTION SUMMARY_____________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
           |_______________|_______________|_______________|_______________|
No. Lanes  |  0    2    0  |  0    2    0  |  1    1    0  |  1    1    0  |
LGConfig   |      LTR      | DefL  TR      | L     TR      | L     TR      |
Volume     |115  647  446  |130  279  107  |61   0    24   |15   43   87   |
Lane Width |     12.0      |12.0 12.0      |12.0 12.0      |12.0 12.0      |
RTOR Vol   |           45  |           11  |            2  |            9  |
_____________________________________________________________________________
Duration     1.00      Area Type: All other areas
______________________________Signal Operations______________________________
Phase Combination 1     2     3     4 |            5     6     7     8
EB  Left           A                  | NB  Left   A
    Thru           A                  |     Thru   A
    Right          A                  |     Right  A
    Peds                              |     Peds
WB  Left           A                  | SB  Left   A
    Thru           A                  |     Thru   A
    Right          A                  |     Right  A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green             55.5                            24.5
Yellow            4.0                             4.0
All Red           1.0                             1.0
                                                   Cycle Length: 90.0    secs
____________________Intersection Performance Summary________________________
Appr/   Lane        Adj Sat      Ratios         Lane Group     Approach
Lane    Group      Flow Rate   ___________     __________     __________
Grp     Capacity      (s)      v/c     g/C     Delay LOS      Delay LOS
_____________________________________________________________________________
Eastbound

LTR     1711       2775        0.72    0.62    13.3   B       13.3   B

Westbound
DefL    191        310         0.72    0.62    24.9   C
TR      1073       1740        0.37    0.62    8.8    A       12.9   B

Northbound
L       333        1222        0.19    0.27    25.4   C
TR      419        1538        0.05    0.27    24.3   C       25.1   C

Southbound
L       366        1343        0.04    0.27    24.2   C
TR      445        1634        0.29    0.27    26.2   C       26.0   C

        Intersection Delay = 14.6  (sec/veh)   Intersection LOS = B
_____________________________________________________________________________
```

```
              HCS2000: Signalized Intersections Release 4.1e

Analyst: CL                             Inter.:
Agency:                                 Area Type: All other areas
Date:   3/21/2005                       Jurisd:
Period: PM Peak                         Year  : Year 2025 w/ project
Project ID:
E/W St: Ilalo St                        N/S St: Forrest St

_________________________SIGNALIZED INTERSECTION SUMMARY_____________________
           |  Eastbound    |  Westbound    |  Northbound   |  Southbound   |
           | L    T    R   | L    T    R   | L    T    R   | L    T    R   |
           |_______________|_______________|_______________|_______________|
No. Lanes  |  0    2    0  |  0    2    0  |  1    1    0  |  1    1    0  |
LGConfig   |      LTR      |      LTR      | L     TR      | L     TR      |
Volume     |12   299  81   |23   1134 84   |394  0    153  |5    8    348  |
Lane Width |     12.0      |     12.0      |12.0 12.0      |12.0 12.0      |
RTOR Vol   |           8   |           8   |           15  |           35  |
_____________________________________________________________________________
Duration     1.00      Area Type: All other areas
______________________________Signal Operations______________________________
Phase Combination 1     2     3     4 |            5     6     7     8
EB  Left           A                  | NB  Left   A     A
    Thru           A                  |     Thru   A     A
    Right          A                  |     Right  A     A
    Peds                              |     Peds
WB  Left           A                  | SB  Left         A
    Thru           A                  |     Thru         A
    Right          A                  |     Right        A
    Peds                              |     Peds
NB  Right                             | EB  Right
SB  Right                             | WB  Right
Green             37.5                            19.5  23.0
Yellow            4.0                             0.0   4.0
All Red           1.0                             0.0   1.0
                                                   Cycle Length: 90.0    secs
____________________Intersection Performance Summary________________________
Appr/   Lane        Adj Sat      Ratios         Lane Group     Approach
Lane    Group      Flow Rate   ___________     __________     __________
Grp     Capacity      (s)      v/c     g/C     Delay LOS      Delay LOS
_____________________________________________________________________________
Eastbound

LTR     1158       2780        0.35    0.42    18.1   B       18.1   B

Westbound

LTR     1339       3214        0.97    0.42    52.8   D       52.8   D

Northbound
L       457        1719        0.91    0.47    50.4   D
TR      726        1538        0.20    0.47    14.0   B       40.9   D

Southbound
L       307        1203        0.02    0.26    25.1   C
TR      395        1545        0.85    0.26    50.9   D       50.6   D

        Intersection Delay = 44.6  (sec/veh)   Intersection LOS = D
_____________________________________________________________________________
```

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 4/12/2005
Period: AM Peak
Project ID:
E/W St: Ilalo St

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2025 w/ project
N/S St: Keawe St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	2	0	0	2	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	8	368	310	160	412	33	80	5	25	0	95	24
Lane Width		12.0			12.0		12.0	12.0		12.0	12.0	
RTOR Vol			31			3			3			2

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4
EB Left	A			
EB Thru	A			
EB Right	A			
EB Peds				
WB Left	A			
WB Thru	A			
WB Right	A			
WB Peds				
NB Right				
SB Right				
Green	44.5			
Yellow	4.0			
All Red	1.0			

Phase Combination	5	6	7	8
NB Left	A			
NB Thru	A			
NB Right	A			
NB Peds				
SB Left	A			
SB Thru	A			
SB Right	A			
SB Peds				
EB Right				
WB Right				
Green	35.5			
Yellow	4.0			
All Red	1.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	1511	3056	0.46	0.49	15.1	B	15.1	B
Westbound								
LTR	1032	2068	0.61	0.49	17.6	B	17.6	B
Northbound								
L	484	1227	0.17	0.39	17.9	B		
TR	626	1587	0.04	0.39	16.8	B	17.6	B
Southbound								
L	527	1337	0.00	0.39	16.5	B		
TR	694	1759	0.18	0.39	17.9	B	17.9	B

Intersection Delay = 16.5 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1e

Analyst: CL
Agency:
Date: 4/12/2005
Period: PM Peak
Project ID:
E/W St: Ilalo St

Inter.:
Area Type: All other areas
Jurisd:
Year : Year 2025 w/ project
N/S St: Keawe St

SIGNALIZED INTERSECTION SUMMARY

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
No. Lanes	0	2	0	0	2	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	4	378	75	30	720	28	385	0	115	0	30	136
Lane Width		12.0			12.0		12.0	12.0		12.0	12.0	
RTOR Vol			8			3			12			14

Duration 1.00 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4
EB Left	A			
EB Thru	A			
EB Right	A			
EB Peds				
WB Left	A			
WB Thru	A			
WB Right	A			
WB Peds				
NB Right				
SB Right				
Green	37.0			
Yellow	4.0			
All Red	1.0			

Phase Combination	5	6	7	8
NB Left	A			
NB Thru	A			
NB Right	A			
NB Peds				
SB Left	A			
SB Thru	A			
SB Right	A			
SB Peds				
EB Right				
WB Right				
Green	43.0			
Yellow	4.0			
All Red	1.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	1314	3197	0.36	0.41	18.5	B	18.5	B
Westbound								
LTR	1297	3154	0.63	0.41	22.0	C	22.0	C
Northbound								
L	567	1186	0.71	0.48	23.0	C		
TR	735	1538	0.15	0.48	13.3	B	20.9	C
Southbound								
L	594	1244	0.00	0.48	12.3	B		
TR	761	1592	0.21	0.48	13.8	B	13.8	B

Intersection Delay = 20.2 (sec/veh) Intersection LOS = C

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Coral St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	101	292			571	185
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	106	307			601	194
Percent Heavy Vehicles	5	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	2			2	0
Configuration	LT	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				17		34
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				17		35
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	106					17		35
C(m) (vph)	803					202		593
v/c	0.13					0.08		0.06
95% queue length	0.46					0.27		0.19
Control Delay	10.2					24.5		11.5
LOS	B					C		B
Approach Delay							15.7	
Approach LOS							C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Coral St
Intersection Orientation: EW Study period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	18	475			501	53
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	18	500			527	55
Percent Heavy Vehicles	5	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	2			2	0
Configuration	LT	T			T	TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				67		277
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				70		291
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes				1		1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT					L		R
v (vph)	18					70		291
C(m) (vph)	968					292		697
v/c	0.02					0.24		0.42
95% queue length	0.06					0.94		2.13
Control Delay	8.8					21.2		13.9
LOS	A					C		B
Approach Delay							15.3	
Approach LOS							C	

HCS2000: Unsignalized Intersections Release 4.1d

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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Cooke St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	171	138	5	5	617	30	5	20	5	7	20	129
% Thrus Left Lane		20			51							

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	208	121	335	349	5	26	7	156
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	208	121	335	349	5	26	7	156
Left-Turn	180	0	5	0	5	0	7	0
Right-Turn	0	5	0	31	0	5	0	135
Prop. Left-Turns	0.9	0.0	0.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.9
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.5	0.1	0.1	0.0	0.6	-0.0	0.6	-0.5

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	208	121	335	349	5	26	7	156
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.18	0.11	0.30	0.31	0.00	0.02	0.01	0.14
hd, final value	6.43	5.97	5.63	5.56	7.67	7.03	7.41	6.30
x, final value	0.37	0.20	0.52	0.54	0.01	0.05	0.01	0.27
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	4.1	3.7	3.3	3.3	5.4	4.7	5.1	4.0

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	208	121	335	349	5	26	7	156
Service Time	4.1	3.7	3.3	3.3	5.4	4.7	5.1	4.0
Utilization, x	0.37	0.20	0.52	0.54	0.01	0.05	0.01	0.27
Dep. headway, hd	6.43	5.97	5.63	5.56	7.67	7.03	7.41	6.30
Capacity	458	371	585	599	255	276	257	406
Delay	12.93	10.17	14.48	14.71	10.45	10.11	10.22	11.37
LOS	B	B	B	B	B	B	B	B
Approach:								
Delay	11.91		14.60		10.17		11.32	
LOS	B		B		B		B	

Intersection Delay 13.31 Intersection LOS B

HCS2000: Unsignalized Intersections Release 4.1d

Wilson Okamoto
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Phone: Fax:
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ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Cooke St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	159	383	0	0	419	21	5	30	5	10	10	135
% Thrus Left Lane		30			50							

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	287	283	220	243	5	36	10	152
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	287	283	220	243	5	36	10	152
Left-Turn	167	0	0	0	5	0	10	0
Right-Turn	0	0	0	22	0	5	0	142
Prop. Left-Turns	0.6	0.0	0.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.9
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.4	0.1	0.1	0.0	0.6	-0.0	0.6	-0.6

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	287	283	220	243	5	36	10	152
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.26	0.25	0.20	0.22	0.00	0.03	0.01	0.14
hd, final value	6.10	5.81	5.95	5.88	7.74	7.15	7.50	6.34
x, final value	0.49	0.46	0.36	0.40	0.01	0.07	0.02	0.27
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.8	3.5	3.6	3.6	5.4	4.8	5.2	4.0

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	287	283	220	243	5	36	10	152
Service Time	3.8	3.5	3.6	3.6	5.4	4.8	5.2	4.0
Utilization, x	0.49	0.46	0.36	0.40	0.01	0.07	0.02	0.27
Dep. headway, hd	6.10	5.81	5.95	5.88	7.74	7.15	7.50	6.34
Capacity	537	533	470	493	255	286	260	402
Delay	14.53	13.36	12.03	12.45	10.53	10.40	10.36	11.36
LOS	B	B	B	B	B	B	B	B
Approach:								
Delay	13.95		12.25		10.41		11.30	
LOS	B		B		B		B	

Intersection Delay 12.85 Intersection LOS B

```
              HCS2000: Unsignalized Intersections Release 4.1d

_______________________TWO-WAY STOP CONTROL SUMMARY_____________________________

Analyst:
Agency/Co.:
Date Performed:       3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year:        Year 2025 w/ project
Project ID:
East/West Street:     Ilalo St
North/South Street:   Koula St
Intersection Orientation: EW                 Study period (hrs):  1.00

______________________Vehicle Volumes and Adjustments___________________________
Major Street:  Approach        Eastbound                Westbound
               Movement     1       2       3    |  4      5       6
                            L       T       R    |  L      T       R
________________________________________________________________________________
Volume                      11      134                   593      3
Peak-Hour Factor, PHF       0.95    0.95                  0.95     0.95
Hourly Flow Rate, HFR       11      141                   624      3
Percent Heavy Vehicles      5       --      --            --       --
Median Type/Storage         Undivided              /
RT Channelized?
Lanes                          0    2                     2    0
Configuration                   LT  T                     T    TR
Upstream Signal?                    No                    No

________________________________________________________________________________
Minor Street:  Approach        Northbound               Southbound
               Movement     7       8       9    |  10     11      12
                            L       T       R    |  L      T       R
________________________________________________________________________________
Volume                                              0              54
Peak Hour Factor, PHF                               0.95           0.95
Hourly Flow Rate, HFR                               0              56
Percent Heavy Vehicles                              5              5
Percent Grade (%)                   0                      0
Flared Approach:  Exists?/Storage              /                        /
Lanes                                                 1        1
Configuration                                          L      R
________________________________________________________________________________

_________________Delay, Queue Length, and Level of Service_______________________
Approach          EB     WB         Northbound             Southbound
Movement          1      4     |  7      8      9     |  10     11     12
Lane Config       LT           |                      |  L             R
________________________________________________________________________________
v (vph)           11                                     0             56
C(m) (vph)        931                                    353           673
v/c               0.01                                   0.00          0.08
95% queue length  0.04                                   0.00          0.27
Control Delay     8.9                                    15.2          10.8
LOS                A                                     C             B
Approach Delay                                                  10.8
Approach LOS                                                    B
________________________________________________________________________________
```

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              HCS2000: Unsignalized Intersections Release 4.1d

_______________________TWO-WAY STOP CONTROL SUMMARY_____________________________

Analyst:
Agency/Co.:
Date Performed:       3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year:        Year 2025 w/ project
Project ID:
East/West Street:     Ilalo St
North/South Street:   Koula St
Intersection Orientation: EW                 Study period (hrs):  1.00

______________________Vehicle Volumes and Adjustments___________________________
Major Street:  Approach        Eastbound                Westbound
               Movement     1       2       3    |  4      5       6
                            L       T       R    |  L      T       R
________________________________________________________________________________
Volume                      28      365                   408      13
Peak-Hour Factor, PHF       0.95    0.95                  0.95     0.95
Hourly Flow Rate, HFR       29      384                   429      13
Percent Heavy Vehicles      5       --      --            --       --
Median Type/Storage         Undivided              /
RT Channelized?
Lanes                          0    2                     2    0
Configuration                   LT  T                     T    TR
Upstream Signal?                    No                    No

________________________________________________________________________________
Minor Street:  Approach        Northbound               Southbound
               Movement     7       8       9    |  10     11      12
                            L       T       R    |  L      T       R
________________________________________________________________________________
Volume                                              0              32
Peak Hour Factor, PHF                               0.95           0.95
Hourly Flow Rate, HFR                               0              33
Percent Heavy Vehicles                              5              5
Percent Grade (%)                   0                      0
Flared Approach:  Exists?/Storage              /                        /
Lanes                                                 1        1
Configuration                                          L      R
________________________________________________________________________________

_________________Delay, Queue Length, and Level of Service_______________________
Approach          EB     WB         Northbound             Southbound
Movement          1      4     |  7      8      9     |  10     11     12
Lane Config       LT           |                      |  L             R
________________________________________________________________________________
v (vph)           29                                     0             33
C(m) (vph)        1093                                   365           774
v/c               0.03                                   0.00          0.04
95% queue length  0.08                                   0.00          0.13
Control Delay     8.4                                    14.9          9.9
LOS                A                                     B             A
Approach Delay                                                  9.9
Approach LOS                                                    A
________________________________________________________________________________
```

HCS2000: Unsignalized Intersections Release 4.1d

Wilson Okamoto
Wilson Okamoto

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: AM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Ahui St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
Volume	32	92	10	9	502	31	45	0	82	60	15	49
% Thrus Left Lane		50			50							

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	81	58	273	296	47	86	63	66
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	81	58	273	296	47	86	63	66
Left-Turn	33	0	9	0	47	0	63	0
Right-Turn	0	10	0	32	0	86	0	51
Prop. Left-Turns	0.4	0.0	0.0	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.2	0.0	0.1	0.0	1.0	0.0	0.8
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.3	-0.0	0.1	0.0	0.6	-0.6	0.6	-0.5

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	81	58	273	296	47	86	63	66
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.07	0.05	0.24	0.26	0.04	0.08	0.06	0.06
hd, final value	6.24	5.91	5.56	5.47	6.99	5.79	6.99	5.94
x, final value	0.14	0.10	0.42	0.45	0.09	0.14	0.12	0.11
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	3.9	3.6	3.3	3.2	4.7	3.5	4.7	3.6

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	81	58	273	296	47	86	63	66
Service Time	3.9	3.6	3.3	3.2	4.7	3.5	4.7	3.6
Utilization, x	0.14	0.10	0.42	0.45	0.09	0.14	0.12	0.11
Dep. headway, hd	6.24	5.91	5.56	5.47	6.99	5.79	6.99	5.94
Capacity	331	308	523	546	297	336	313	316
Delay	9.95	9.23	12.30	12.62	10.39	9.41	10.66	9.37
LOS	A	A	B	B	B	A	B	A
Approach:								
Delay	9.65		12.47		9.76		10.00-	
LOS	A		B		A		A	

Intersection Delay 11.36 Intersection LOS B

HCS2000: Unsignalized Intersections Release 4.1d

Wilson Okamoto
Wilson Okamoto

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: CL
Agency/Co.:
Date Performed: 3/21/2005
Analysis Time Period: PM Peak
Intersection:
Jurisdiction:
Units: U. S. Customary
Analysis Year: Year 2025 w/ project
Project ID:
East/West Street: Ilalo St
North/South Street: Ahui St

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R
Volume	41	254	70	69	149	40	214	0	381	72	106	58
% Thrus Left Lane		55			50							

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Configuration	LT	TR	LT	TR	L	TR	L	TR
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flow Rate	189	194	149	120	225	401	75	172
% Heavy Veh	5	5	5	5	5	5	5	5
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 1.00 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rates:								
Total in Lane	189	194	149	120	225	401	75	172
Left-Turn	43	0	72	0	225	0	75	0
Right-Turn	0	73	0	42	0	401	0	61
Prop. Left-Turns	0.2	0.0	0.5	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	0.4	0.0	0.3	0.0	1.0	0.0	0.4
Prop. Heavy Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.2	-0.2	0.3	-0.2	0.6	-0.6	0.6	-0.2

Worksheet 4 - Departure Headway and Service Time

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow rate	189	194	149	120	225	401	75	172
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.17	0.17	0.13	0.11	0.20	0.36	0.07	0.15
hd, final value	7.66	7.28	7.99	7.50	7.61	6.41	8.18	7.43
x, final value	0.40	0.39	0.33	0.25	0.48	0.71	0.17	0.36
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	5.4	5.0	5.7	5.2	5.3	4.1	5.9	5.1

Worksheet 5 - Capacity and Level of Service

	Eastbound L1	Eastbound L2	Westbound L1	Westbound L2	Northbound L1	Northbound L2	Southbound L1	Southbound L2
Flow Rate	189	194	149	120	225	401	75	172
Service Time	5.4	5.0	5.7	5.2	5.3	4.1	5.9	5.1
Utilization, x	0.40	0.39	0.33	0.25	0.48	0.71	0.17	0.36
Dep. headway, hd	7.66	7.28	7.99	7.50	7.61	6.41	8.18	7.43
Capacity	439	444	399	370	465	553	325	422
Delay	15.49	14.67	14.62	12.70	17.18	24.69	12.56	14.21
LOS	C	B	B	B	C	C	B	B
Approach:								
Delay	15.08		13.76		21.99		13.71	
LOS	C		B		C		B	

Intersection Delay 17.46 Intersection LOS C

APPENDIX B

Cultural Impact Assessment

6573-01
March 7, 2002

University of Hawai'i Health and Wellness Center

CULTURAL RESOURCES

The project site is located on fill land that is identified as the near-shore waters and coral reef of Ka'ākaukukui on early historical maps. Ka'ākaukukui is an 'ili awarded to Victoria Kamāmalu in the Great Mahele of 1848 that is situated between the areas traditionally referred to as Kewalo and Kaka'ako. Historical maps of the area from the 1800s indicate a "Beach Road" that follows along the shoreline and makai boundary of the 'ili (see Figure 1). This road approximately coincides with the present day alignment of Ala Moana Boulevard.

The lands of Ka'ākaukukui, Kaka'ako and Kewalo were in close proximity to Kou, a favorite sheltered harbor of O'ahu's chiefly class. In 1809 under the reign of King Kamehameha I, the seat of government was moved from Hawai'i Island to Kou which quickly developed into Honolulu Harbor and Downtown Honolulu. The surrounding area, which included Ka'ākaukukui, grew from a coastal fishing village to support the new maritime industry and increased activities.

In the 1840s during the reign of Kauikeaouli Kamehameha III, son of Kamehameha I, land tenure in Hawai'i entered a transitional period terminating in the "Great Mahele" of 1848. King Kamehameha III who inherited from his brother control of all the lands with the kingdom chose to provide the opportunity for fee simple ownership of land to his chiefs and people. The maka'āinana, the native tenants, were able to make claims for and receive title to their kuleana, the areas of land which they personally used. Kauikeaouli Kamehameha III after reserving certain lands for himself as his own private property, surrendered the majority of the lands to his chiefs and people. The project site is located in what were the nearshore waters of the 'ili of Ka'ākaukukui, of which the majority of the lands, or 125 acres, was awarded to Victoria Kamāmalu through Land Commission Award 7713. Smaller kuleana lands were also awarded to seven other native tenants.

Claims by native tenants are recorded in the *Native and Foreign Registers* which typically includes information regarding the location of the claim, and sometimes information regarding the type of use. Additional information regarding the claims and use of the land can also be found in *Native and Foreign Testimony* records. A review of Native and Foreign Register and Testimony records revealed that claimants registered for house lots, fishponds, salt beds and cultivation areas including mauka kalo patches.

In 1919 the Territory of Hawai'i acquired the land from Bishop Estate which included the lands inherited by Princess Bernice Pauahi Bishop from Victoria Kamāmalu. By this time a retaining wall had been constructed along the approximate alignment of the present Olomehani Street and the area makai of Ala Moana Boulevard was filled (see

Figure 2). During this period of development a large settlement of squatters became established and by 1924 the Territorial government was evicting people from "Squattersville." The following history of this period of change for the area can be found in *The Beaches of O'ahu* by John R.K. Clark.

> "The shoreline land that Squattersville occupied was known as Ka'ākaukukui, commonly shortened to 'Ākaukukui. The majority of the homes were comfortable and sturdily built. The dwellings that lined the seashore, where the present Olomehani Street now runs, were protected from the ocean by a low sea wall about three feet high. Relatives and friends of the residents often went there to spend weekends and summers. By the mid-1920s, the community numbered about 700 Hawaiians and part-Hawaiians, but because of the illegality of their settlement all of the families were evicted by May 1926 and all of the dwellings were razed.
>
> During the 1930s and 1940s, the Ka'ākaukukui area continued to be heavily utilized as a fishing and swimming area, especially by children from the nearby community of Kaka'ako. The children surfed on redwood planks in the break they called 'Stonewall.' Many varieties of fish were abundant. Younger divers were warned by old-time residents to stay away from the large shark hole on the Waikīkī side of Kewalo Channel. Many people came to this area to pick *limu* and *wana*, and also to catch squid on the shallow reef.
>
> In August 1948 a severe change took place. The City and County began work on a project to provide a dump for the noncombustible material from the nearby incinerator. A huge seawall was constructed, 10 feet high, 10 feet wide on top, and 30 feet wide at the base, and it extended 500 feet seaward from the old shoreline. From its outer extremity, along the edge of Kewalo Channel, the wall was continued parallel to the coast all the way to Fort Armstrong... With the completion of the seawall in 1949, filling operations began and in the mid-1950s the shallow reef of Ka'ākaukukui was completely covered over. Twenty-nine acres of new land had been added to the old shoreline. (Clark, p. 64)

Since the area makai of Ala Moana Boulevard is comprised of fill land, the project site is located on previously submerged lands. Nevertheless, in the early 1900s these lands supported an unauthorized fishing village until the Territorial government eventually evicted the squatters in 1926.

Although the existing shoreline is the result of land-filling activities that took place in the early 1900s and mid-1950s, the coastline continues to be used for fishing, shoreline gathering and recreational activities including swimming and surfing.

In the vicinity of the project site, these ocean-related activities primarily occur at Kaka'ako Waterfront Park which is located immediately makai of the project site.

Access to the Park and shoreline is via surface streets terminating at the Park's parking lot which is typically where ocean goers leave their cars.

Impacts and Mitigation Measures

The proposed project will have no impact on cultural resources or activities. In their letter dated February 18, 1998 the State Historic Preservation Division determined that "because the area makai of Ala Moana Boulevard is comprised of fill lands, we believe that the development of the area will have 'no effect' on subsurface cultural deposits because it is unlikely any are present."

The proposed project will not affect access to Kaka'ako Waterfront Park or the shoreline. In addition, approximately 850 on-site and off-site parking stalls will be provided for faculty, staff, and students to help ensure that public parking at the Park is not affected.

Bibliography

Clark, John R.K. *The Beaches of O'ahu.* 1977

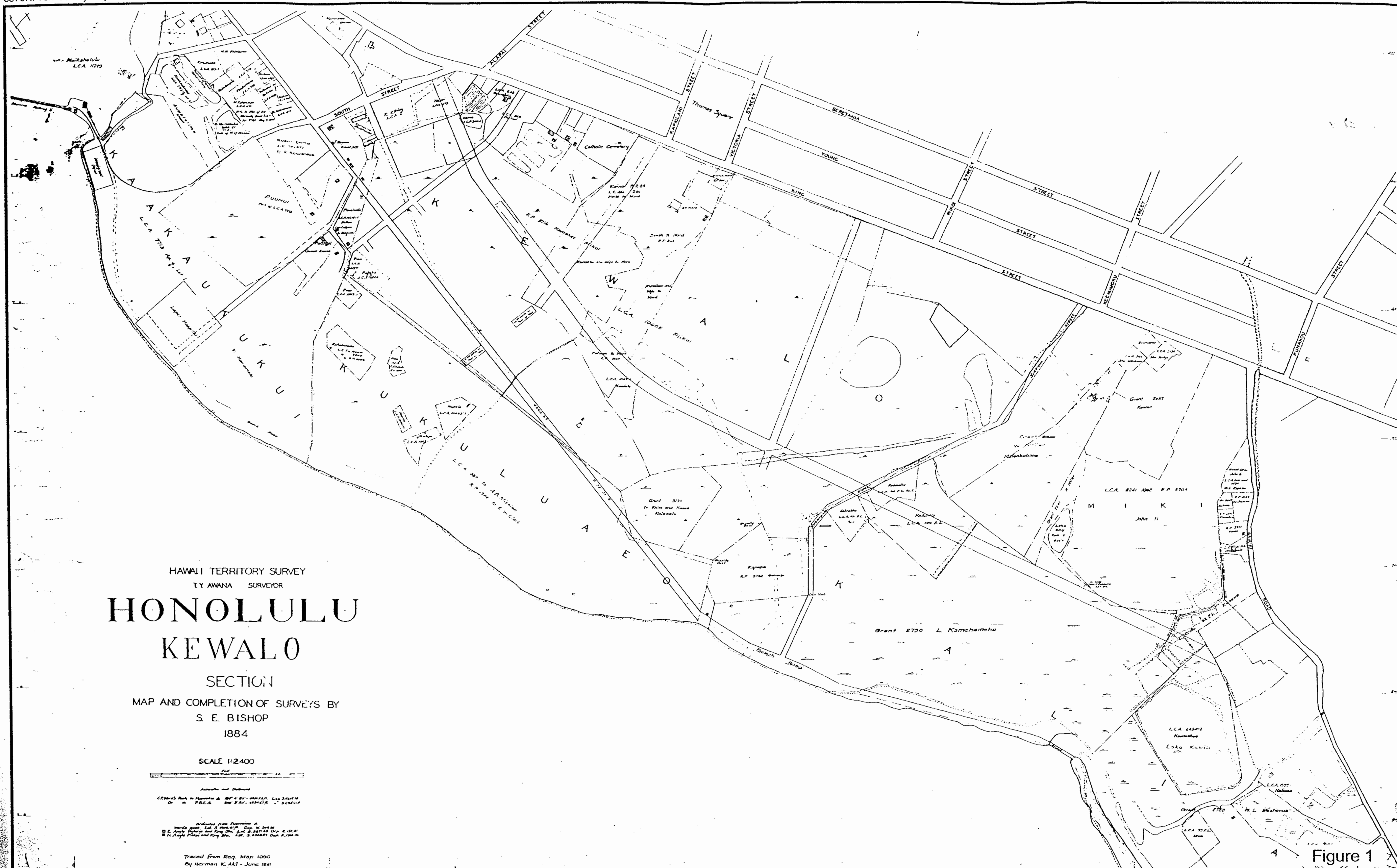
HAWAII TERRITORY SURVEY
T.Y. AWANA SURVEYOR
HONOLULU
KEWALO
SECTION
MAP AND COMPLETION OF SURVEYS BY
S. E. BISHOP
1884
SCALE 1:2400
Traced from Reg. Map 1090
By Herman K. Aki - June 1951
SOUTH STREET
ALAPAI STREET
KAPIOLANI STREET
VICTORIA STREET
BERETANIA
YOUNG STREET
KING STREET
PIIKOI STREET
KEEAUMOKU STREET
PUNAHOU
Thomas Square
Catholic Cemetery
Grant 2730 L. Kamehameha
L.C.A. 8241 Ahu. R.P. 5704
John Ii
Loko Kuwili

Figure 1

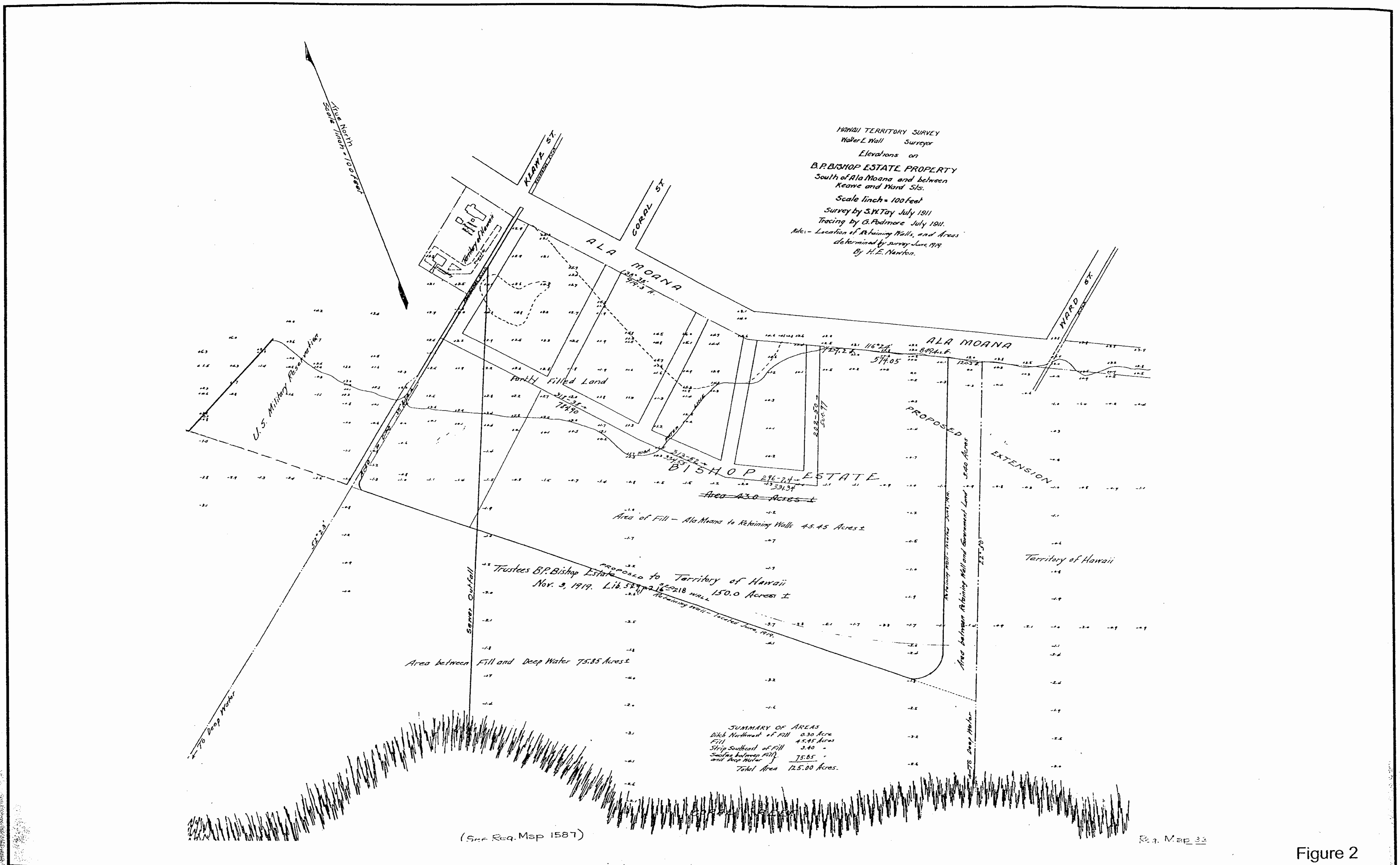
HAWAII TERRITORY SURVEY
Walter E. Wall Surveyor
Elevations on
B.P. BISHOP ESTATE PROPERTY
South of Ala Moana and between
Keawe and Ward Sts.
Scale 1 inch = 100 feet
Survey by S.W. Tay July 1911
Tracing by G. Podmore July 1911.
Note: - Location of Retaining Walls, and Areas
determined by survey June, 1919.
By H.E. Newton.
True North
Scale 1 inch = 100 feet
KEAWE ST.
CORAL ST.
WARD ST.
ALA MOANA
ALA MOANA
Territory of Hawaii
U.S. Military Reservation
Partly Filled Land
BISHOP ESTATE
~~Area 43.0 Acres ±~~
Area of Fill – Ala Moana to Retaining Walls 45.45 Acres ±
PROPOSED EXTENSION
Territory of Hawaii
Trustees B.P. Bishop Estate PROPOSED to Territory of Hawaii
Nov. 3, 1919. Lib. 529 p. 216 150.0 Acres ±
Sewer Outfall
Area between Fill and Deep Water 75.85 Acres ±
To Deep Water
To Deep Water
SUMMARY OF AREAS
Ditch Northwest of Fill 0.30 Acre
Fill 45.45 Acres
Strip Southeast of Fill 3.40 "
Section between Fill and Deep Water 75.85 "
Total Area 125.00 Acres.
(See Reg. Map 1587)
Reg. Map 33

Figure 2

APPENDIX C

State Historic Preservation Letter and Determination of No Effect from 1998 Makai Area Plan Supplemental Environmental Impact Statement

NJAMIN J. CAYETANO
GOVERNOR OF HAWAII

RECEIVED
MAR 4 1998
WILSON OKAMOTO & ASSOC., INC.

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND DIVISION
STATE PARKS
WATER AND LAND DEVELOPMENT

February 18, 1998

Susan Tamura
Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, Hawaii 96813

LOG NO: 21043 ✓
DOC NO: 9802EJ06

Dear Ms. Tamura:

SUBJECT: **Chapter 6E-8 Historic Preservation Review of a Supplemental Environmental Impact Statement Preparation Notice: Kakaako Makai Area Plan**
Kakaako, Kona, O'ahu
TMK: 2-1-15, 58-60

Thank you for the opportunity to review the Supplemental Environmental Impact Statement Preparation Notice for the revisions to the Kakaako Makai Area Plan, December 1997.

In November 1989 our office commented on the Draft Supplemental EIS for Kakaako Makai Area Plan (Log. 1696b/1939). We noted that since the historic buildings within the Kakaako Makai Area, the Department of Health Building, the U. S. Immigration Station, and the former Ala Moana Wastewater Pump Station, were scheduled for preservation, we believed that the plan would result in "no adverse effect" to these historic sites.

In December 1994, we provided comment on the expansion of the Draft Makai Area Plan *mauka* of Ala Moana Boulevard and commented that this area "includes an area of former sandy beaches where traditional Hawaiian dwelling were located in the past. It is likely that unmarked human burials are also present in the area of the proposed expansion." We also stated that "Our review of projects in this proposed expansion area will take into account the likelihood that the remains of dwelling sites and human burials are extant below the surface here."(Log. no. 13180)

The current Kakaako Makai Area Plan no longer includes the area *mauka* of Ala Moana boulevard. Because the area *makai* of Ala Moana Boulevard is comprised of fill lands, we believe that the development of the area will have "no effect" on subsurface cultural deposits because it is unlikely any are present. Also, the plan in section 3.2.5 states that the historic buildings will be preserved; therefore, we believe that the plan would have "no adverse effect" on these historic sites.

If you have any questions please call Elaine Jourdane at 587-0014.

Aloha,

Don Hibbard, Administrator
Historic Preservation Division

EJ:jk

c: ✓ Rodney Funakoshi, Wilson Okamoto & Associates, Inc., 1907 S. Beretania St., Hon. 96826