



**HAWAII
COMMUNITY
DEVELOPMENT
AUTHORITY**

DRAFT

**KALAELOA
MASTER PLAN**

November 2023

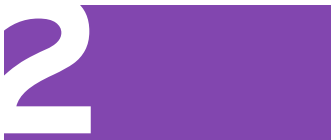
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SETTING THE STAGE *UNDERSTANDING THE PIECES*

1.0 Plan Overview

1.1 Project Background

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1.3 Stakeholder Engagement



1.0 Plan Overview

1.0.1 Background of the Master Plan Amendment

In June 2002, Governor Benjamin Cayetano signed into law Senate Bill 2702 (becoming Act 184) which transferred responsibility for Kalaeloa from the Naval Air Station Barbers Point (NASBP) Redevelopment Commission to the Hawai'i Community Development Authority (HCDA). Pursuant to Act 184, the Kalaeloa Community Development District (KCDD) was established, comprising approximately 3,700 acres of land that included all of the land within the former NASBP.

Pursuant to Hawai'i Revised Statutes (HRS) Chapter 206E, which requires that a master plan be developed following the establishment of the KCDD, the Kalaeloa Master Plan (Plan) was adopted in 2006. The Plan recognized the unique opportunity to redevelop the former NASBP through the adoption of a Strategic Plan, envisioning Kalaeloa as a "Center for Excellence" or Wahi Hookela within the 'Ewa region of O'ahu. This vision was founded on a set of core values aimed at striving for excellence in multiple disciplines, respect for the past, creating social and economic value, and community involvement.

At the time of the 2006 Plan's adoption, the complexity of the undertaking was acknowledged, including the likelihood of successes and setbacks along the way, as well as unpredictable events and market cycles. Since adoption of the 2006 Plan, the rail line is now under construction; the housing crisis has grown more acute; several housing projects have been developed surrounding the KCDD and throughout the 'Ewa Plain; and the 'Ewa Plain Battlefield Memorial has been established.

In recognition of these changes to the surrounding areas and the market, this Master Plan Amendment has been created in order to:

- Identify relevant changes from 2006 to present within and surrounding the KCDD;
- Identify favorable and detrimental conditions to redevelopment in the KCDD; and
- Refresh the information and data in the Master Plan and refine the Administrative Rules to reflect market realities and support redevelopment in the KCDD.

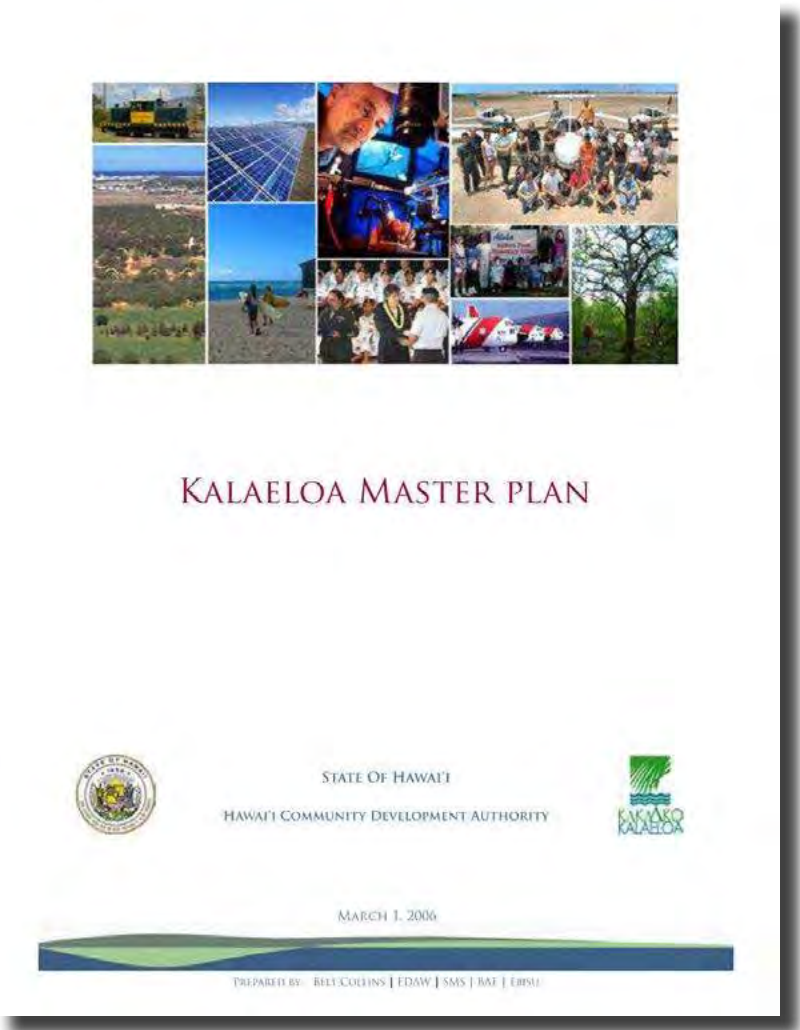


1.0.2 The Kalaeloa Master Plan

In 2020, the HCDA began the process of preparing this revision to the 2006 Kalaeloa Master Plan to navigate the next two decades. This Master Plan Amendment responds to the current and anticipated challenges facing redevelopment and charts an economically feasible and realistic course toward the vision of Kalaeloa as a Wahi Hookela.

The planning team conducted a concerted effort that involved the review of the 2006 Kalaeloa Master Plan and Urban Design Guidelines along with ancillary plans, studies, and other reference documents completed since then. Additionally, the planning team conducted interviews with stakeholders, met with government agencies, and held workshops with the community and HCDA to receive clarification and feedback on the direction and concepts being developed.

The Master Plan Amendment was written with the intent of distilling this information into an understandable planning document that offers the reader an overview of the opportunities and vision for Kalaeloa. In this regard, the Master Plan is organized in the following manner:



SOURCE: Kalaeloa Master Plan, Hawaii Community Development Authority, March 2006

- **Setting the Stage - Understanding the Pieces: Chapter 1** reviews the history of Kalaeloa pertaining to the closure of NASBP and past planning efforts. Chapter 1 also includes a description of the current setting of Kalaeloa in terms of land ownership, land uses, schools, transit, infrastructure, physical characteristics, protected species and habitat, cultural environment, and regional economy.
- **Kalaeloa Vision: Chapter 2** describes the conceptual framework for developing the land use plan through an overview of the major opportunities at Kalaeloa, including creating social value; providing new economic development and employment opportunities; balancing development; addressing regional traffic congestion; protecting open space and cultural and natural resources.
- **The Master Plan: Chapter 3** describes and illustrates the proposed land uses in Kalaeloa and summarizes the various areas for mixed use, airport, light industrial, military, institutions, open space, parks, and recreation.
- **Implementation: Chapter 4** summarizes the issues surrounding the successful implementation of the Master Plan, including infrastructure improvements, public services, financing, and governance.

1.1 Project Background

The area known for two centuries as Barbers Point takes its name from the wreck of the Arthur, a ship captained by Henry Barber in a hurricane in 1796. Barber and several of his crew struggled ashore near the site then known as Kalaeloa. Known as the legendary birthplace and burial ground of Hawaiian kings, this event indelibly linked his name to this part of the island. Some seventy years later, James Campbell purchased the land as part of his larger purchase of 41,000 acres of flat land in the 'Ewa district to be used in the production of sugar cane. Campbell, in turn leased the land to O'ahu Sugar, which began the association of this site with sugar cane.

The Navy's association with this site began in 1925 with the leasing of 150 acres from the Campbell estate. Around 1935, the Navy began the construction of 'Ewa Field adjacent to plantation housing for the nearby Ewa sugar mill. On December 7, 1941, as part of the attack on Pearl Harbor, 'Ewa Field was hit resulting in significant damage and loss of life. Thus, this battlefield site is an important landmark and in 2016, efforts to memorialize this ground resulted in the inclusion of the 'Ewa Plain Battlefield in the National Register of Historic Places.

In 1940 the Navy purchased approximately 3,500 acres of land at Barbers Point allowing it to expand 'Ewa Field as the Marine Corps Air Station (MCAS) and to construct the NASBP. The attack on Pearl Harbor preceded any construction on this site, but by 1943, NASBP became operational, quickly becoming a pivotal facility in servicing carrier-borne aircraft, a critical component in the Navy's effort to project air power in the Pacific theater as the "Crossroads of the Pacific."

1.1.1 Base Closure and Reuse Process

Despite its strategic importance throughout WWII and in the four decades that followed, in 1993, the U.S. Congress authorized the Department of Defense's recommendation for the closure of the NAS Barbers Point (Kalaeloa). During the closure process, federal real property disposal regulations required the Navy to first identify lands for retention, then offer excess lands to other federal agencies, then dispose of the remaining surplus to the State, City, and private parties.

When NAS Barbers Point formally closed on July 2, 1999, the Navy retained roughly 1,055 acres, designated approximately 457 acres of excess land for transfer to various federal agencies, and designated roughly 2,180 acres of the remaining land as surplus.

In 1994, the Hawai'i State Legislature established the NAS Barbers Point Redevelopment Commission. As the Local Reuse Authority, the Commission was responsible for preparing a plan for the conveyance and subsequent reuse of the surplus land at Kalaeloa.

1.1.2 Past Planning Efforts - Community Redevelopment Plan

On October 8, 1996, the NAS Barbers Point Reuse Commission adopted a Community Redevelopment Plan that identified State and City agencies interested in receiving lands and designated proposed uses of the surplus land. The Community Redevelopment Plan further served as the principal guiding document to coordinate the conveyance of surplus lands and in the preparation of an Environmental Impact Statement (EIS) for the disposal and reuse of the surplus land. Since its adoption, the Community Redevelopment Plan was amended five times between 1997 and 2001 to respond to new site conditions and changes in the interest of government agencies designated to receive surplus land.

1.1.3 Hawai'i Community Development Authority (HCDA)

In July 2002, Act 184 of the 2002 Hawai'i State Legislature (SB 2702, SD2, HD2, CD1) transferred redevelopment responsibility for Kalaeloa from the NAS Barbers Point Redevelopment Commission to the HCDA.

The HCDA assumed responsibility for the redevelopment of Kalaeloa, overseeing remaining conveyances, contract administration, promulgation of administrative rules, and other tasks relating to the Redevelopment Commission.

Pre 1700's

Early Hawai'ian

Kalaeloa (Long Point) the name describing the shape of the shoreline of this part of the 'Ewa Plain, is known as the legendary birthplace and burial ground of Hawaiian kings. It is the site of several Hawaiian and Tahitian coastal settlements which are in turn connected to other communities extending from Puuloa to Ko Olina.



1700-1800's

1796

Arthur Shipwreck

The Arthur sinks during a hurricane causing Henry Barber and other survivors to wash up near Kalaeloa, permanently linking Barber's name to this part of the island.

1848

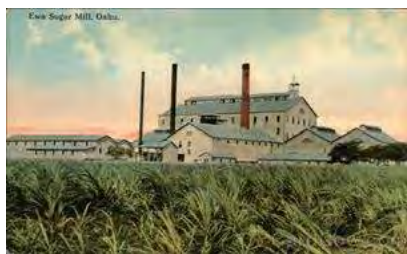
Mahele 'Aina

High Chiefess Keahikuni Kekauonohi claims Kalaeloa during Mahele 'Aina or land privatization.

1877

Sugar Era Begins

James Campbell moves from Maui to O'ahu and purchases Kalaeloa as part of his larger purchase of 41,000 acres of flat land in the 'Ewa district to be used in the production of sugar cane. Finding an abundance of artesian wells, Campbell, in turn, leases the land to the O'ahu Sugar conglomerate and begins the 100-year era of sugar on O'ahu.



Mid 1900's

1930

Navy Development

Navy begins building 'Ewa Field adjacent to plantation housing for the nearby 'Ewa sugar mill.

1940's

Navy Expansion

Navy purchases approximately 3,500 acres of land, allowing it to expand 'Ewa Field as the MCAS and to construct Barbers Point Naval Air Station.



1941

Date of Infamy

On December 7th as part of the attack on Pearl Harbor, other targets on O'ahu, including 'Ewa MCAS, are also hit resulting in considerable damage and loss of life. Barbers Point is not targeted as it is still under construction.

1942

Barbers Point Commission

April 15. NASBP is commissioned and becomes operational a year later, quickly becoming a pivotal facility in servicing carrier-borne aircraft.

1944

Barbers Point Expansion

NASBP expands to accommodate the servicing of up to four carrier air groups simultaneously.

1949

Coast Guard

The Coast Guard begins air operations at Barbers Point. The facility itself is designated Coastal Guard Air Station Barbers Point in 1965.

1952

MCAS Closure

'Ewa Field (MCAS) is officially closed as the runways are deemed too short for jet aircraft.

Late 1900's

1993

BRAC and BPRC

Upon the recommendation of the Base Realignment and Closure Commission (BRAC) to close Barbers Point NAS the State of Hawai'i establishes the Barbers Point Redevelopment Commission (BPRC) to facilitate the transition of the property on a state level. Among its recommendations is the establishment of the Kalaeloa Heritage Park to conduct research, preserve and document the remains of the cultural landscape of the ancient community that once lived on the site.

1999

Barbers Point Closure

NASBP closes and is renamed Kalaeloa. Lands not retained by the Navy are conveyed to other federal, state, or local government agencies such as the Department of Hawaiian Homelands (DHHL), the Hawai'i Department of Transportation (who operates Kalaeloa Airport) or sold to private landowners.



2000's

2002

Hawai'i Community Development Authority

Oversight of Kalaeloa is transferred to the HCDA.

2006

Kalaeloa Master Plan

The HCDA adopts the Kalaeloa Master Plan.

2012

FBI Building

Construction of the Honolulu field office for the Federal Bureau of Investigation (FBI) breaks ground in August 2012.

2012

Administrative Rules

The administrative rules that govern development in the Kalaeloa Community Development District are adopted in September 2012.

2020 - PRESENT

Master Plan and Administrative Rules Update

HCDA commenced the update process to the Kalaeloa Master Plan and Administrative Rules.

1.1.4 Historical Cultural Landscape

The Master Plan seeks to ensure the long-term protection of Kalaeloa’s historic sites and cultural landscapes which tell the story of its rich heritage. In recognition of each era’s significant contributions, the planning effort endeavors to assimilate the educational and stewardship opportunities into its long-term objectives. The appreciation of its past will inspire Kalaeloa’s creation of its own sense of place.

Pre-Contact Archaeological Cultural Landscape

Kalaeloa is located within the Honouliuli Ahupua’a on the island of Oahu and is associated with traditional Hawaiian land uses. It was known as the legendary birthplace of Hawaiian kings. ‘Kalaeloa’ or ‘Lae Loa’ were the earliest Hawaiian names for this locality found in historic maps and text. Lae meaning cape or point and loa translates to distance or length. ‘Kalaeloa’ may translate to “clear or calm stretch” of land or water. (Synthesis of Cultural Resource Studies of the ‘Ewa Plain, H. David Tuggle, PhD., M.J. Tomonari-Tuggle, M.A., International Archaeological Research Institute, Inc., Draft-October 1994.) Refer to Figure 1: Honouliuli Ahupua’a Map.

The area’s natural landscape is characterized by its distinctive geological features composed of limestone caves formed in the elevated coral terrain. This karst limestone landscape constitutes 80% of the Ewa Plain which represents the largest formation in the Central Pacific Basin.

These limestone “pit caves” were utilized in traditional Hawaiian ways of land use across the ‘Ewa Plain sites by its



FIGURE 1: Honouliuli Ahupua’a Map (Synthesis of Cultural Resource Studies of the ‘Ewa Plain, H. David Tuggle, PhD., M.J. Tomonari-Tuggle, M.A., International Archaeological Research Institute, Inc., October 1994.)

early inhabitants. They served as significant sources of fresh water and were interpreted as sacred sites. The soil on the floor of the larger pits were believed to have been used for cultivation. It has also been determined that other functions for these sinkholes included habitation, burial locales, wells, and trash deposition. (Sources: <https://kalaeloaheritagepark.org>; An Archaeological Inventory Survey Report for a Proposed Solar Farm in Kalaeloa, Honouliuli Ahupua’a, Ewa District, Oahu Island, Hawaii, Scientific Consultant Services, Inc., Draft June 2013.)

A network of pre-contact pathways or alaloa/alahahele allowed people to travel and trade goods outside of their ahupua’a. It was during the early 1790s that cartographer Lt. C.R.

Malden prepared a map that included Honouliuli which was the earliest cartographic documentation of the area. These trails became important connections for transportation during both the pre-contact and plantation eras. (Honouliuli Ewa Traditional Cultural Properties: The ahupua’a of Honouliuli Has Been a Traditional Agricultural Property For 1000 Years) Refer to Figure 2: Ancient Hawaiian trail - Malden Maps, 1825.



FIGURE 2: An ancient Hawaiian trail was first mapped by Malden in 1825 (Source: Kalaeloa Heritage Park, ‘Ewa, O’ahu, Final Environmental Assessment, September 2014)

Post-Contact Cattle Ranching and Plantation Agriculture

During the period from 1850 to 1924, cattle ranching and plantation agriculture flourished on the Ewa Plain. Prior to the growth of the sugar industry, raising cattle for beef products was prevalent. The transition to the sugar industry era began in 1889. In 1890, the Oahu Railway and Land Company (OR&L) was the primary means for hauling cane and sugar. The first use of narrow-gauge railways was conducted by Ewa Plantation in 1902.

Towards the end of the nineteenth century, sisal plantations began to rival the Hawaiian sugar industry to produce bailing twine utilized in self-binding harvesters. One of the sisal plantations became a principal train station built along

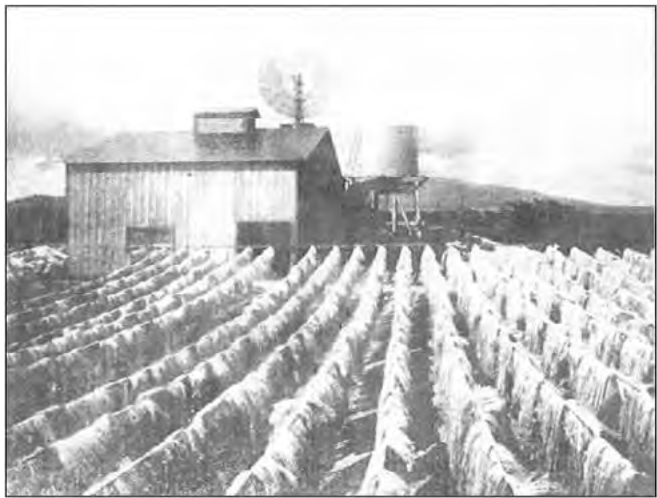


FIGURE 3: The mill at the sisal plantation - Sunday Advertiser, January 25, 1903 (Ewa Field Cultural Landscape Assessment Final Report, February 2016, U.S. Navy)

the OR&L line named the ‘Sisal Station’. These industries spurred the growth of sizable communities that included housing, healthcare facilities, schools, and retail businesses. (Ewa Field Cultural Landscape Assessment Final report, February 2016, U.S. Navy). Refer to FIGURE 3: The mill at the sisal plantation - Sunday Advertiser, January 25, 1903.

Military Presence in the Pacific

Military presence at Kalaeloa was driven by the establishment of the U.S. Navy Rigid Airship Program between 1919-1935. Ewa Field was established as the Ewa Field Mooring Mast in 1925 which consisted of a 160-foot-high single pole-type mooring mast sited at the center of a 3,000 by 3,000 square foot area. In 1939, Ewa Field Mooring Mast became Ewa Mooring Mast Field as a temporary training field for Marine aviators. At this time, it was attached to the Naval Air Station Barbers Point (NASBP).

After the cancellation of the airship program, Ewa Field was upgraded to an air station and on February 3, 1941, the Marine Corps Air Station Ewa (MCAS Ewa) was established. The Naval Air Station Barbers Point (NASBP) was completed and commissioned in 1942 to be the largest naval air station in the Pacific arena.

World War II

On December 7, 1941, the Ewa Field was the first site to be struck during Japan’s attack on Pearl Harbor sustaining serious damage and loss of life. The NASBP served as an important base of operation in the Pacific during WWII from 1941-1949.

MCAS Ewa closed in 1949 and reverted to Naval Air Station Barbers Point (NAS Barbers Point). NAS Barbers Point was formally closed as an active naval installation in July 1999. (Ewa Field Cultural Landscape Assessment Final Report, February 2016, U.S. Navy). Former Naval Air Station Barbers

Point (navy.mil) Refer to FIGURE 4: June 1942 Aerial of Ewa Mooring Mast Field (U.S. Navy).



FIGURE 4: June 1942 Aerial of Ewa Mooring Mast Field (U.S. Navy)

1.1.5 Respecting Kalaeloa’s Cultural Landscape and Hawaiian Sense of Place

In traditional Hawaiian beliefs, nature and culture are regarded as one, and all natural, physical, and spiritual universes are interrelated. This affinity forms the basis for the respect embracing both nature and humankind. The health of the environment is fundamental to the health of the population. Natural resources such as rock precipices, a small mound, stream of water, fauna, and native wildlife are respected as cultural properties. Perpetuating the “traditions of place” through oral histories are important to ensure that traditional cultural values are preserved and not forgotten. Although, Kalaeloa has experienced multiple changes over time, the absence of visible evidence does not discount the cultural landscape of ‘place’.

“Hawaiian history is a reflection of the belief that humans and their living environment share a familial relationship. By learning and becoming familiar with Moolelo Hawaii, one becomes aware of the cultural attachment Hawaiians have to their environment and begins to see that the Hawaiian landscape is a storied landscape and a living landscape. As we learn the histories and traditions of the land and make sure that these stories live on in our minds, we create a space where present and future generations are able to feel the cultural attachment to the land they inhabit.”

“Native Hawaiian Culture is grounded in the ina and the places in which traditions and customs are formed and practiced. In a very general sense, Hawaiian culture is a sense of place that comes with a deep attachment to the land itself and its many resources that is both ancestral and familial. The environment in which Native Hawaiians exist is living and imbued with the manifestations of gods and ancestors that make up the physical world around us. Hawaiian culture is therefore connected to ideas of sustainability, conservation, and preservation, in that the ina and the natural world must come first. Hawaiians believe in the manao, “He alii ka ina, he kau ke knaka” (the land is the chief and man is its servant). The idea of mlama ina (caring for the land) and aloha ina (love for the land) are integral to Hawaiian culture; a large part of being a steward to the ina is knowing the stories and the names of those places”. (Source: He Ala Mheuheu a n Hnauna, A Customary Path Traveled Over the Generations Phase I Interpretive Plan for the Honolulu Rail Transit Project, Honua Consulting).

The present and future development of Kalaeloa is grounded in this Hawaiian sense of place which requires deference for the traditions and values of its past eras.

1.1.6 Diverse Community

During the period of rapid growth of plantations, the demand for workers spurred the migration of laborers originating from a wide range of nationalities to Hawai’i. Laborer shortages compelled plantation owners to attract the needed work force by building housing, schools, and healthcare facilities. These formed communities which were regarded to be their homes rather than transient work camps. These villages became an element of the Hawaiian landscape. Kalaeloa evolved to become a diverse community possessing a shared heritage that was grounded and interpreted as a Hawaiian sense of place . (Source: He Ala Mheuheu a n Hnauna, A Customary Path Traveled Over the Generations Phase I Interpretive Plan for the Honolulu Rail Transit Project, Honua Consulting).

“Surrounding Renton Road were the residential villages the company provided for its plantation workers. Fernandez, Tenney and Varona are just some of the villages, each acting as its own cultural bubble. Abang grew up in “Korean Camp,” although she notes that most of her neighbors were Filipino immigrants, like her family.”

“Despite living in different clusters, the laborers often congregated on Renton Road. Abang recalls the way everyone would come together for public events, like their annual Christmas parade or town carnival. She says that Ewa Villages had everything you would need.” (Source: The Civil Beat, “Can the Rich History of Ewa Villages Spark a New Sense of Community?”, Ku’u Kauanoē, September 19, 2021).

1.1.7 Commemoration

The global events preceding, during and after WWII that took place at Kalaeloa resulted in profound impacts to its cultural landscape. The relationship to the environment then included an active battlefield. The bravery and patriotism that fueled each individual’s heroism became yet another connection to the land within the Hawaiian landscape.

“During the Korean War, it (Kalaeloa) was used as a critical staging area and would later become home to the Rainbow Fleet—a squadron used to track Soviet submarines. Today, the vestiges of early Hawaiian stacked coral dwellings and agricultural features, religious structures, modified sinkholes, and trail markers still exist. Traditional Hawaiian burials may also be present. In addition, 20th century habitation, ranching, and sisal cultivation sites are located alongside World War II military components.” (Source: Advisory Council on Historic Preservation, Kalaeloa Heritage Park, “Former Navy Base Preserves Native Hawaiian Heritage, Military History”). www.achp.gov/success-stories/kalaeloa-heritage-park

1.1.8 Interpretation of a Hawaiian Sense of Place at Kalaeloa

The Hawaiian sense of place at Kalaeloa may be expressed through these planning and design elements.

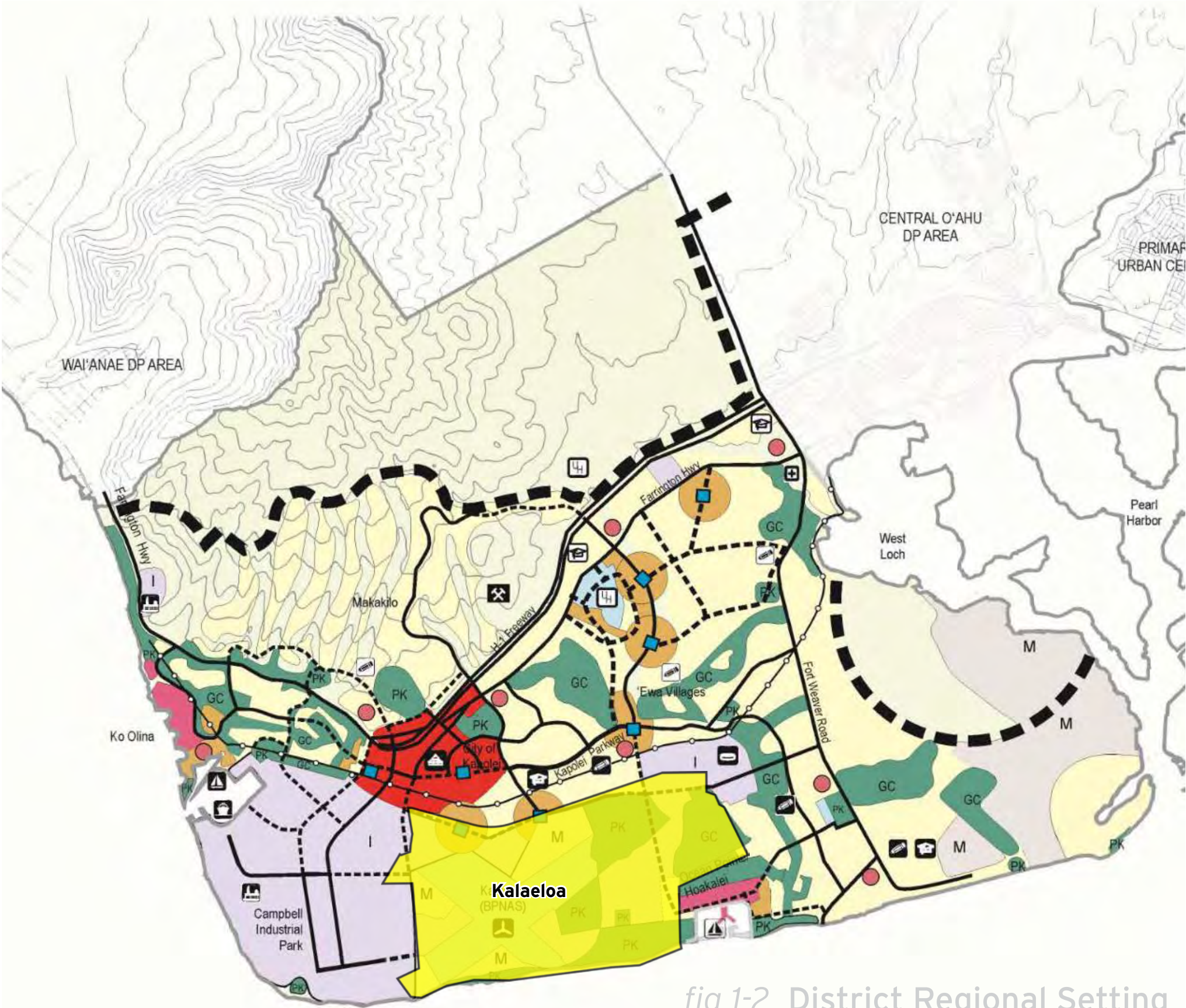
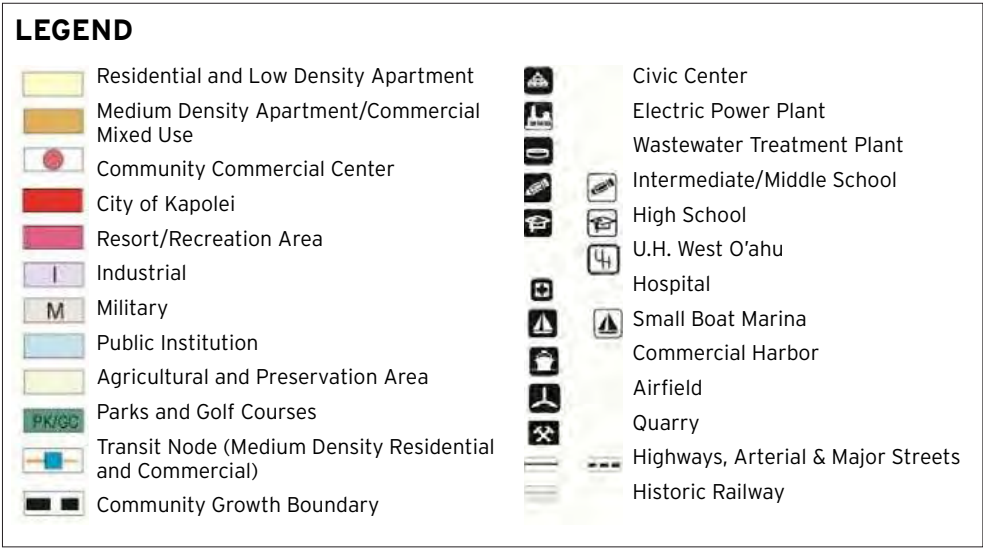
- ❖ Sense of Community
 - Social and cultural programs and activities
 - Promote awareness that the Kalaeloa community is unique and spiritually engaging through community-oriented educational activities
 - Activities that bring kupuna and keiki together
 - Support community workdays at the Kalaeloa Heritage Park
- ❖ Landscaping
 - Implement reforestation projects of native plants such as ‘ahinahina o ‘Ewa, koali’ai, kupala,’ and ilima.
 - Expand upon Kalaeloa Heritage Park’s relationship with the University of Hawaii West Oahu’s Botany program
 - Planting of native plants on residential properties and community facilities
 - Shade trees along smaller roads and bike paths to encourage walkability
- ❖ Environmental
 - Integrate solar power for lighting neighborhood paths
- ❖ Open Spaces
 - Integrate green spaces such as parks, athletic fields, and playgrounds throughout
 - Preserve natural features throughout the terrain
 - Integrate open, green spaces throughout townhouse groupings
- ❖ Architecture
 - Design community facilities to take advantage of natural ventilation

1.2 Existing Conditions



1.2.1 Regional Setting

Kalaeloa is situated within the 'Ewa plain on the island of O'ahu and is bounded by residential development to the north and east, and by Campbell Industrial Park to the west. Communities in the region, consisting of predominantly single-family residences, include Kapolei, Makakilo, Honokai Hale, 'Ewa Beach, 'Ewa by Gentry, 'Ewa Villages, Ocean Pointe, Hoakalei and others. Commercial areas, schools, and parks support these residential neighborhoods. The northeastern corner of Kalaeloa is adjacent to the City's Honouliuli Wastewater Treatment Plant. The State's Kalaeloa Deep Draft Harbor and Ko Olina Resort are located west of Campbell Industrial Park. The University of Hawai'i's West O'ahu campus is located north of Kalaeloa in east Kapolei. The nine-acre Wai Kai development in Hoakalei is being built adjacent to the southeastern boundary of Kalaeloa. (Refer to Figure 1-2)



SOURCE: 'Ewa Development Plan, City and County of Honolulu, July 2013

1.2.2 Land Ownership, Land Use, and Status of Conveyances

The conveyance and ownership of land in Kalaeloa has evolved over the course of the BRAC process and will continue to evolve. Government interest in land has fluctuated, with certain agencies withdrawing interest and others expressing interest. Federal legislation allows the Navy to sell or lease portions of its retained lands in support of redevelopment at Ford Island in Pearl Harbor. Land transferred pursuant to this legislation has since been sold to private entities. A description of each of the current and interested landowners is provided in the sections below. Some parcels are encumbered by covenants and stipulations that must be accommodated.

1.2.2.1 U.S. Government

1.2.2.1.a Navy

When the U.S. government designated NASBP for closure, the Navy retained approximately 1,055 acres for housing, recreation, operational and community support services. In April 2000, the Navy announced plans to fund development of its lands at Ford Island in Pearl Harbor. Special federal legislation (10 United States Code 2814, “Special Authority for the Development Ford Island, Hawai’i”) authorized the sale or lease of approximately 675 acres of Navy retained land in Kalaeloa. These so called, “brokered lands” included the majority of land along Roosevelt Avenue and in select parcels throughout the future downtown area. Navy retained lands that

are not part of the Ford Island development include the Barbers Point Golf Course and adjacent horse stables, White Plains Beach, Nimitz Beach, Landfill, Public Works Center, and Defense Reutilization and Marketing Office facilities.

1.2.2.1.b U.S. Coast Guard

The U.S. Coast Guard (USCG), based at Kalaeloa since 1949, is responsible for maritime and recreational boating safety, law enforcement, environmental protection, and homeland security. Search and rescue is a primary mission in Hawai’i and the Pacific region, including the Marianas, Caroline, and Marshall Islands. The 58-acre site at Kalaeloa accommodates maintenance facilities for the USCG’s C-130 transport aircraft and HH-65 helicopters.

1.2.2.1.c Federal Aviation Administration

The U.S. Federal Aviation Administration (FAA) received 18 acres of land for the location of two navigational aids. One instrument is an outer marker for Runway 08L at Daniel K. Inouye International Airport and the other is a nondirectional beacon that serves Kalaeloa Airport and Wheeler Army Airfield. Both aids are co-located in the center of the 18-acre parcel and surrounded by a 500-foot clear zone to protect the radio signals from the instruments.

1.2.2.1.d Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) received 37 acres in the southwestern portion of Kalaeloa for incorporation into the Pearl Harbor National Wildlife Refuge. This undeveloped parcel is situated between the end of the airport runway, the ocean, and the Campbell Industrial Park drainage channel and contains the endangered plant species *Achyranthes splendens var. rotundata*.

1.2.2.1.e Veterans Affairs

The U.S. Department of Veterans Affairs (VA) received two parcels of land that encompass an area of approximately seven acres. Through a lease agreement with U.S. Vets, Inc., three buildings on these sites have been renovated and are now providing housing and social services for veterans. A VA clinic is currently being constructed on a privately-held parcel in the northwestern area of the District.

1.2.2.1.f U.S. Postal Office

The U.S. Postal Service (USPS) received a one-acre parcel of land in the downtown area. The post office currently services the Kalaeloa area and is an alternative postal center for the Kapolei and ‘Ewa communities.

- NON - NAVY PROPERTY**
- AIRPORT
 - BOARD OF WATER SUPPLY
 - CAMPBELL DITCH
 - CITY ROAD
 - COAST GUARD
 - DEPARTMENT OF EDUCATION
 - DEPARTMENT OF HAWAIIAN HOMELANDS
 - DEPARTMENT OF HUMAN SERVICES
 - EAGLE RIVER INVESTORS HAWAII
 - FEDERAL AVIATION ADMINISTRATION
 - FORD ISLAND HOUSING (HUNT)
 - HAWAII COMMUNITY DEVELOPMENT AUTHORITY
 - HAWAII AIR NATIONAL GUARD/ US ARMY
 - HUNT DEVELOPMENT GROUP
 - KALAELOA WATER COMPANY
 - RP KAIMANA KALAELOA (BLACKSTONE)
 - STATE ROAD
 - US FISH AND WILDLIFE SERVICE
 - US POSTAL SERVICE
 - VETERANS ADMINISTRATION

- NAVY PROPERTY**
- NAVY OWNERSHIP
 - CITY PARK (PENDING TRANSFER)
 - HAWAII AIR NATIONAL GUARD/US ARMY (PENDING TRANSFER)
 - HUNT DEVELOPMENT GROUP (LEASE OR SALE)

- KALAELOA CDD BOUNDARY
- EWA PLAIN BATTLEFIELD NATIONAL REGISTRY BOUNDARY

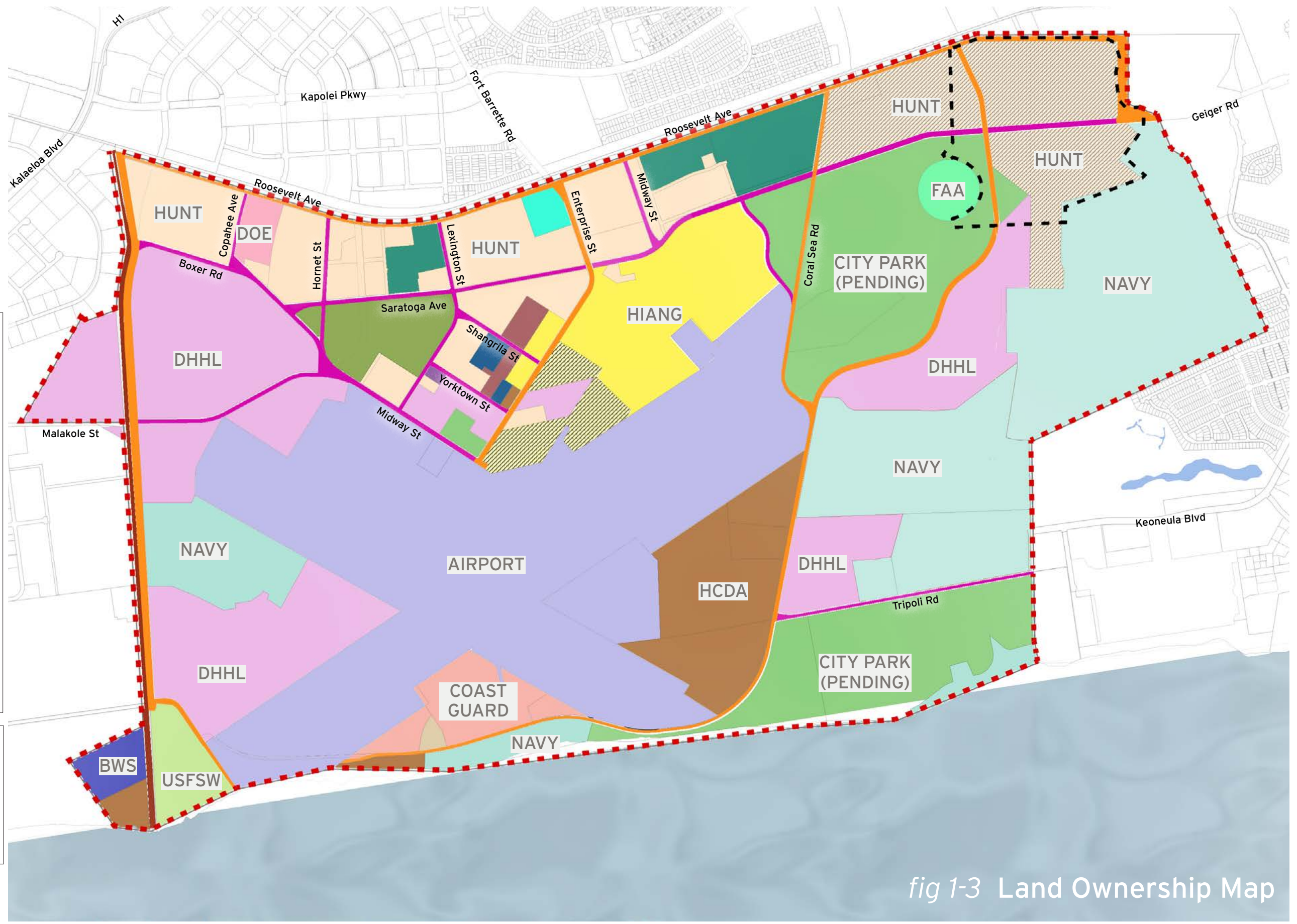


fig 1-3 Land Ownership Map

1.2.2.2 State of Hawai'i

**1.2.2.2.a Hawai'i National Guard—
Headquarters and Youth Challenge Hawai'i**

The Hawai'i National Guard received three parcels totaling approximately 148 acres. The 29th Separate Infantry Brigade is the largest unit in the Hawai'i Army National Guard. Units of the Separate Infantry Brigade at Kalaeloa include its Headquarters and Headquarters Company, the 229th Military Intelligence Company, and the 29th Support Battalion. The Hawai'i Air National Guard also has a presence at Kalaeloa as the 297th Air Traffic Control Squadron, operating the airport's air traffic control tower. In addition, the HNG Youth Challenge Program at Kalaeloa provides “at risk” teens a chance to earn their high school diplomas through a mentored, military-based education program.

1.2.2.2.b Department of Education - Barbers Point Elementary

The Barbers Point Elementary School was conveyed to the State Department of Education (DOE) under a public benefit conveyance as a part of the disposal of surplus land at Kalaeloa. The elementary school currently has approximately 535 students enrolled from kindergarten through sixth grade. The students are from Kalaeloa, Honokai Hale and Upper Makakilo areas.

1.2.2.2.c Department of Hawaiian Home Lands

Fourteen parcels totaling approximately 555 acres were part of a settlement agreement under the Hawaiian Home Lands Recovery Act (P.L. 1-4-42) conveyed to the Department of Hawaiian Home Lands (DHHL). These parcels, ranging in size from 1-130 acres, are located in three distinct areas: west of the airport, downtown, and east of the airport runways.

DHHL is currently leasing portions of these lands and appurtenant facilities to approximately 20 tenants for various commercial and industrial purposes.

1.2.2.2.d Hawai'i Housing Finance and Development Corporation

Pursuant to the McKinney Homeless Assistance Act (P.L.100-77), the predecessor of the Hawaiian Housing and Finance Development Corporation (HHFDC) received a conveyance of two parcels, totaling 12 acres, for homeless assistance services. These parcels contain four buildings that have since been renovated and leased to Holo Loaa to coordinate and provide housing services for people experiencing houselessness.

1.2.2.2.e Department of Transportation - Kalaeloa Airport

The Kalaeloa Airport, located on a 798-acre parcel in the center of Kalaeloa, has been conveyed to the State Department of Transportation (DOT) under a public benefit conveyance. The airport has two parallel runways (4R-22L and 4L-22R) and a crosswind runway (11-29). Runway 4R-22L is 8,000 feet; Runway 4L-22R is 4,500 feet; and Runway 11-29 is 6,000 feet. Retention of the crosswind runway benefits the local community by maximizing takeoffs and landings over water, thus reducing noise impacts. In addition, Runway 11-29 provides backup capability during periods when Runway 4R-22L is closed for maintenance. Kalaeloa Airport also includes a 100-acre ramp area that houses the air-traffic control tower and attached administration building, two large hangars, and two large aircraft parking aprons for use as tie-down space, future hangar expansion, and lease lots.

The designated use of the airport is to serve as a general aviation airport and reliever airfield for Daniel K. Inouye International Airport.

1.2.2.3 City and County of Honolulu

1.2.2.3.a Board of Water Supply - Reverse Osmosis Facility

The Honolulu Board of Water Supply (BWS) acquired 21 acres of land in the southwest corner of Kalaeloa through a public benefit conveyance for the purpose of developing a desalination plant to supplement O’ahu’s potable water supply. The BWS is currently preparing to issue a Request for Proposals for design-build-operate-maintain services for the project. An adjoining 10-acre parcel has also been identified for transfer to the BWS.

1.2.2.3.b Department of Parks & Recreation

During the BRAC process, the City expressed interest in receiving approximately 485 acres through a public benefit conveyance for the establishment of beach parks, community parks and a Pacific International Sports Complex. The park areas include one parcel in the downtown area, four parcels east of the airport runway and six parcels along the coastline. Conveyances of all of these parcels are pending. The Department of Parks & Recreation is currently under a licensing agreement with the Navy for two baseball parks and one beach park in Kalaeloa.

1.2.2.4 Private Entities

1.2.2.4.a HUNT Companies- On Station Housing

Hunt Companies currently has the fee interest in a 53-acre housing area in Kalaeloa, previously held by Ford Island Housing. This housing area, referred to as On-Station Housing, consists of 28 single-family residences and was the former officers’ housing area when NASBP was operational. Most of the residences are 50 years or older and many are currently without utility services. There are about 11 units that are being made available as market rentals.

1.2.2.4.b Blackstone Group (Kaimana Kalaeloa Owner) - Orion, Makai, and Orion Park Housing

In April 2016, Blackstone Group acquired the fee interest in three housing areas at Kalaeloa, including: Orion, Makai, and Orion Park. Orion encompasses a 13-acre site that contains 116 multi-family units. Makai covers a 43-acre parcel and contains 280 multi-family units. Orion Park housing is a 16-acre parcel and contains 120 multi-family units.

1.2.2.5 Unallocated Land

During the BRAC process, several government agencies withdrew their interest in receiving lands in Kalaeloa. The U.S. Fish and Wildlife Service (USFWS) withdrew interest in three of the four parcels it was designated to receive. These parcels, totaling approximately 200 acres, are relatively undeveloped and contain wetlands and habitat for endangered plant and bird species and archaeological sites. The HDOT-Airports and the University of Hawai’i have since expressed interest in each receiving a parcel, leaving the third and largest parcel (about 146 acres) unallocated.

Similar undeveloped parcels in the eastern portion of Kalaeloa, totaling 135 acres were previously designated for public benefit conveyance to the State Department of Land and Natural Resources (DLNR) to be used as a heritage park. However, the State later withdrew their interest. Two of the parcels were previously used by the Navy as skeet and trap ranges. As a result, the surface soils were heavily contaminated with lead and were subsequently removed and encapsulated in the Navy’s landfill parcel in the western portion of Kalaeloa. These parcels also contain numerous archaeological sites and features.

1.2.3 Existing Infrastructure

This section describes conditions of existing infrastructure and challenges to the development of Kalaeloa.

1.2.3.1 Streets

There are more than 20 miles of existing roadways at Kalaeloa in various states of repair, many lacking sidewalks. Through a Memorandum of Agreement (MOA) between the former Barbers Point Redevelopment Commission, the State DOT, and the City, the major roadways within Kalaeloa were transferred from the Navy as described in Figure 1-4. Some of these streets will form the backbone of the Master Plan amendment. In addition, the City of Honolulu has created a bicycle master plan, to which new bike routes in the Plan will connect.

LEGEND

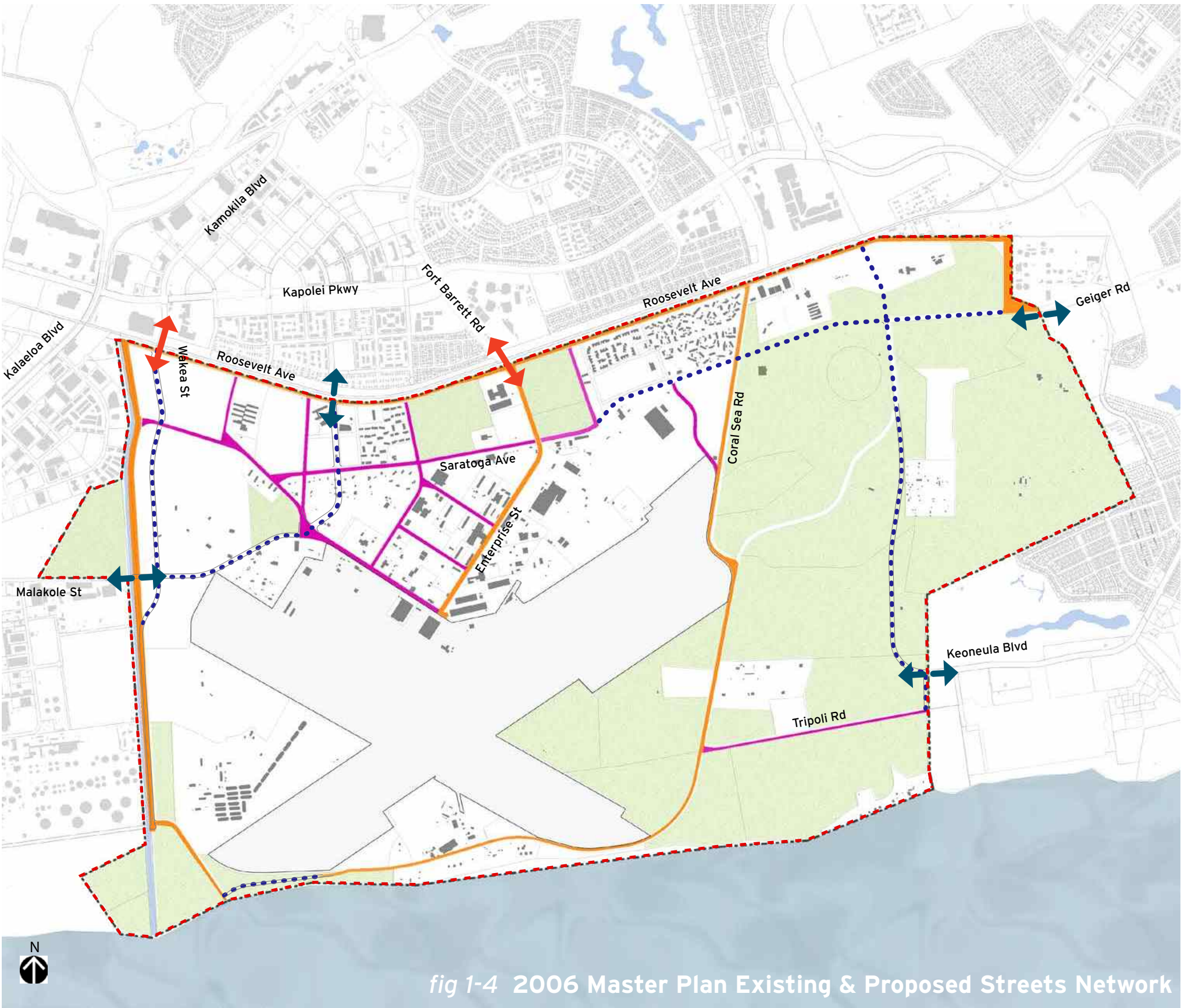
Existing City Road

Existing State Road

Existing Road Connection

Proposed Road (2006 Master Plan)

Proposed Road Connection (2006 Master Plan)



1.2.3.2 Public Transportation

Public transportation in the ‘Ewa region is primarily provided by the City’s “TheBus” system of fixed routes (trunk, local, and express), transit hubs, and the HandiVan special services. A transit hub to the north of Kalaeloa in Kapolei is connected by TheBus to the transit hub in ‘Ewa, with a limited number of transit stops along Roosevelt Avenue in Kalaeloa. The Honolulu Authority of Rapid Transit (HART) train line is under construction and has a terminus at Kualakai - East Kapolei, which is roughly 1.5 miles from the northern boundary of the District.

LEGEND

416 - Kapolei Circulator

413 - Campbell Industrial Park

94 - Villages of Kapolei - Express

44 - Waipahu-Ewa Beach

40 - Honolulu-Makaha

415 - Kapolei Transit Center

95 - Kapolei Homesteads

41 - Kapolei-Ewa Beach

Bus Stations

West Oahu / Farrington Hwy Section

Every 60 mins

Every 40 mins

Every 40 mins

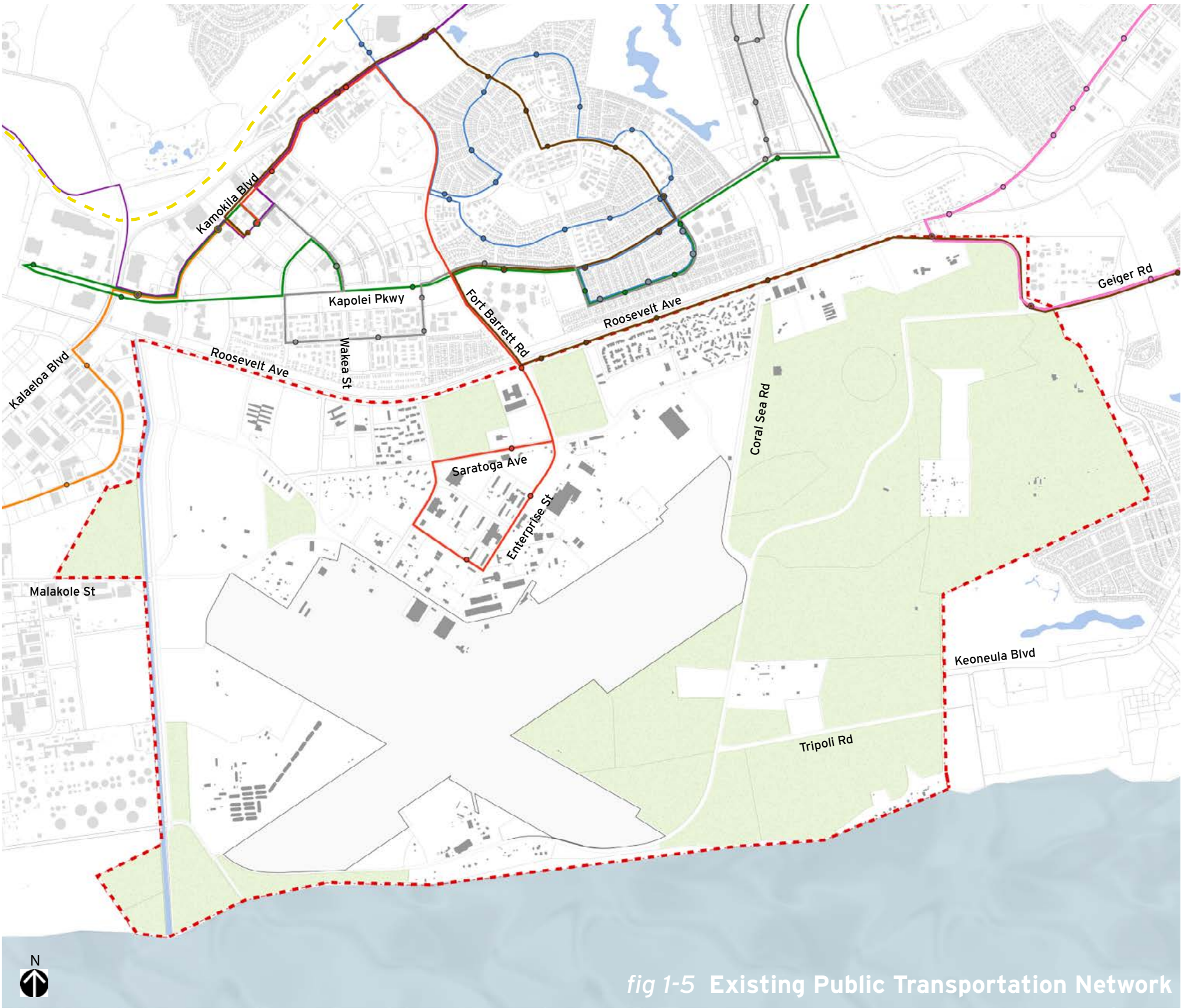
Every 60 mins













Every 35 mins

Weekdays 3-6 pm every 30 mins
Weekends every 60 mins

Only on weekdays 4-5 pm

Every 60 mins



| LEGEND | |
|---|---|
| <i>Existing & Proposed Bicycle Facilities</i> | |
|  |  Shared Use Path |
|  |  Bike Lane |
|  |  Shared Roadway |
|  |  Buffered Bike Lane |
|  |  Shoulder Bikeway |
|  |  Protected Bike Lane |



DRAFT

KALAELOA MASTER PLAN

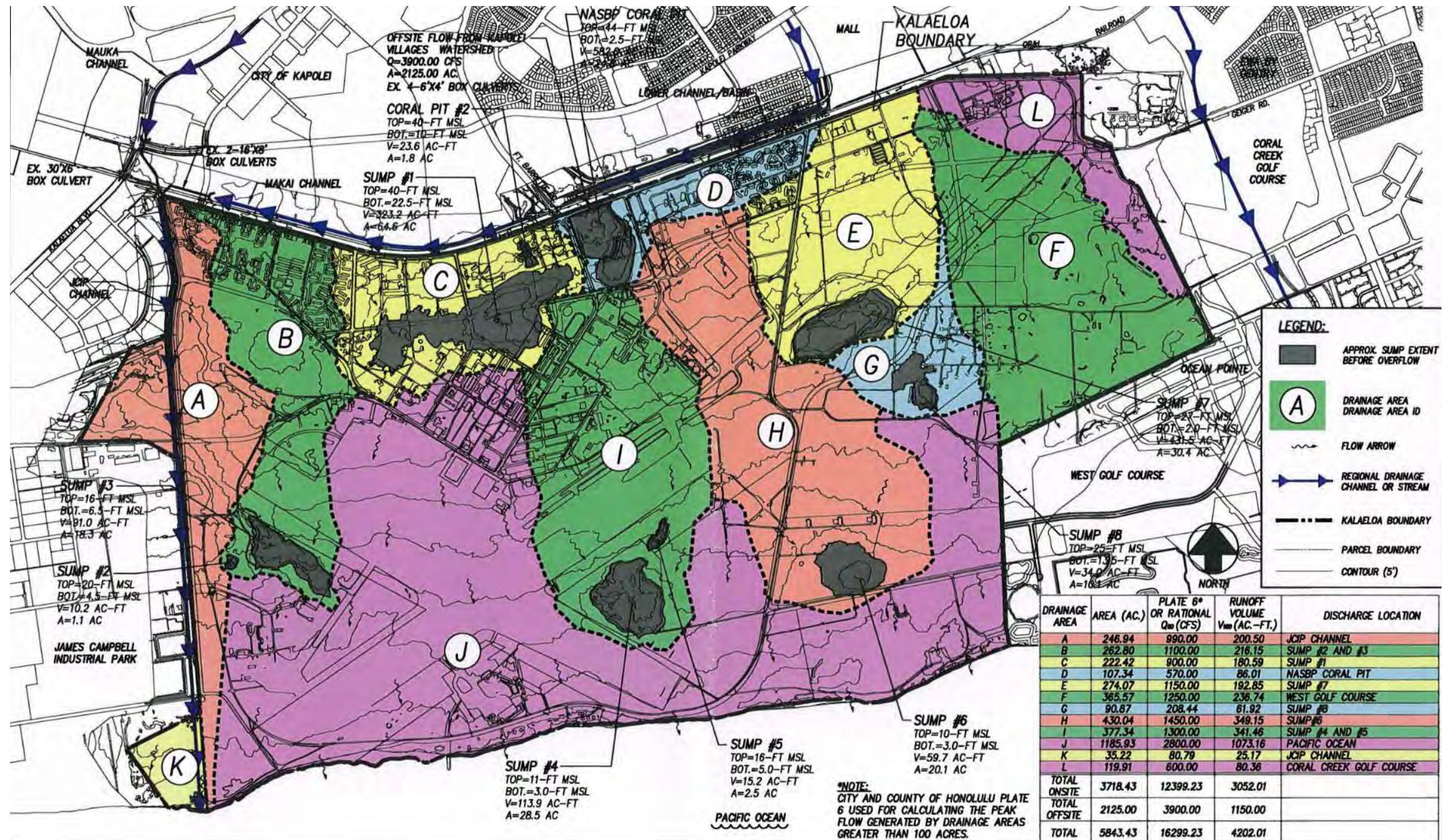
1.2.3.3 Drainage

In 2017, a Drainage Report was performed by R.M. Towill Corporation (RMTC) of Honolulu. Although a draft report, it remains the most thorough assessment that has been done in Kalaeloa to date. The information in this section is taken from that report.

Kalaeloa partially falls within the City of Kapolei watershed and Kaloi Gulch watershed. The lower limit of the Kapolei Village watershed is the NAS Barbers Point coral pit, located within Kalaeloa below Roosevelt Avenue on land owned by Hunt Development Corporation. This facility receives all excess runoff not retained in the watershed. Some of the runoff conveyed to this facility was accounted for and approved as the region developed, and some of the drainage is not. The regional watershed boundaries and the limits of Kalaeloa are illustrated in Figure 1-7. Previous development of Kalaeloa was mainly intended for the Navy's use and the existing drainage system and roadways were not constructed in accordance with State or City standards. The existing drainage system consists of 253 drywells that were located around Navy facilities and have been permitted by the State Department of Health (DOH), Safe Drinking Water Branch and Underground Injection Control (UIC) Program. The existing capacity of the drywells is unknown, and maintenance has not been done since the closure of the base in 1999, so they are assumed to be non-functional.

Runoff generated in Kalaeloa generally sheet flows across the site in the southern direction towards the ocean. The majority of onsite runoff flows to one of the ten (10) sumps in Kalaeloa and infiltrates into the ground. The NAS Barbers Point coral pit and existing sump #1 are able to hold runoff from the 100-year, 24-hour storm, but the other existing sumps overflow during 100-year, 24-hour storm.

In particular, existing sump numbers 2 - 6 and 8 do not have the capacity to retain the runoff volume generated by the 100-year storm event with a 24-hour recurrence interval. During a 100-year, 24-hour storm event, excess runoff will overflow from these sumps and sheet flow to the ocean. A portion of the Kalaeloa Airport and a light industrial area are located downstream of sump numbers 2 - 5; however, no adverse impacts from flooding were determined in previous drainage reports. The remainder of the onsite runoff flows to the NASBP coral pit, the James Campbell Industrial Park (JCIP) channel, the Coral Creek Golf Course, the Hoakalei Golf Course, or the Pacific Ocean.



SOURCE: Draft Kalaeloa Drainage Report, R.M. Towill Corporation, June 2017

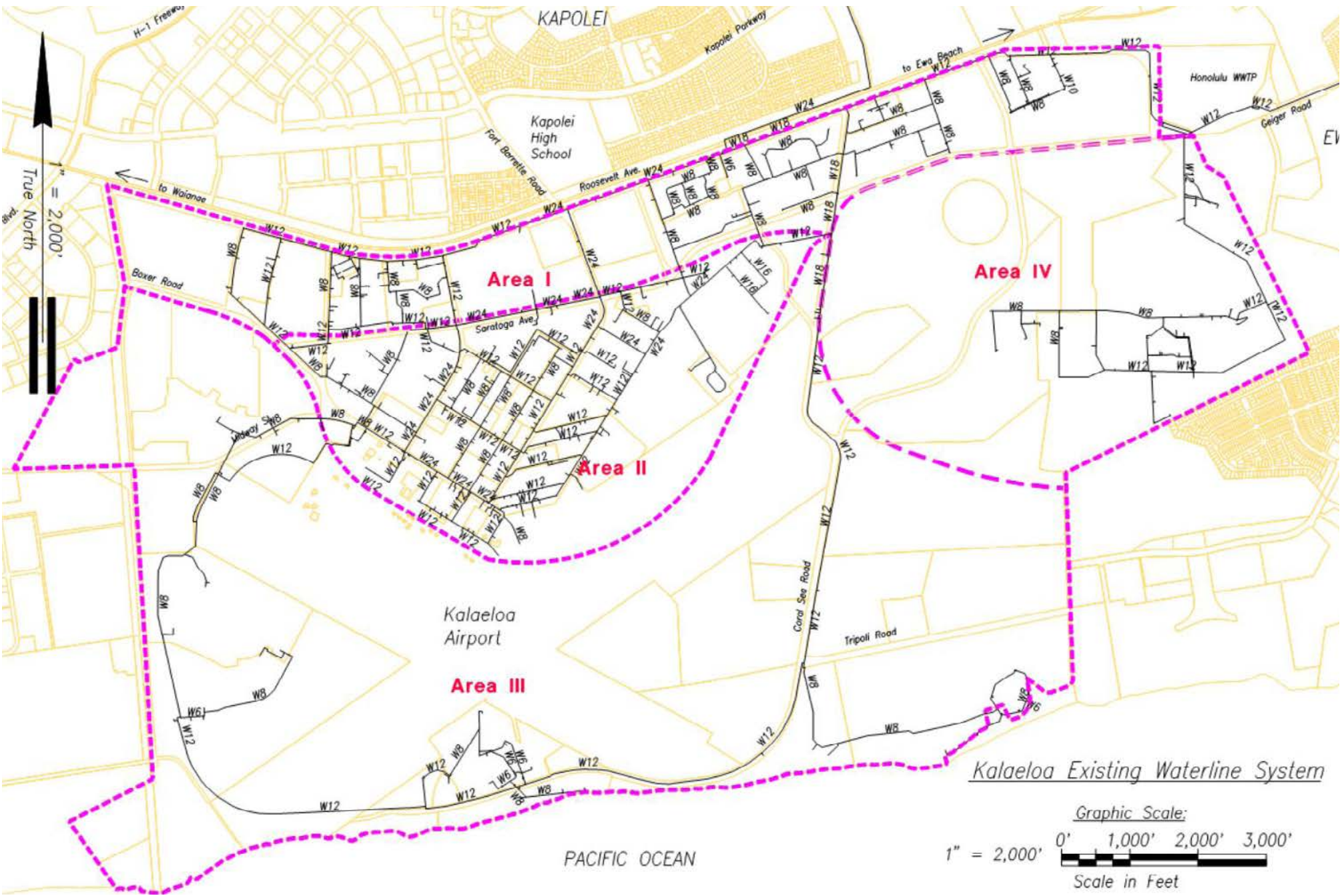
fig 1-7 Existing Drainage Network

1.2.3.4 Water Supply

In 2016, a draft Kalaeloa Potable Water Master Plan was prepared by RMTC. Although a draft report, it remains the most thorough assessment that has been done in Kalaeloa to date. Portions of that plan were used in the preparation of this section.

In 2020, ownership of Kalaeloa’s water system transferred to the Kalaeloa Water Company (KWC), a private water company and a subsidiary of CalWater. The majority of Kalaeloa’s water system is assumed to have been built in the early 1940s at about the time the NASBP was being established. The water system was constructed according to Navy design standards and does not comply with Honolulu Board of Water Supply (BWS) standards.

Water for Kalaeloa is provided by existing wells and reservoirs located 3 miles north of Kalaeloa. According to the 2015 data from the flowmeter at the wells, the estimated average daily flow is approximately 2.2 mgd. The water meter readings are closer to 1.0 mgd. Further investigation is underway to determine the cause of this discrepancy or location of system leakage. Most of the existing water demand is generated in the northern housing area, the downtown industrial area located north of Midway Street, and the golf course. Water from the two wells is conveyed by a 24-inch transmission main which terminates in a vault mauka of Roosevelt Avenue across from the northern housing area. From there, distribution is split and water to the northern housing area, golf course, Coast Guard and beach areas is from an 18-inch main and water to the



SOURCE: Draft Kalaeloa Potable Water Master Plan, R.M. Towill Corporation, June 2016

fig 1-8 Existing Water Supply Network

downtown, airport and western industrial areas and school is from a 24-inch main.

The Kalaeloa water system is also connected to the BWS transmission line on Fort Weaver Road. A pressure booster pump located on Geiger Road, at the southern perimeter of the Honouliuli Wastewater Treatment Plant (HWWTP), is operated when there is a need to use the BWS water source. The use of BWS water only occurs on emergencies.

Water to the downtown area and Kalaeloa Airport is distributed by a 24-inch waterline and a system of 12-inch and 8-inch distribution mains. Water to the eastern portion of Kalaeloa, Coast Guard and beach areas is from an 18-inch waterline with 12-inch and 8-inch distribution mains. Figure 1-8 shows the major water lines of the existing water system.

There are two reservoir sites each with one underground reservoir. One reservoir site includes the wells and the other site has only a reservoir. While each reservoir has a capacity of 1 mgd and are nearly identical in size, due to terrain of these sites the reservoirs were built with a 5-foot elevation difference. Each reservoir is 10-feet high. Therefore, with a 5-foot difference in elevation, one reservoir has only half of its capacity as the system is presently operated so that upper reservoir is only half full. The 24-inch transmission main connects the two reservoir sites along Farrington Highway. The main heads south along the eastern boundary of the Kapolei Golf Course and drainage channel until the southern end of the Villages of Kapolei. The main then runs along the old Renton

1.2.3.5 Non-Potable Water Supply

In 2017, a draft Kalaeloa Non-Potable Water Plan was prepared by RMTC of Honolulu. Although a draft report, it remains the most thorough assessment that has been done in Kalaeloa to date. Portions of that plan were used in the preparation of this section.

Non-potable water is typically for irrigation use and supplied in or described as “purple pipe” water. The Honolulu Board of Water Supply (BWS) entered into the water recycling business in 2000 by purchasing the Honouliuli Water Recycling Facility, also known as the BWS Water Reclamation Facility. Water recycling is one element of a broader BWS strategy to protect O’ahu’s aquifers and to conserve water resources through conservation and development of new water supplies. The facility is now irrigating golf courses that were once using brackish water, including West Loch, ‘Ewa Villages, Hawai’i Prince, and Coral Creek.

The reclamation facility currently has a capacity of 12 million gallons per day (mgd) and produces two grades of recycled water. R-1 water is used for irrigational uses, and Reverse Osmosis (RO) for industrial uses. The facility is currently capable of producing up to 10 mgd of R-1 water, which is the highest level of treatment as designated by the Hawai’i DOH for reuse. R-1 water is currently used throughout the state of Hawai’i for golf course irrigation, landscaping, and agriculture. This recycled water begins with secondary-treated effluent from the Honouliuli WWTP. RO is also produced at the facility

and is potable. R-2 is the grade of RO water that is distributed to JCIP.

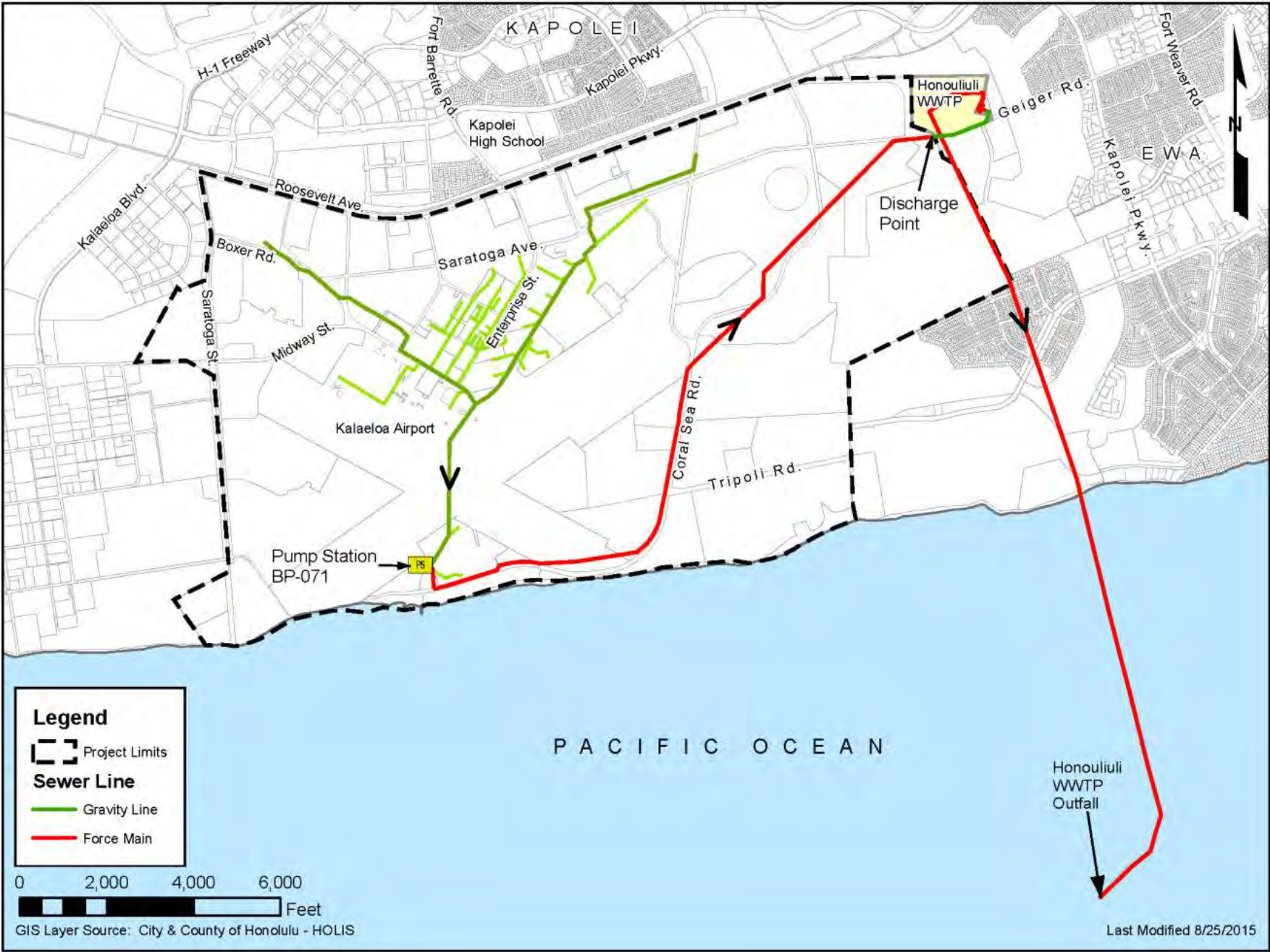
With an increase in potable water demand, the BWS encourages the use of R-1 water to conserve the groundwater. As a result of this, BWS is willing to meet the potable water demand if R-1 water is used. R-1 water is available along the northern boundary of Kalaeloa. However, use of such reclaimed water within Kalaeloa will require additional (dual) non-potable service lines to designated areas in Kalaeloa.

1.2.3.6 Sewer System

In 2016, a pre-final Kalaeloa Sewer Master Plan was prepared by RMTC of Honolulu. Although a draft report, it remains the most thorough assessment that has been done in Kalaeloa to date. The information in this section is taken from that report.

The majority of Kalaeloa’s sewer collection system is assumed to have been built in the early 1940s at about the time the NASBP was being established. The collection system was constructed according to Navy design standards and most likely does not comply with City standards. The wastewater collection system is currently owned and operated by Kalaeloa Water Company, a private entity. After taking ownership of the existing sewer system, KWC repaired some of the leaks that existed in 2016.

Most of the existing wastewater flows are generated in the northern housing areas and downtown industrial area, located north of Midway Street. Sewage from this area is collected into one of two main sewer lines along Midway Street before converging north of Kalaeloa Airport into a 30-inch gravity pipe which then conveys flows beneath the airport runways into the main near the southern shoreline. This station conveys sewer flows through a forced main along Coral Sea Road and subsequently discharges into the City’s sewer system on Roosevelt Avenue. Wastewater is treated at this facility and is either disposed of through the Barbers Point Ocean Outfall or conveyed to the BWS Water Reclamation Facility for further treatment and reuse.



SOURCE: Pre-Final Kalaeloa Sewer Master Plan, R.M. Towill Corporation, July 2016

fig 1-9 Existing Sewer Network

According to the Utility Systems Assessment Potable Water and Wastewater Systems NAS. Barbers Point by Fukunaga and Associates (1992), the present estimated average daily flow ranges from 0.4 to 0.7 mgd.

Figure 1-9 shows the major sewer lines of the existing gravity sewer system as well as the existing sewer system wastewater pump stations and flow mains.

Due to Kalaeloa’s flat terrain, there are several areas within Kalaeloa that require sewer pump stations (lift stations) for conveyance to the HLIWWTP. There are 12 existing pump stations in Kalaeloa.

These stations are the most significant components of the sewage system that are non-standard. All new pumping stations constructed in conjunction with implementation of the Master Plan will be required to meet City standards.

The RMTC analysis determined the modelled Navy gravity sewer lines (West, Central, and East gravity sewer lines) all have significant excess capacity at existing wastewater flows.

1.2.3.7 Electrical System

1.2.3.7.a Existing Distribution System

Most of the existing electrical distribution system in Kalaeloa is owned and operated by the Navy.

Community members in Kalaeloa have experienced extended and frequent power outages for the past decade. The five-year average SAIDI (System Average Interruption Duration Index - measuring expected outage time per year per customer) for Kalaeloa is 569 minutes. This is more than 5 times the national average of approximately 110 minutes (EIA). SAIFI (System Average Interruption Frequency Index - measuring expected number of outages per year per customer) also exceeds the national average of 1.0 with a current five-year average of 1.8. Poor performance in both indices is a result of minimal funding to maintain and upgrade the electrical distribution system following the closure of U.S. Naval Air Station Barbers Point. Though the base has closed, many military members and their families who still reside in Kalaeloa experience inadequate and inconsistent electrical service.

The Navy-owned system is served by three substations, which connect to the District near Roosevelt Avenue. The Navy is responsible for distribution and other ancillary services including billing. The distribution system for Kalaeloa is a combination of 12 kV and antiquated 4.16 kV circuits, both overhead and underground. Unfortunately, the Navy-owned dilapidated electrical system has been a barrier to redevelopment, private investment, and job development in Kalaeloa. The Navy no longer has an active mission in the District, and no longer has the funding to upgrade or maintain the system.

The HCDA is part of a stakeholder working group, which includes the Navy, Hawaiian Electric, Hunt Companies, NAVFAC Hawai’i, and the U.S. Coast Guard. The stakeholder working group aims to improve the electric system in the District and remove it from Navy ownership.

Since 2018, two 12-kV electric distribution corridors have been built to serve Kalaeloa. These are located at Enterprise Street and Coral Sea Road, and are built to electric system standards accepted by the main electric service provider for Oahu, Hawaiian Electric (HECO). HECO has, thus far, been unable to accept the existing on-site Navy system due to concerns regarding the condition and compliance of the infrastructure, and potential environmental liability associated with the system. HECO is the primary electrical utility provider on O’ahu, and any future electrical system at Kalaeloa will likely be an extension of HECO’s generation, transmission, and distribution grid.

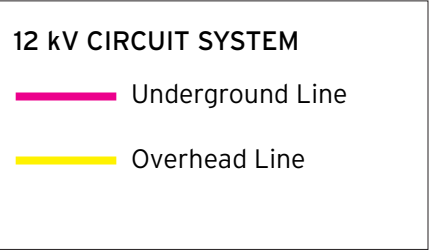
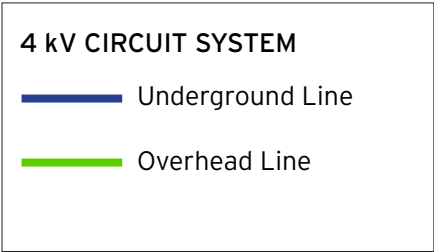


fig 1-10 Electric Distribution Systems
SOURCE: Electrical Distribution System Review
(Draft Final), C.H. Guernsey Co, April 2020

1.2.3.7.b On-Site Energy Generation

There are several solar generation facilities within Kalaeloa, see Figure 1-11. The newest is the 5MW Aloha Solar Energy Fund II (ASEF) solar facility, located at the southern end of Coral Sea Road. This generation facility is part of the 12 kV distribution upgrade connecting to the HECO network along Coral Sea Road.

The Kalaeloa Renewable Energy Park is a 5MW generation facility, on 20 acres, completed in 2013.

The Kalaeloa Solar Two is a 5MW generation facility on 36 acres of land leased from DHHL, completed in 2013.

EXISTING SOLAR PROJECTS

A

Kalaeloa Solar Two

B

Kalaeloa Renewable Energy Park

C

Aloha Solar Energy Fund

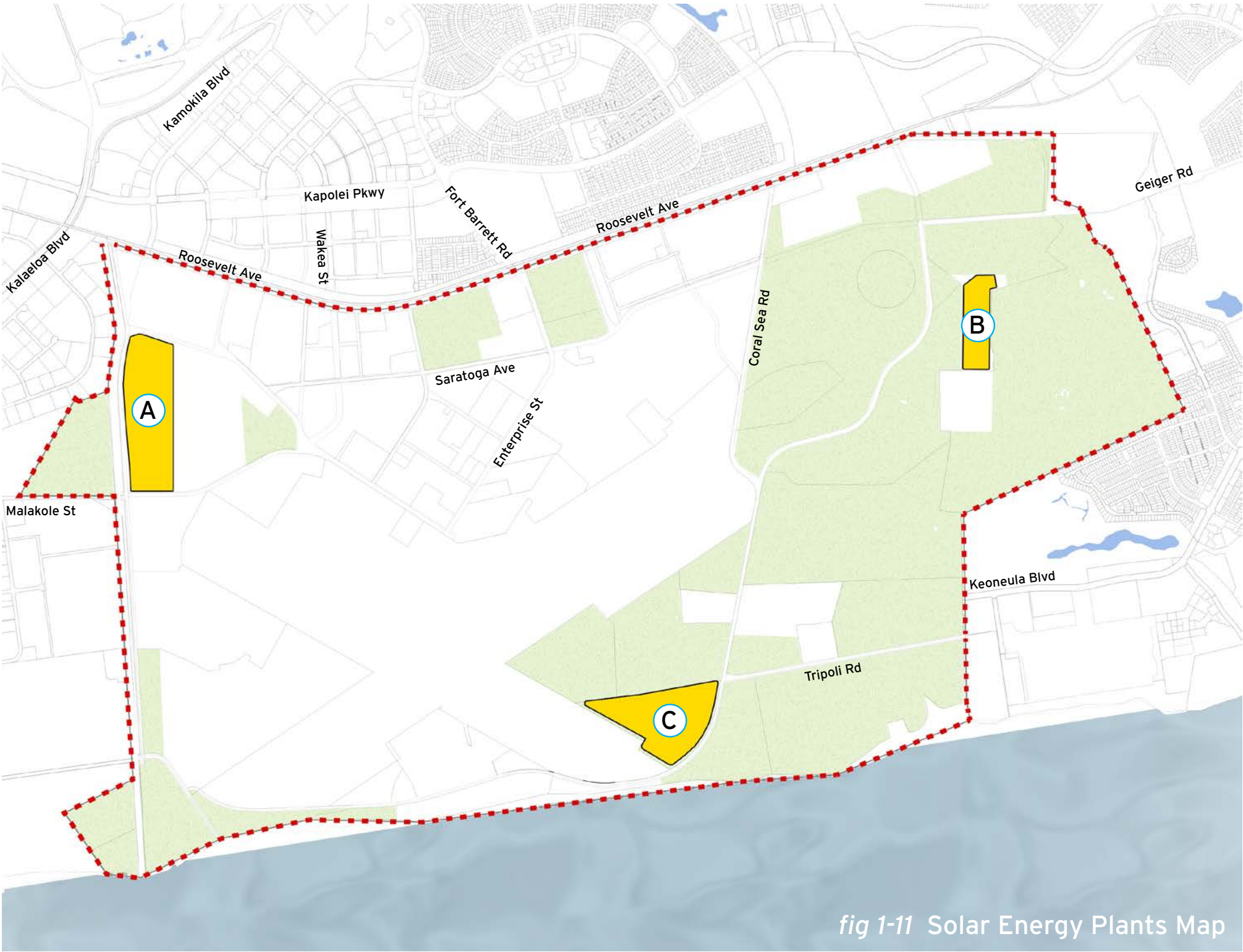


fig 1-11 Solar Energy Plants Map

1.2.3.8 Telecommunications

The telephone and communications cable system in Kalaeloa is currently owned by the Navy Computer and Telecommunications Area Master Station. Service is provided to Kalaeloa customers through an agreement with Hawaiian Telcom. Telecommunication service to all DHHL parcels is provided by Sandwich Isles Communication.

1.2.3.9 Airport Zoning

The Kalaeloa Airport and its operations greatly affect the feasibility of certain types of development in Kalaeloa. Runway Protection Zones (RPZs) and height restrictions along the path of aircraft landing and takeoff strips limit vertical development. The aircraft noise also limit types of uses within certain areas around the airport. See Figure 1-13 Airport Noise Map which illustrates airport noise exposure levels in Kalaeloa.

The FAA’s Compatible Land Use Task Force publishes the “Land Use Compatibility and Airports” guide. Information in this section is taken from that publication. The noise metric used in the development of the noise exposure contours is the Day-Night Average Sound Level (DNL). DNL is the required metric of the FAA and is the recognized industry standard.

Incompatible land uses around an airport can affect the safe and efficient operation of aircraft. Incompatible land uses can include wildlife-attracting land uses such as wetlands and landfills; cellular towers and antennae transmitting signals that interfere with radio transmissions and/or navigational aids; glare from solar energy photovoltaic panels; lights that may be disorienting to a pilot; and obstructions that may impact an airport’s airspace such as tall trees and structures including towers and construction cranes.

Within an airport’s noise impact areas, residential and public facilities such as schools, churches, public health facilities, and concert halls are sensitive to high noise levels. This can affect development. To assist in the assessment of noise compatibility/incompatibility in the airport area, a land use compatibility table has been developed (see Figure 1-12). Designations in this table, however, do not constitute a federal determination that any use of the land covered by this program is acceptable or unacceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses remain with the local authorities.

The land uses shown on Figure 1-12 are land uses that are compatible with airport operations. Most commercial and industrial uses, especially those associated with the airport, are appropriate adjacent land uses to airports. Land uses where the airport creates demand, such as motels, restaurants, warehouses, shipping agencies, aircraftrelated industries, and industries that benefit from the access to an airport, are compatible land uses.

| LEGEND | |
|---|---|
| Compatible | ✓ |
| Incompatible | X |
| Denotes potential mitigation measures or criteria for land use appropriateness. | |
| | * |

fig 1-12 DNL Land Use Compatibility Table
SOURCE: Table 8-5 Recommendations for Land Use Compatibility, HDOT-A

| Land Use | DNL | | | |
|---|-----|-------|-------|-------|
| | <60 | 60-65 | 65-70 | 70-75 |
| Residential | | | | |
| Low density residential, resorts, & hotels (w/outdoor facilities) | ✓* | X* | X | X |
| Low density apartment (w/moderate outdoor use) | ✓ | X* | X | X |
| High density apartment (w/limited outdoor use) | ✓ | X* | X* | X |
| Transient lodgings (w/limited outdoor use) | ✓ | X* | X* | X |
| Public Use | | | | |
| Schools, day care centers, libraries, & churches | ✓ | X* | X* | X* |
| Hospitals, nursing homes, clinics, & health facilities | ✓ | ✓* | ✓* | ✓* |
| Indoor auditoriums & concert halls | ✓* | ✓* | X | X |
| Government services & office buildings serving the public | ✓ | ✓ | ✓* | ✓* |
| Transportation & Parking | ✓ | ✓ | ✓* | ✓* |
| Commercial and Government Use | | | | |
| Offices: government, business, & professional | ✓ | ✓ | ✓* | ✓* |
| Wholesale & Retail: building materials, heavy equipment | ✓ | ✓ | ✓* | ✓* |
| Airport businesses: car rental, ticketing, lei stands, etc. | ✓ | ✓ | ✓* | ✓* |
| Retail trade, restaurants, shopping centers, financial institutions, etc. | ✓ | ✓ | ✓* | ✓* |
| Power plants, sewage treatment plants, & base yards | ✓ | ✓ | ✓* | ✓* |
| Studios w/o outdoor sets, broadcasting & production facilities | ✓* | ✓* | X | X |

| Land Use | DNL | | | |
|---|-----|-------|-------|-------|
| | <60 | 60-65 | 65-70 | 70-75 |
| Manufacturing, Production and Storage | | | | |
| Manufacturing, general | ✓ | ✓ | ✓* | ✓* |
| Photographic & optical | ✓ | ✓ | ✓* | ✓* |
| Agricultural (except livestock) & forestry | ✓ | ✓* | ✓* | ✓* |
| Livestock farming & breeding | ✓ | ✓* | ✓* | ✗ |
| Mining & fishing, resource production & extraction | ✓ | ✓ | ✓ | ✓ |
| Recreational Use | | | | |
| Outdoor sports arenas & spectator sports | ✓ | ✓* | ✓* | ✗ |
| Outdoor music halls, amphitheaters | ✓* | ✗ | ✗ | ✗ |
| Nature exhibits & zoos, neighborhood parks | ✓ | ✓ | ✓ | ✗ |
| Amusements, theme parks, & active playgrounds | ✓ | ✓ | ✓ | ✓ |
| Public golf courses, riding stables, cemeteries, gardens, etc. | ✓ | ✓ | ✗ | ✗ |
| Professional/resort sports facilities, media event facilities | ✓* | ✗ | ✗ | ✗ |
| Extensive natural wildlife & recreation areas | ✓* | ✗ | ✗ | ✗ |
| LEGEND | | | | |
| Compatible | ✓ | | | |
| Incompatible | ✗ | | | |
| Denotes potential mitigation measures or criteria for land use appropriateness. | * | | | |

fig 1-12 DNL Land Use Compatibility Table
(continued)



fig 1-13 Airport Noise Map

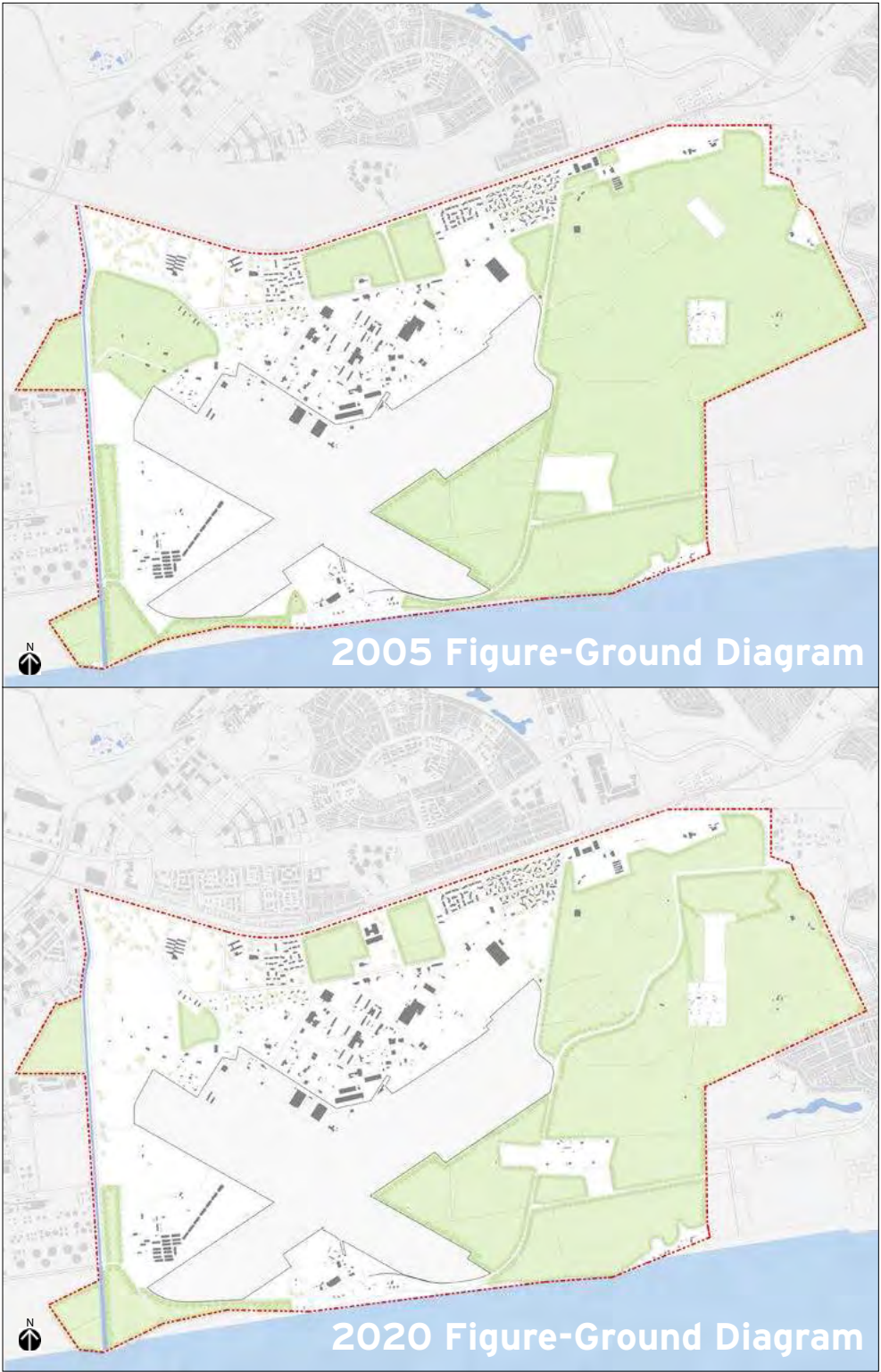
SOURCE: JRF 2020 Noise Exposure Map, Alternative 17, HDOT-A, November 1998

1.2.4 Existing Structures

Figure Ground diagrams are drawings that illustrate the relationship between the built and the unbuilt environment within the study area. Land coverage of buildings is visualized as grey solid mass (figure), while public spaces formed by streets, parks and plazas are represented as voids (ground). These diagrams, see Figure 1-14, are used to explore built form patterns and the continuity of open space.

The relative lack of development in Kalaeloa since the adoption of the 2006 Master Plan as illustrated in these diagrams taken from 2005 and 2020 is due to many factors, primarily: the various military uses onsite, inadequate infrastructure, and airport land-use considerations. Neighboring areas, namely Kapolei to the north and Hoakalei to the east have seen significant development compared to anything in Kalaeloa proper. The 2020 plan illustrates the “grain” and scale of that new development. The most significant new development within Kalaeloa has been the Field Office for the FBI which was meant to serve as a gateway and catalyst for new construction in the area. The Kalaeloa airport runways are still in use, limiting the area for residential redevelopment primarily to the area mauka of the runways.

fig 1-14 Figure Ground Diagrams



Kalaeloa already provides certain amenities that should be built upon to develop a more equitable, livable, and locals-serving community. Community assets within Kalaeloa proper include:

Employment Centers & Opportunities

- FBI Hawai’i Field Office
- Hawai’i Army National Guard
- Kalaeloa Airport - Aviation Industry Employment Opportunity
- Veterans Affairs Clinic Employment Opportunity
- Kalaeloa Professional Center

Cultural & Historical Assets

- Kalaeloa Heritage Park
- Historic Railway System
- ‘Ewa Plain Battlefield
- Ordy Pond
- Historic Buildings/Adaptive Reuse
- Officer Homes
- Wakea Garden Apartments
- American Renaissance Academy Building
- Kalaeloa Airport

Contextual Assets

- White Plains Beach
- Eisenhower Beach
- Nimitz Beach
- Large Shade Trees - pedestrian amenity
- Barbers Point Bowling Alley



EXISTING SITE ASSETS

- A Kalaeloa Airport
- B Kalaeloa Solar Two (PV Solar Plant)
- C Barbers Point Elementary School
- D Wakea Garden Apartments
- E DreamHouse Charter School
- F Ulu Ae Learning Center
- G Kaimana Housing Subdivision
- H Naval Officers Homes
- I US Post Office
- J Kalaeloa Professional Center/ Warrior Ohana Medical Clinic
- K Barbers Point Bowling Center
- L FBI Hawai'i Field Office
- M Pointer Baseball Fields
- N Hawai'i Air National Guard
- O Mehana Housing Subdivision
- P Pride Baseball Fields
- Q Historic 'Ewa Plain Battlefield Area
- R Kalaeloa Renewable Energy Project (PV Solar Plant)
- S Navy Barbers Point Golf Course
- T Kalaeloa Heritage Park
- U Ordy Pond
- V White Plains Beach
- W Kalaeloa Beach Park at Eisenhower Beach
- X Aloha Solar Energy Fund (PV Solar Plant)
- Y Nimitz Beach

fig 1-15 Site Assets

1.2.5 Physical Environment

1.2.5.1 Topography and Soil

Kalaeloa is relatively flat, with an average slope across the site of about 0.5 percent. The ground surface slopes gently southward from a maximum elevation of approximately 65 feet above mean sea level at the northern boundary to mean sea level at the shoreline.

Soil cover across nearly the entire site consists of a thin layer of friable, red material present in cracks and crevices on coral outcrop. Mamala stony silty clay loam is found along the northern, western, and eastern boundaries. This soil type is moderately permeable, with slight to modern erosion potential. Beach sand is found along the south shore, and the airfields are situated on filled land.

The geology and soils of the coastal plain area of the ‘Ewa district of O’ahu, including Kalaeloa, consist of limestone and limestone-derived “coral” soils. The coral and limestone were created when sea levels were as much as 250 feet higher than present day elevations. Coral reefs developed in these coastal ocean areas and much of the coral deposits were transformed to limestone through natural geologic processes.

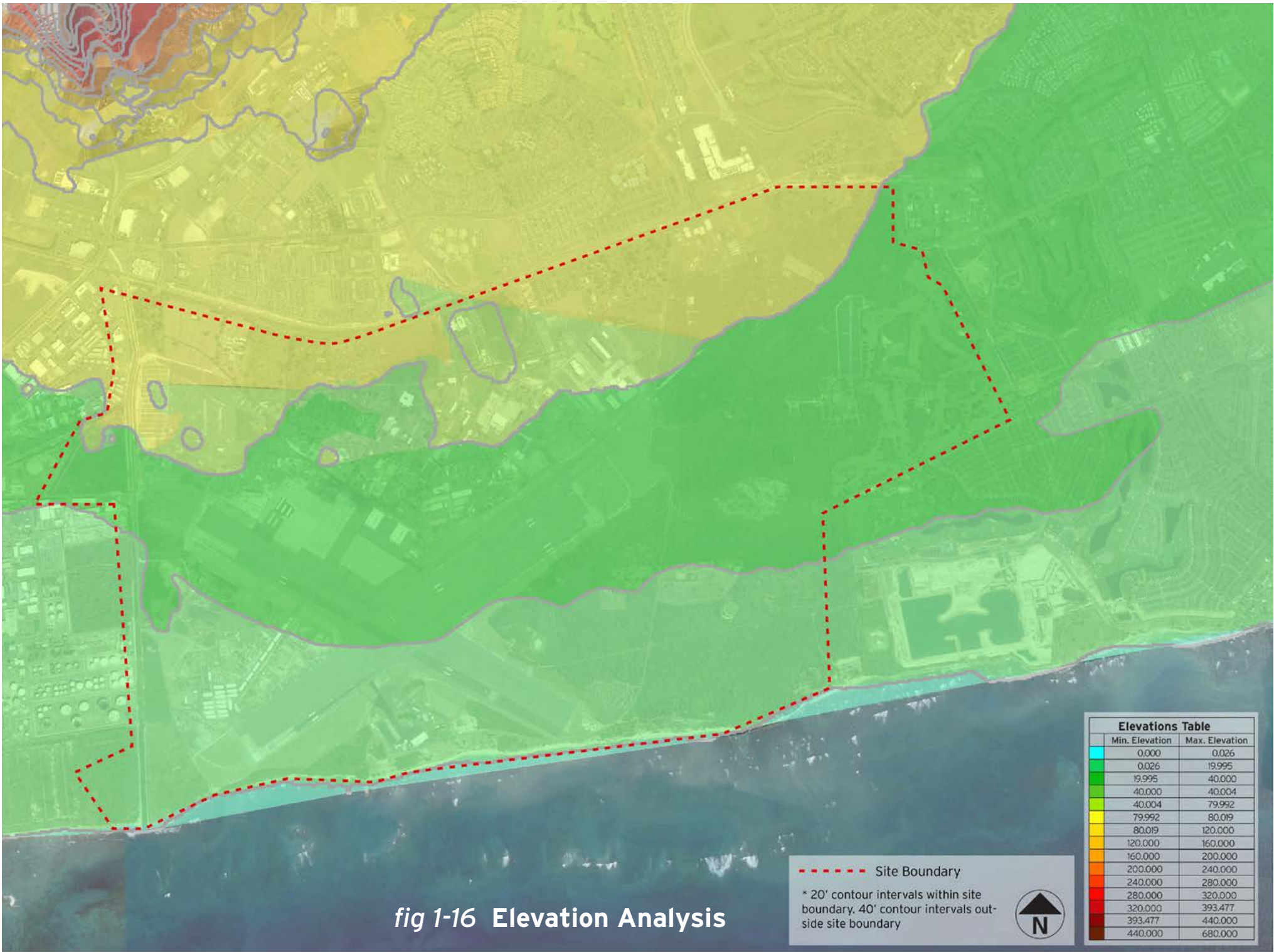


fig 1-16 Elevation Analysis

1.2.5.2 Flood Hazards

Per the Federal Emergency Management Agency’s 2011 Flood Insurance Rate Maps (FIRM), the shoreline at Kalaeloa along with the canal at the southwestern edge of the site are the only areas within a Special Flood Zone Area. The developable areas of Kalaeloa have not been determined to be within flood zones.

The vast majority of the developable area in the District is in the tsunami “Safe Zone.” The southern half of the District, most of which is not suitable for mixed-use development, is in the “Extreme Tsunami Evacuation Zone” while the Kalealoea shoreline and Campbell ditch are in the “Tsunami Evacuation Zone.”

LEGEND

Special Flood Hazard Areas

Floodway Areas in Zone AE

1% Annual Chance Floodplain Boundary

(EL #)

Base Flood Elevation Value, where uniform within zone

~123~

Base Flood Elevation Line and Value



1.2.5.3 Climate

The climate of the region is constant and relatively dry. Long-term climatic data at Kalaeloa indicate mean daily maximum and minimum temperatures of 81 and 69 degree Fahrenheit, respectively; mean annual rainfall of 20.3 inches on the ‘Ewa Plain with slightly higher figures for the upland area; and prevailing winds from the northeast at 9 knots. Also, solar insolation data for Kalaeloa shows that the area produces approximately 1,800 BTUs per square foot or 5.8 peak sun hours, making it among the highest in the state for solar potential; any locale that receives 4 peak sun hours or more is considered a good site to produce useful amounts of solar energy.

1.2.5.4 Ground Water

The groundwater under Barbers Point is within aquifers that are part of the ‘Ewa aquifer system of the Pearl Harbor aquifer sector. A confined aquifer in a deep layer of basalt, as well as a shallow unconfined aquifer in the overlying caprock, is present under Kalaeloa.

This groundwater in the confined aquifer is brackish with a chloride content ranging from 250 to 1,000 milligrams per liter and considered too deep to be contaminated from the surface. According to the Federal Safe Drinking Water Act, this aquifer qualifies as a source of drinking water. The State, however, has a more stringent standard for salinity and does not consider this aquifer a source for potable water use.

The shallow aquifer at Kalaeloa is brackish with chloride content ranging from 1,000 to 5,000 milligrams per liter; the water is not suitable for consumption or irrigation without desalination. This aquifer is at approximately 50 feet below ground surface along the northern boundary and at sea level along the shoreline. The aquifer is susceptible to contamination and no production wells have been developed.

1.2.5.5 Protected Species and Habitat

Two federally-listed endangered plant species exist at Kalaeloa. The endemic ‘akoko shrub (*Chamaesyce skottsbergii* var. *skottsbergii*) occurs in at least three separate locations, including the area east of the airfield. A single colony of endemic round-leafed chaff-flower shrubs (*Achyranthes splendens* var. *rotundata*) is found at the southwest corner of Kalaeloa. In addition, pua pilo (*Capparis sandwichiana* var. *zoharyi*), an endemic shrub federally listed as a species of concern, is known to exist in the same area as the *Achyranthes splendens* var. *rotundata*.

Ordy Pond, an anchialine pond east of the airfield, the coastal salt flats between Runway 4R-22L and Taxiway K, as well as the western boundary of Kalaeloa are frequented by the federally listed endangered Hawaiian black-necked stilt (*Himantopus mexicanus knudseni*) and migratory bird species. The state-listed endangered Hawaiian short-eared owl (*Asio flammeus sandwichensis*), federally listed as a species of concern, may occur or range over Kalaeloa.

The threatened green sea turtle (*Chelonia mydas*) is known to frequent the area immediately offshore of Kalaeloa.

1.2.6 Regional Economy

Provided in the sections below is a summary of a regional economic analysis that details: (a) historical trends that have shaped the ‘Ewa region; (b) market trends to assist in projecting demand for particular land uses that could be located at Kalaeloa; and (c) long-term trends associated with the growth of the island and regional economy that can create demand for new products and activities.

1.2.6.1 Population

Prior to closure of the O‘ahu Sugar Company in the early 1990s, much of the ‘Ewa region was dedicated to sugar cane cultivation. During the 1990s, the cane fields yielded to newly constructed homes. Much new development occurred east of Kalaeloa along Fort Weaver Road.

As the ‘Ewa region is developed into a new urban center, it is the location on O‘ahu most likely to accommodate population growth. Of the approximately one million residents expected on O‘ahu by 2035 about 15 percent are expected to live in the ‘Ewa region. The City’s ‘Ewa Development Plan contemplates a resident population in the year 2035 to be almost 165,000.

1.2.6.2 Housing

Surveys suggest that about a third of ‘Ewa’s adult residents work in the region. The low rate of in-region commuting is to be expected since most ‘Ewa residential areas were recently built. However, over time, more residents will find work nearby if jobs relocate to the region with workers.

In the early 1990s, the State strongly supported the idea of mixed-income communities, planning the Villages of Kapolei to accommodate families with incomes ranging from 80 percent of the County median household income and above. Affordable housing regulations ensure that developers are building housing for sale to moderate income households. Very little rental housing is being built. Housing surveys show growing demand from households earning 50 to 80 percent of the median income.

1.2.6.3 Employment

In 2000, about 15,000 jobs were located in the ‘Ewa region. Employment has largely been in the industrial, commercial, and retail sectors. Campbell Industrial Park is O‘ahu’s leading industrial area, and the nearby Kapolei Business Park is also attracting buyers of largely custom-built industrial and commercial properties. Retail areas in the center of Kapolei have been largely built out. The City’s ‘Ewa Development Plan estimates employment within ‘Ewa to rise to over 87,000 in 2035.

1.2.6.4 Economic Forecast

O‘ahu planners and political leaders have long intended Kapolei to become a second major city on the island. Plans for regional development have emphasized diversity of uses, including residential, commercial, and industrial space, along with key public facilities. Planning for the City of Kapolei has emphasized a “garden city” ambiance, with open promenades surrounded by mid-rise development.

To date, however, office and commercial buildings have been built in isolation, surrounded by parking lots, and residential areas consist largely of detached single-family homes. Several new projects currently being planned and developed in the ‘Ewa region may help provide the catalyst for higher density urban development, including:

- Residential, commercial, and civic development at Kapolei;
- Additional residential development along Fort Weaver Road and in the central ‘Ewa region;
- Large residential projects at Makaiwa Hills and West Kapolei;
- Hotel, timeshare, and attractions development at Ko Olina; and
- Development of the University of Hawai‘i West O‘ahu campus and the DHHL parcels along the Kualaka‘i Parkway corridor. Both of these are likely to include housing and large-lot commercial spaces.

Therefore, while the island of O‘ahu as a whole is anticipated to have stable and consistent economic growth over the next few decades, the ‘Ewa region is likely to see growth equal to, or greater than, the rest of the island. Residential, commercial, and industrial growth will be focused in the ‘Ewa region.

1.3 Stakeholder Engagement

1.3.1 Site Visit and Charrette

Originally envisioned as a five-day charrette for the project team to meet onsite with local stakeholders and members of the public to talk story and collaborate, the bulk of the community engagement and design workshopping had to be adapted due to the COVID-19 pandemic. Instead, the project team conducted a two and a half day charrette in Kalaeloa, at the Barbers Point Bowling Center and the Kalaeloa Professional Center, from June 29th to July 1st, 2021 to discuss and propose ideas for development. Tours of the site and neighboring communities allowed the project team to experience the local context and assess the feasibility of the master plan goals.

Given the world-wide health emergency, there were few opportunities to collaborate in-person. Regardless, the project team was committed to a robust community engagement process. Through virtual meetings with the community and stakeholders, the team received valuable input that would help shape how the team thought about the site and influence the design of it.

1.3.2 Community Meetings

A public virtual presentation in July 2021 provided an overview of the site, analysis, program, and an introduction to the design and development teams. Break-out sessions enabled community members to learn more information and discuss the strengths, shortcomings, wants and needs for development in Kalaeloa. Community feedback focused on housing affordability, open space access, and neighborhood identity. Participants emphasized a need for residential development that is economically accessible to existing residents. They highlighted the need for recreational opportunities such as parks and beach access. Community members also spoke of a desire for Kalaeloa to reflect the existing character of the area, including its cultural, natural, and military histories, as well as their values such as family-oriented neighborhoods and communal responsibility.

1.3.3 Kalaeloa Permitted Interaction Group

Include future meetings when applicable and results of the “P.I. Group Report” here.

1.3.4 Stakeholder Meetings

Engagement with local stakeholders began before the charrette and has continued throughout the process. Meetings with local agencies, landowners, and interested parties have informed and guided the focus for the master plan updates. Talk stories were a part of the stakeholder outreach to better understand Kalaeloa’s valued resources and to learn more about the issues and concerns of the community. Communication with the following interested stakeholders is ongoing.

1.3.4.1 Public Entities

1.3.4.1.a FBI Honolulu Field Office

A government-leased property, the FBI Field Office was intended to be a catalytic gateway project for future development in Kalaeloa. Right-sized infrastructure and a multi-modal transportation network for the benefit of their employees were particularly identified.

1.3.4.1.b Hawai’i Army National Guard

Major military construction projects are currently in the pipeline for the National Guard to increase capacity and readiness. There is no messhall on site to serve the large employee population; better connectivity and access to the surrounding area would be mutually beneficial.

1.3.4.1.c Department of Hawaiian Home Lands

DHHL holds a sizeable amount of land in Kalaeloa, the majority of which is designated as “Industrial.” Current uses consist of revenue-producing short-term leases (storage, solar projects) since existing inadequate infrastructure deems residential development untenable at this time.

1.3.4.1.d Honolulu Board of Water Supply

Kalaeloa is currently served by a privately run company, the Kalaeloa Water Company. BWS is currently not interested in acquiring it due to the poor condition of the system and significant water loss. A desalinization plant is planned in the area to be operational within 20 years.

1.3.4.1.e Kalaeloa - Department of Transportation

Kalaeloa Airport currently serves the military, the private sector, recreational users, and the University of Hawai’i. The airport is a potential asset for future development, but currently has an out-of-date Master Plan and no prospective strategy for significant reactivation.

1.3.4.1.f Hawai’i Authority of Rapid Transportation (HART)

Given the proposed route’s timeline for construction and alignment infeasibility, a specific route for the HART extension into Kalaeloa cannot be decided upon at this time. Regardless, a pedestrian-friendly environment would bolster future transit developments.

1.3.4.1.g Honolulu Fire Department (HFD)

The HFD has no station at Kalaeloa at present, but will require one in the future. The department has identified what it considers an ideal site, adjacent to the FBI facility, which would provide land for a new station, classrooms, storage, and a large training facility.

1.3.4.1.h Barbers Point Elementary School

The majority of the student body is at or below the poverty line. The school has a capacity for 700 students, but the facility is outdated and in need of refurbishment. The development of safe pedestrian and bike routes to and from the school would greatly benefit the students, as there are currently few sidewalks and no streetlights.

1.3.4.1.i Dreamhouse Academy Public Charter School

Dreamhouse Academy opened in its current location in July 2020. The school currently leases a building, but is looking to expand enrollment to 700 students by 2025. Parks, public spaces, and community-serving resources would greatly improve Kalaeloa for those already living and playing in the area.

1.3.4.1.j Kapolei High School

Although Kapolei High School is located outside the CDD, it remains an important local stakeholder in planning for Kalaeloa. The school is currently over capacity at 2,000 students. New residential development should consider funding impacts on nearby schools. Publically-accessible open spaces and community services should be incorporated into Kalaeloa’s future.

1.3.4.2.b Hunt Companies Hawai’i

Hunt owns the majority of developable land in Kalaeloa and frequently produces planning studies to guide development on their parcels. Hunt’s insights and community comments from previous outreach efforts has helped inform this Master Plan amendment.

1.3.4.2.c Ka Makana Alii Shopping Center

Ka Makana Alii Shopping Center is located across the street from the Plan area with expansion plans to develop along Roosevelt Avenue. Egress and ingress issues are a top concern given the historic railroad easement and the status of the Kualakai Parkway extension.

1.3.4.4 Community Members

Future uses and potential development must look at what is needed versus what is wanted. It needs to be mindful of the impacts on natural resources and the environment. Long-term planning should consider whether there are sufficient local government resources. Current uses in Kalaeloa seem to be mostly for recreation. Walkable, open market and retail spaces can help support small, local businesses. There is a need for retail and warehouse spaces for small local businesses, and this need should be taken into account for future uses in Kalaeloa.

Solar farm land use in Kalaeloa and other renewable energy sources are very important for the island, as is local food security. There are opportunities to better incorporate cultural and agricultural uses in Kalaeloa.

There are many cultural and historical sites throughout Kalaeloa, especially on the ‘Ewa-end. The areas with the most sensitive sites identified are along Coral Sea Road. Kualakai Trail was a historic mauka to makai trail, and it was well used into the 1920s. One major concern expressed is that archaeological studies from the 1960s and earlier are not comprehensive in their review of cultural or sensitive sites. Once this information is gathered, potential uses can be reviewed for suitability. Kalaeloa was known as a great place for marine resources, body boarding, and surfing.

1.3.4.3 Neighborhood Boards

Development concerns center around traffic and infrastructure capacity. Roadways, utilities, and public spaces should be appropriately designed to meet the needs of proposed development. Housing typologies should also be carefully considered.

Zoning and overlapping federal, state, and local jurisdictions complicate development in Kalaeloa. Along with community outreach and participation, proper land use management needs to be a priority in the development of the area.

1.3.4.2 Private Entities

1.3.4.2.a Hawaiian Electric Company (HECO)
The electrical grid in Kalaeloa is owned by the Navy, run by a subcontractor, and powered by a HECO substation. HECO is interested in acquiring ownership of the grid. Climate-change-induced sea level rise is not projected to affect existing electrical infrastructure.



2

CHAPTER 2 KALAELOA VISION

2.0 Kalaeloa Vision

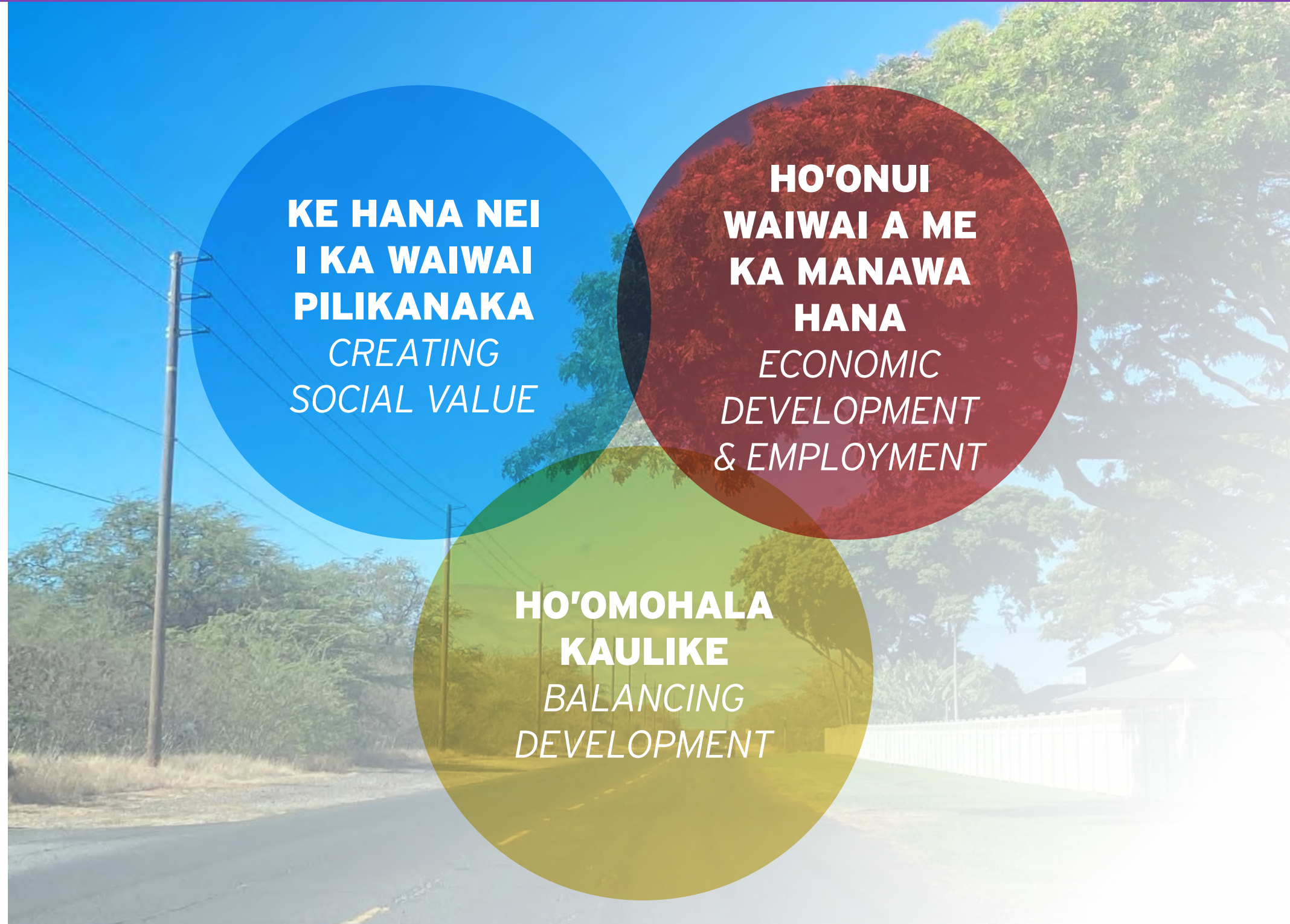
2.1 Creating Social Value

2.2 Economic Development & Employment Opportunities

2.3 Balancing Development - 20 Minute City

The vision for Kalaeloa as a center for excellence, as first articulated in the 2006 Master Plan and refined in this amendment according to stakeholder and community input, provides the context for developing the regulating plan discussed in Chapter 3. The sections below present an overview of the major opportunities at Kalaeloa, including:

- Creating social value;
- Providing new economic development and employment opportunities;
- Balancing development with addressing regional traffic congestion and protecting open space, and cultural and natural resources.



2.0 Kalaeloa Vision

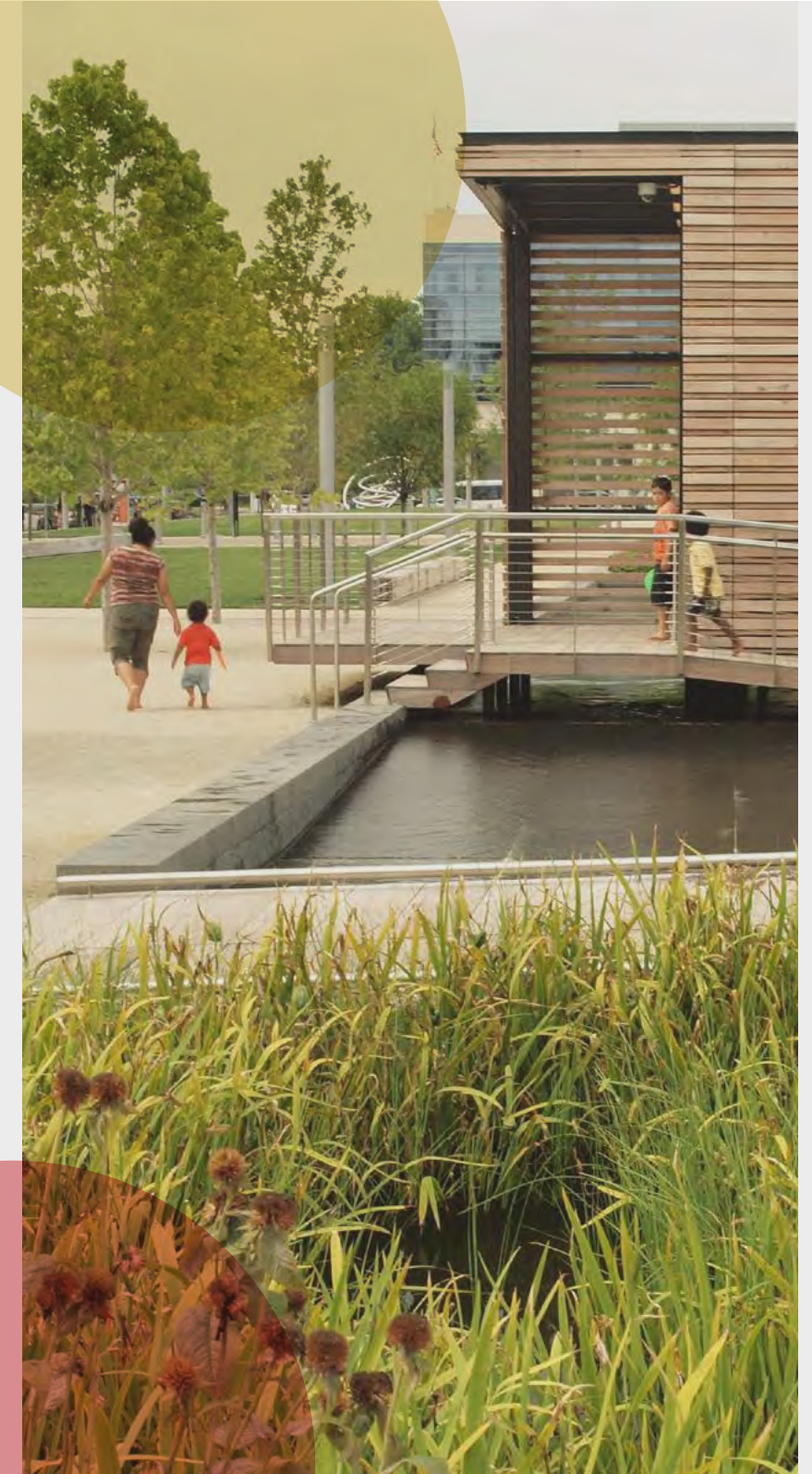
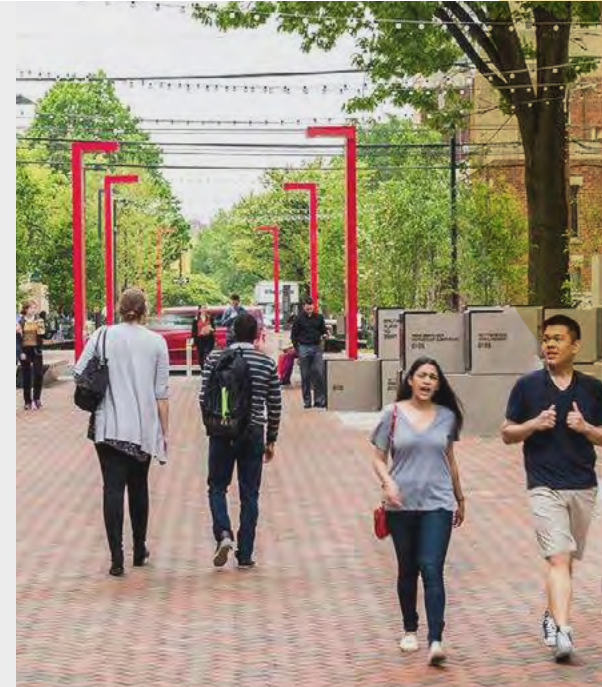
Kalaeloa is a Wahi Hookela (Center for Excellence) within the 'Ewa region.

Kalaeloa is a community where Hawai'i's people gather to share cultural knowledge and develop technical expertise, investing in a bright future while faithfully protecting the living history of O'ahu.

This is an independent, but highly accessible Center, providing for the health of its residents and newcomers through resilient infrastructure, the careful stewardship of water resources, renewable resource technologies, affordable homes, and local food security.

This is a place of restored natural environment and generational connection to the Earth - utilizing, preserving, and enjoying the resources of the land and sea.

Through the pursuit of excellence in all aspects of living, Kalaeloa is a model for achievement and self-sufficiency to surrounding communities and beyond.



2.1 Creating Social Value

Quality of life is vital to a community. Although defined on a variety of levels based on an individual's or family's needs, quality of life is often reflected in housing, education, recreation, accessibility, and open space, among others. A community that supports a high quality of life creates social value. Kalaeloa presents an opportunity to do this for residents in the 'Ewa region.

Consistent with the City's vision for a new urban center in the 'Ewa region, Kalaeloa is uniquely situated to create a model sustainable urban environment where the community can live, work, learn, play, and remember. This can be achieved through planning that accommodates and locates appropriate land uses, as described below:

- Creating housing with an affordable component in mixed-use neighborhoods that include home offices, live-work, and commercial spaces, built at densities that can support and increase ridership on the City's planned buildout of its public transit system and reflect market realities;
- Developing new housing with multi-modal connectivity and family-friendly amenities, such as low-speed streets with tree-lined sidewalks, and parks at various scales (with a child's playground no greater than an 1/8th of a mile away from every home);

- Designating new school facilities that are embedded in neighborhoods with safe routes to serve the needs of Kalaeloa families. Collaboration with the DOE will ensure that students have access to appropriate educational opportunities to thrive.
- Establishing a network of open space and recreation facilities that can connect the community and provide access to the shoreline and cultural and natural resources. Included in this network is a major regional park, whose function is both recreational and restorative;
- Celebrating Kalaeloa's rich history through planning that acknowledges the District's history and provides contextual continuity for posterity - in particular with the 'Ewa Plain Battlefield and the expansion of the Kalaeloa Heritage Park into a native hawaiian cultural center per previous proposals.



2.2 Economic Development & Employment Opportunities

Kalaeloa, given its amount of developable land, functioning airfield and location within the ‘Ewa region, presents several opportunities for new economic development in addition to other commercial, retail, and office activities. These include aviation related industries, alternative energy production, and technology research and development.

2.2.1 Aviation-Related Industries

In its current capacity, the Kalaeloa Airport is relatively limited in its ability to support aircraft operations. Although the potential exists for expanding airport operations to include other uses such as commuter or air cargo operations, they are currently outside the scope of HDOT-Airports Master Plan for Kalaeloa. Infrastructure and amenity upgrades are necessary to spur further development and activity at Kalaeloa Airport.

2.2.2 Technology Research and Development

Technology research and development in Kalaeloa offers the potential to diversify Hawai‘i’s economy, create educational opportunities, and offer quality, high paying jobs for area residents. Kalaeloa’s unique location, airfield, and available land can support technology sectors such as alternative energy, biotechnology, aquaculture, nutraceuticals, digital media, remote sensing, hyperspectral imaging, homeland security, and military research, among others. Realization of these industries, however, requires close coordination and partnerships with other government agencies, the University of Hawai‘i, and technology development corporations.

Of particular note is the development of restorative systems and procedures that replenish and revitalize the local flora and fauna to combat the manmade environmental degradation of the landscape and the adjacent ocean resources. This should include:

- Comprehensive approach to managing rainwater to replenish the aquifer and to help restore the native limu (a food staple of indigenous populations);
- Restoration of native coral colonies;
- Re-establishment of appropriate agricultural production in designated areas to allow growth of such native species as breadfruit and malina;
- Partnerships with organizations already practicing similar efforts in Hawai‘i would provide Kalaeloa with the capacity to flourish in the years to come.

2.2.3 Infrastructure

In order to unlock the opportunities of the District, Kalaeloa must have the supporting infrastructure necessary for the Plan’s realization, including a connected network of “complete streets,” transit opportunities, and reliable utilities such as water, electricity, and internet.



Kalaeloa NZE Community

A New Prototype for Hawai'i Community Development

Prepared by:
Van Meter Williams Pollack LLP
National Renewable Energy Laboratory

GREEN FEATURES

- ✿ Natural ventilation & daylighting
- ✿ Shading of exterior windows & walls
- ✿ Higher degree of building insulation
- ✿ Roof shading with photovoltaic panels
- ✿ Light exterior colors
- ✿ No HVAC systems
- ✿ Energy star appliances
- ✿ Rain screen exterior systems
- ✿ Modular & panelized construction techniques
- ✿ Roof-mounted photovoltaic systems
- ✿ Roof-mounted solar hot water systems
- ✿ Rain water reuse system
- ✿ On-site waste treatment facility



The Kalaeloa NZE Community is designed to be a holistic approach to healthy living through environmental awareness. It is a compact, 18-acre, 389 dwelling unit, mixed-use community that integrates sustainability at every level. This affordable and workforce housing community will sustain a net zero approach to energy, wastewater, and stormwater. All energy used on-site will be generated on-site with rooftop PV panels. Stormwater is harnessed and filtered completely on-site. A natural wastewater treatment facility is wonderfully integrated into the site design and layout. Local food production is an important highlight, with “steward farms” and edible landscapes located throughout the site. Additionally, an Aquaponics Center is featured, where fresh vegetables and fish are grown in a greenhouse setting. Compost and recycling facilities are located throughout the community and each resident will be educated on what materials can be put in each waste stream. The neighborhood will mix various housing types (stacked flats, townhouses, and carriage houses) in 2- and 3-story structures with a mix of 1- to 4-bedroom dwelling units. A mixed-use community “hub” is located in the center of the neighborhood, incorporating commercial spaces, an environmental center, a community center, post office, and public plaza.

2.2.4 Alternative Energy or Ecologically Sustainable Development

Given the continued escalation in fossil fuel environmental impacts, interest in renewable energy resources is increasing. The large tracts of flat, undeveloped land located near HECO’s transmission network at Campbell Industrial Park, and the relatively arid climate and proximity to the ocean, offer the potential for alternative energy development or industries aimed at reducing Hawai’i’s dependence on fossil fuels. Industries such as solar or hybrid energy generation, bio-mass conversion, bio- filtration, seawater cooling or other such technologies have development potential in Kalaeloa. Currently, there are three solar farms in Kalaeloa, generating a combined total of over 15 megawatts with the potential for more throughout the region. While these are horizontal applications that require significant land area, vertically-mounted photovoltaic systems should also be considered for compact sites and land conservation.

In 2012, HDCA funded the design of a new prototype for community development, “Kalaeloa NZE Community,” that embraced energy efficient systems and sustainable practices. This conceptual study was prepared by Van Meter Williams Pollack in partnership with National Renewable Energy Laboratory (NREL). It envisioned a Net Zero community that is compact, affordable, and sustains a net zero approach to energy, wastewater, and stormwater management. Lessons learned through this study should serve as a model for new development in Kalaeloa.

ECONOMIC
DEVELOPMENT
& EMPLOYMENT
OPPORTUNITY

2.3 Balancing Development - the 20-Minute City

The City of Honolulu, in its ‘Ewa Development Plan, envisions the creation of a new urban center situated in Kapolei as a “garden city” of walkable streets and open promenades that will provide jobs, housing, and services for residents in the ‘Ewa region. To this end, the Kalaeloa Master Plan adds the concept of the “20-minute city”, essentially the geographic scale that allows most human needs and many desires to be located within a travel distance of 20 minutes. In the 20-minute city, automobiles are accommodated but do not determine its scale or urban form.

The HCDA has planning jurisdiction in Kalaeloa and has established land use entitlements, coordinated with land owners, and considered the possible relocation of various land uses within the District to improve the balance of land uses in the ‘Ewa region in a manner that supports a new urban environment. With this coordinated planning authority and in collaboration with state and local entities tasked with employing sustainable and equitable policies, achieving many of the goals of the 20-minute city (defined by its ability to provide access to all human needs by walking or bicycling for 20 minutes or less) is achievable.

Why the “20-Minute City?”

The 20-minute city is the key concept that will help Kalaeloa become a Center for Excellence by:

1. Placing emphasis on what people love about cities: their vibrant streets and neighborhoods, and their convenience. Shorter commutes mean more time for recreation and family, and more money saved.
2. Improving the quality of life and promoting equality and diversity by enhancing accessibility to services.
3. Fostering healthy lifestyles by encouraging human-powered transportation, such as biking and walking, which have proven health benefits. The 20-minute city enhances walkability which results in fewer pedestrian and vehicular fatalities and can also help alleviate loneliness by making it easier to meet and interact with neighbors.
4. Relying on less pollution-emitting and less carbon-intensive forms of mobility, which have proven environmental benefits. A sprawling city is very energy intensive whereas a 20-minute city thrives on local and accessible transportation options.

Cities as disparate as Portland, Oregon and Melbourne, Australia have already been working on “20-minute neighborhoods” that employ these very concepts. And in recent years, the market has been sending a clear signal: homes in walkable neighborhoods are at a premium. Smart Growth, a U.S. advocacy group, argues this indicates that there is not nearly enough supply. 20-minute cities produce livable, equitable, healthier and environmentally-friendly benefits - all befitting a *Center for Excellence*.

2.3.1 The 20-Minute City

Achieving the 20-minute city has several positive implications:

- It is socioeconomically equitable—those without a car could easily access all their needs.
- The area is small enough that measuring diversity, in balance, produces a useful indicator.
- The need for transportation is reduced and therefore there is a reduction in traffic congestion and a reduction in fuel, which in turn mitigates global warming.
- Human-powered transportation that improves health and well-being is promoted, such as biking. The benefits are greater than one compact neighborhood alone could provide.
- The convenient location of services, accessible by multiple modes, saves time and improves quality of life.

The 20-minute city implies three levels of catchment areas or “sheds.” Within each of these sheds, a gross density of at least eight living spaces per acre may be assumed, including open space, civic facilities, and a variety of housing such as single homes, townhouses, and multifamily.



A 20-minute walk shed, three-quarters of a mile from center to edge, is the maximum distance that most people are likely to walk. Within this shed there will be a full mix of uses, including a grocery store, pharmacy, general merchandise, and public or charter schools. A large park space serving multiple neighborhoods will be found here, in addition to larger employers including the already extant FBI facility and the soon to be completed VA Clinic. The 20-minute walk shed includes access to the proposed extension of the HART system at several locations. This pedestrian shed is similar in size to a 5-minute bicycle shed, and the bicycle can be used to transport purchased goods.



The 20-minute bicycle shed would give access to major cultural, medical, and educational facilities. Additional parks and major employers will be found here including the growing Kapolei government center. This shed provides access to special uses such as the Kalaeloa Airport, and Kalaeloa Heritage Park, Nimitz and Eisenhower beaches, and proposed agricultural uses. The total extent of the 20-minute city is therefore defined by the three-mile radius of the 20-minute bike ride.



The 5-minute walk shed, a quarter-mile from center to edge, defines an individual neighborhood. Each quarter-mile shed should have ordinary daily needs, a range of housing types, and a center (generally a public square or main street with minimal mixed use). Small businesses, at least, are located in the neighborhood.

BALANCING DEVELOPMENT

Beyond a certain minimum density, a walkable urban fabric is necessary to make the 20-minute city work. That implies a connected network of thoroughfares (streets, passages, paths) and small blocks knitting together the neighborhoods. However, given the presence of the large airport itself, as well as the Army National Guard facility, the Kalaeloa network will have interruptions and places of discontinuity. These discontinuous patches will create what the famed urban planner, Jane Jacobs called, “border vacuums”– where urban life on the adjacent blocks is a bit stunted. Recognizing this inevitability, these imperfections can be an opportunity for more industrial uses, or even areas of restored cultural or natural landscapes.



BALANCING
DEVELOPMENT

2.3.2 Project District Approach

The redevelopment of Kalaeloa needs to provide immediate as well as long-term economic value. As such, the HCDA recognizes the need to preserve flexibility in its entitlement efforts to respond to market demands and opportunities as they emerge. To achieve this, a land use regulatory system, based on a cross-section of human settlement known as the “transect of urbanism” replaced the typical parcel-by-parcel zoning classifications within a larger area orientation called a Project District.

The Project District delineates the boundaries of an area, in this case, the entire Kalaeloa District, and identifies a comprehensive list of permissible land uses, the maximum allowable densities, and an overall infrastructure pattern. It does not, however, require that individual development lots be zoned to a specific use prior to actual development, except for special districts - designated for industrial development or airport-related uses. Rather, the Project District system identifies a conceptual land use pattern to guide development. The advantage to this approach is that it provides flexibility for development to respond to contemporary market conditions within an established theme.

A conceptual land use pattern based on the alignment of regional roadway connections can be defined by integrating existing plans and policies such as the ‘Ewa Development Plan and the O’ahu Regional Transportation Plan. The properties bounded by these roadway alignments become “bulk lots” that may eventually be subdivided into smaller parcels.

2.3.3 Interim Uses

Interim land uses, such as storage and maintenance facilities, are temporary, acceptable land uses that do not preclude the intended long-term, preferred land uses from occurring. Allowing interim land uses offers short- to medium-term benefits to Kalaeloa while reserving maximum benefit for future uses. Interim uses shall be reviewed and coordinated with landowners in Kalaeloa for appropriateness, ability to align with the strategic goals and objectives, and ease of redevelopment to the preferred land use. Thus, interim uses that do not contribute to the appropriate mixture of land uses or immediate benefit of the community shall be restricted.

2.3.4 Potential Relocations

Another opportunity to facilitate and enhance redevelopment is the potential relocation of existing uses. While many existing uses are encumbered by deed restrictions placed at the time the properties were conveyed, possibilities exist for HCDA to work with the landowners and federal government to optimize land use within Kalaeloa over the course of the redevelopment period. Existing land uses and potential relocation sites need to be evaluated for their consistency with the overall redevelopment goals and objectives. Further, relocations should not be considered unless there are direct benefits associated with the relocation and there are no impacts to existing uses or services. Examples of unsuitable land uses include municipal waste facilities, heavy industrial factories, and battery recycling centers.

2.3.5 Protecting and Enhancing Open Space and Cultural and Natural Resources

Per HCDA standard practice, development within the District must receive the appropriate approvals from SHPD and other relevant agencies and abide by all Federal and State laws and requirements. Some parcels yet to be conveyed are encumbered with special covenants and are subject to certain requirements and standards therein.



2.3.5.1 Open Space

When NASBP closed in 1999, the community was afforded new access to the shoreline and recreational areas previously restricted for military use. Development projects surrounding Kalaeloa have little to no direct public access to the shoreline and are constrained in the availability of lands for public recreation. An opportunity exists to provide enhanced value to the community through the preservation of open space, shoreline access, and recreational areas. These could include creating a continuous beachfront park along the Kalaeloa shoreline from White Plains Beach to Nimitz Beach, a large central open space/park east of the airport, and a series of linear open spaces and smaller parks that promote bicycle and pedestrian access, allow for storm water retention, and provide for the utility connections through dedicated easements.

The Department of Parks and Recreation (DPR) already operates Kalaeloa Beach Park at Eisenhower Beach, which includes 13 campsites and a comfort station. Appropriate site upgrades and improved public access should be further developed. While beyond the scope of this Master Plan update, it is recommended that a Parks and Open Space Master Plan be commissioned to develop an open space network and implementation strategy in line with the ‘Ewa Development Plan.

The Parks and Open Space Master Plan should include active and passive recreation facilities, athletic fields and sports courts, the relocation or improvement of existing open spaces, and appropriate connections to planned or existing cultural and bicycle trails. A bicycle path along Essex Road as a shared multi-modal roadway, from Barbers Point Golf Course to White Plains Beach, would provide a much-needed recreation corridor for many existing and future residents along the east side of the District. DPR will undertake the master planning process for future parks once the parcels are conveyed. Parks and recreation facilities will be informed by community input and the current Statewide Comprehensive Outdoor Recreation Plan (SCORP).

Although dedicated open spaces and corridors are vitally important for passive and active recreation, a community's street network should also be enhanced to provide public amenities. Shade, either from trees or structures, should always be incorporated to not only foster walkability, but also help reduce the heat island effect. Shared paths and cycle tracks provide mobility options, but also active transportation options that promote healthy lifestyles. Street networks are usually a city's biggest landholding, and so present the greatest opportunities for equitable public access to shade, recreation, and mobility.

2.3.5.2 Cultural Resources

Kalaeloa, as well as the broader ‘Ewa region, are rich in cultural history and significance. The presence of large concentrations of archaeological sites, endangered species, and native plants on relatively undisturbed land in proximity to the Kalaeloa coastline presents an opportunity to revisit the native Hawaiian cultural traditions that existed in the region prior to Western contact and to educate the greater community about the ‘Ewa region’s rich history. To that end, a native hawaiian cultural center at the Kalaeloa Heritage Park may provide a means to spark educational and cultural activities that would attract Hawaiian organizations statewide. The center would expand upon the current programming by also providing an opportunity to develop long-term stewardship programs with government agencies, school groups, and other organizations that focus on restoring and protecting archaeological sites, re-establishing native plant ecosystems, protecting endangered species, and managing ocean resources.

While beyond the scope of this Master Plan amendment, it is recommended that a Cultural Resources Master Plan be commissioned by the appropriate State agencies to map and identify preservation, rehabilitation, and actions for the CDD including the ‘Ewa Plain Battlefield. Currently, there are no comprehensive maps or resources showing the location of all cultural sites and structures in the District. A comprehensive archaeological inventory should be undertaken during the development of the Cultural Resources Master Plan.

Many structures and sites are eligible for listing in the national register and such nominations are to be individually undertaken by property owners over time. Landowners who conduct any ground-disturbing activities or affect a historical structure must first obtain clearance from SHPD. Landowners are responsible for investigating their properties for potential cultural resources and complying with all relevant resource protection laws when they endeavor to develop their parcels. Given the inherent ground-disturbing nature of improving the street network throughout the District, agenices that use Federal funds must consider their effects on historic properties per Section 106 of the National Historic Preservation Act as enforced by the Federal Highway Administration.

2.3.5.3 Natural Resources

According to the Division of Forestry and Wildlife under the State’s Department of Land and Natural Resources, Hawai’i is home to more than 1,400 native vascular plant taxa, 90% of which are not found anywhere else. This combination of diversity and endemism makes the natural ecosystems of Hawai’i unique, but also puts those endemic species at a great risk, especially keeping in mind the archipelago’s history of isolation that makes the native flora particularly sensitive to changes in their ecosystems. The arrival of and contact with humans are considered recent events relative to the islands’ overall history, and these changes in the islands’ environments have demonstrated to be significant and detrimental.

Miyawaki Method

A New Prototype for Urban Afforestation



The Miyawaki method was developed by Akira Miyawaki, a Japanese botanist and plant ecologist. The Miyawaki method– “native forests by native trees” –is based on the traditional Japanese concept of “Chinju-no-mori” (the act of cultivating forests indigenous to the region around shrines and temples) along with ecological science to add trees to a depleted area–afforestation. The Miyawaki method has been successful throughout Japan, Southeast Asia, South America, and China because it recognizes the global scale of ecology and accommodates to the different regions, their environmental conditions, and varying ecosystems.

This method of afforestation aims to create urban forests that take direct inspiration from the complex ecosystems already existing in nature. This is achieved by utilizing species native to the region in an effort to restore the ecosystems indigenous to these respective regions. Native species are more resilient to and appropriate for the bioclimatic conditions of that area, ultimately serving as more effective solutions for addressing climate change. Thus, this restoration of native forests is also the development of protective forests–disaster prevention, environment conservation, and water source prevention. Instead of ignoring and working against the rules of nature, biodiversity, and harmony that allowed wild ecosystems to flourish without human intervention in the first place, this adoption of a traditional method into contemporary society and urban environments seeks to maximize the advantages and strengths of native species in their region.

As a result, Hawai'i is sometimes referred to as the "Endangered Species Capital of the World". The Hawaiian Islands make up less than one percent of the United States land mass, yet 44% of the nation's Endangered and Threatened species are in the islands. Measures to preserve and maintain the biodiversity of Hawai'i's flora are necessary. Rather than be reactive, these actions must be proactive, preventative measures before such changes are irreversible. The success of the Miyawaki method in many different locales have proven its adaptability to different environments and plant taxa, and Hawai'i will be no exception if appropriately adopted. The Miyawaki method is consistent with native Hawaiian restorative forestry practices that included regional and regenerative cultivation predating European and American contact.

In 2016, the Navy submitted a Biological Assessment of parcels that contain the endangered 'akoko plant to the US Fish and Wildlife Service. The assessment detailed biological resources and mitigation recommendations for future use of the parcels including appropriate conservation and management strategies. Any development within the District, including these parcels, must comply with applicable Federal and State guidelines and statutes regarding endangered species.

2.3.5.3.a Native and Urban Forests

The native forest ecosystems of the Hawaiian Islands have been largely destroyed by the large-scale ranches and the sugar and pineapple plantations of the 19th and 20th century and more recently by sprawling suburban and resort developments. Feral ungulates - pigs, goats, cattle, and axis deer - that were introduced by Europeans and Americans have proliferated on the islands and continue to destroy thousands of acres of upland forests annually. Remnants of native forest ecosystems still exist on the highest elevations of the mountains of Hawai'i Island, Kauai, Maui and Molokai, and to a small degree on O'ahu. During the past two decades, there has been some attempt to preserve and restore native forest ecosystems on the Hawaiian Islands, primarily by installing fencing to keep out feral ungulates, but these preservation



'Akoko plant

efforts are still limited by a lack of adequate funding and are often opposed by local communities who claim their rights to traditional subsistence hunting are being taken away. There has also been some recent interest in "urban forestry" - some community organizations are advocating planting more trees along streets to increase shade and enhance habitat.

Forestry Concepts for Kalaeloa could include the following:

- Identify and protect areas of Kalaeloa that have rare/ endangered and/or important endemic or indigenous plants, such as wiliwili trees and the 'akoko shrub.
- Work with Kalaeloa land owners and businesses to form a "Kalaeloa Conservation Corps" that will plan and implement programs for land restoration and afforestation of large areas of Kalaeloa that are not planned for commercial or residential development for the foreseeable future. Plans should include partnering with the Honolulu Board of Water Supply (BWS) to provide recycled "R-2" quality water for the irrigation of newly planted areas. Stormwater runoff from developed areas of Kalaeloa could be conveyed to forested areas for irrigation.
- For areas of Kalaeloa that are planned for urban development, include urban forestry elements in the development plans to achieve a high level of tree cover for streets, parks, and public spaces - ideally an overall tree canopy coverage of at least 30 percent for the urbanized areas of Kalaeloa.
- Incorporate permaculture design principles into land managment programs by prioritizing whole-systems thinking.
- Consider creating a Miyawaki forest as an alternative to a 135-acre city park or on other sites as appropriate.

2.3.5.3.b Agriculture, Farming, and Ocean Foods

“Pre-contact Hawai’i” – the Hawaiian islands and Hawaiian culture before the presence of European and American explorers in the early 19th Century – had an estimated population of close to one million people. The Hawaiian people of that time were completely “food self-sufficient” – as there was no “trade and commerce” between these isolated islands and other islands of the central Pacific Ocean. Native Hawaiians of the pre-contact era had developed sophisticated systems for the cultivation of taro and other land crops, including sweet potatoes, bananas, sugarcane and various edible and medicinal plants and herbs, and fisheries and fishponds that provided protein-rich food. Older Kalaeloa community members have shared their memories of abundant schools of fish that were once found along the Kalaeloa coast.

Now in the early years of the 21st century, the population of the State of Hawai’i is approximately 1.5 million people, and this population is almost entirely dependent on imported food for their day-to-day sustenance. The current estimate in 2021 is that 95% of the food consumed daily in Hawai’i is imported, and that the stores and warehouses state-wide only contain about one week’s supply of food for our 1.5 million inhabitants. In the event that major hurricanes or floods severely damage or destroy Honolulu Harbor, there would be widespread food shortages and famine throughout the State.

Limestone soils are generally not agricultural or good forestry soils. However, areas characterized by relatively poor soils can still be managed to incorporate food and forestry concepts into their development. Also, Kalaeloa – and the ‘Ewa district of O’ahu in general – has a high level of solar radiation at all times of the year and is thus ideally suited in terms of solar energy for the cultivation of edible fruits and vegetables. An indoor development already in operation in Kaka’ako demonstrates the viability of such an endeavor.

General concepts for agriculture and farming for Kalaeloa thus include the following:

- Intensive forms of agriculture, including greenhouses, vertical farming, and aquaponics, would be well suited to Kalaeloa. The previously noted high level of solar radiation in this region of O’ahu is a favorable factor for this type of agriculture. The growing population of the “Second City” of Kapolei and the overall ‘Ewa district provides a large market for quality fresh fruits and vegetables.
- Greenhouses and aquaponics farms could be relatively small in scale and could blend in with future plans and developments for new homes and related land uses in Kalaeloa. These forms of intensive agriculture do not require large volumes of irrigation water – a plus factor for farms in the hot/dry ‘Ewa district which has to import most of its water from Central O’ahu aquifers.
- Programs should be developed for the restoration of Kalaeloa coastal fisheries and limu. Limu is a form of

ocean algae that was traditionally an important source of nutrition for native Hawaiian people. Western farming and development practices and their resulting pollution of nearshore waters have destroyed most of the limu areas of the O’ahu coast. Limu restoration programs would have cultural, educational, and food value. There is a community-based organization in ‘Ewa that has been advocating and working on limu restoration in areas of the local coastline.

- Community organizations that are based in the ‘Ewa district – including the several Community Associations of the residential neighborhoods that have been developed by the Department of Hawaiian Home Lands during the past twenty years – could sponsor and organize some of these small-scale farming projects. Local schools and non-profit organizations could be important organizers and implementers for a “grass roots” farming program for Kalaeloa.
- Master Plans for the future development of Kalaeloa residential neighborhoods could incorporate areas for small scale greenhouses and aquaponics farms, perhaps integrated with plans for parks and green spaces.

The coral sand beaches, the coastal zone and the nearshore waters of Kalaeloa are precious resources that must be integrated into the overall plans for this Community Development District through proper stormwater management.

2.3.6 Addressing Regional Traffic Congestion

Due to increased development and the necessity to commute to school and work, traffic on existing arterial roadways and the H-1 Freeway is congested on a daily basis. Roadways such as Farrington Highway, Roosevelt Avenue, and Geiger Road provide some relief in the east-west direction but are also frequently congested. Construction of Kualaka’i Parkway and completion of the Kapolei Parkway have improved ingress and egress; however, additional measures are necessary to reduce regional traffic congestion. One of these measures is the development of Kalaeloa according to the principles of the 20-minute city. In addition, increasing roadway connectivity, and seeking a mode of mass transit will be critical.

Consistent with the principles of the 20-minute city, another approach to reducing regional traffic congestion is to increase employment opportunities in the ‘Ewa region, thereby reducing the necessity for area residents to commute outside the region to work.

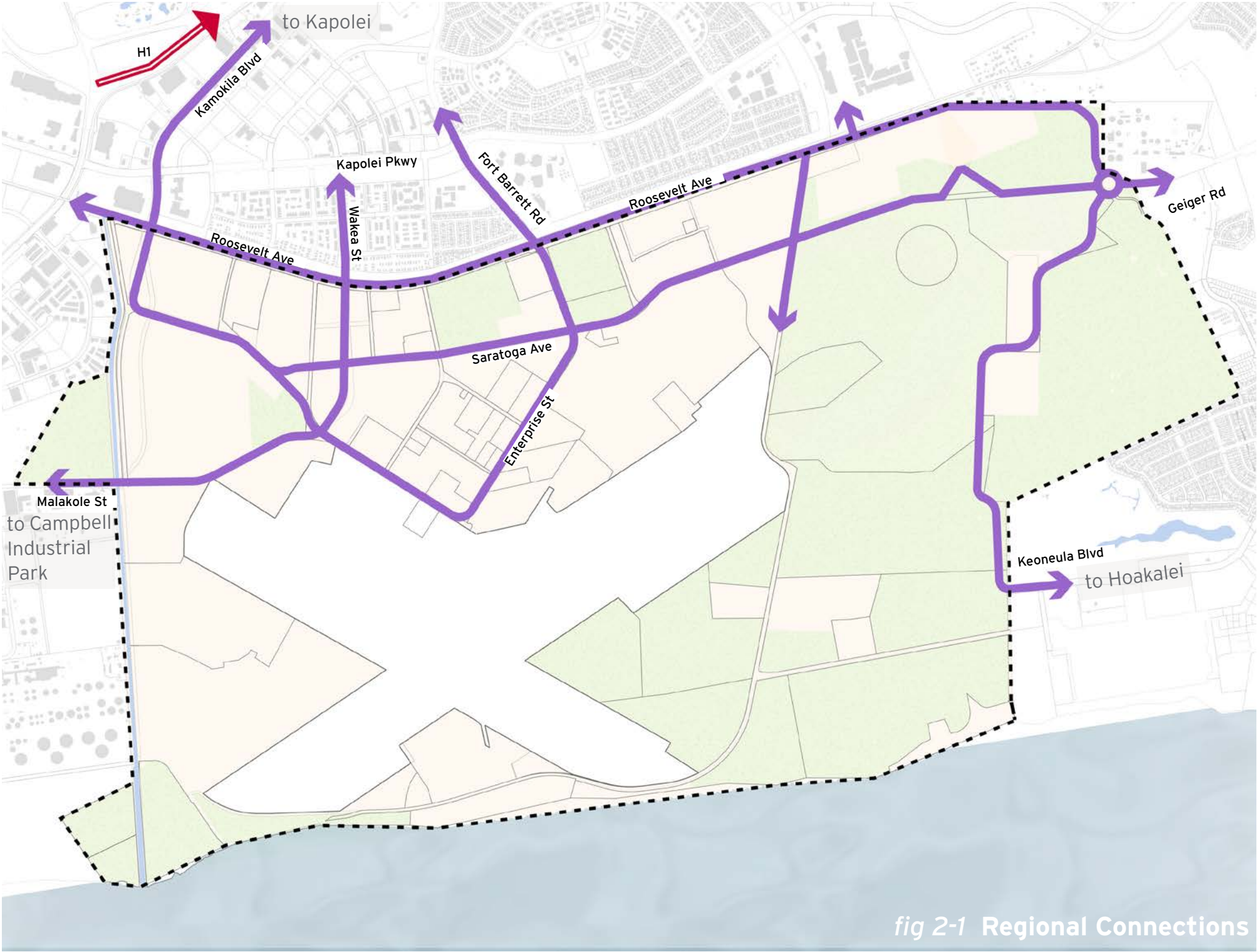


fig 2-1 Regional Connections

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KALAELOA MASTER PLAN



BALANCING
DEVELOPMENT

2.3.6.1 Streets & Roadways

Improvements to the street network within and adjacent to Kalaeloa present an opportunity to enhance regional connectivity both east-to-west and north-to-south and improve vehicular traffic flow within the 'Ewa region. In addition to current regional transportation plans and ongoing road improvement projects, several new improvements are proposed. (Refer to Figure 2-1) Any streets crossing historic resources, such as the Historic Hawaiian Railway at Renton Road, must receive the appropriate approvals from SHPD and other relevant agencies and abide by all Federal and State laws and requirements.

- Create a new Keoneula Connector Road from Roosevelt Avenue and Geiger Road to Keoneula Boulevard at the west end of Hoakalei to provide access from the eastern portions of Kalaeloa to the H-1 Freeway, and relieve traffic congestion on Fort Weaver Road. The alignment of this important connector road has been revised from the 2006 Master Plan in order to accommodate the development of the 'Ewa Plain Battlefield Memorial.
- Create a major east-west spine road within Kalaeloa by realigning and connecting portions of the existing Saratoga Avenue from Geiger Road in the east to the proposed western connection to Kalaeloa Boulevard. The alignment of this important connector road has also been revised from the 2006 Master Plan, again to accommodate the development of the 'Ewa Plain Battlefield Memorial.

- Enhance vehicular circulation and connectivity with Fort Barrette Road, and connections from Kalaeloa to the H-1 Freeway.
- Coordinate with the development of Mehana at Kapolei to provide a roadway connection to the planned Wakea Street extension and the planned new interchange with the H-1 Freeway.
- Support implementation of an extension of Roosevelt Avenue west to Kalaeloa Boulevard in Campbell Industrial Park.

In 2016, the City of Honolulu released the *Complete Streets Design Manual* to ensure that public streets and surrounding spaces serve everyone's transportation needs, whether by car, bike, bus, rail, or foot. New streets in Kalaeloa should reflect this vision and be built to such standards.

DRAFT

KALAELOA MASTER PLAN

2.3.6.2 Bicycle Trails

The flat topography of Kalaeloa renders the area an ideal location for encouraging the use of bicycles as an alternative to motorized vehicles. Routing of bike paths should provide for connectivity within Kalaeloa, access to the beaches along the ‘Ewa shoreline, and connections to existing and proposed regional paths such as the Pearl Harbor Historic Trail and the Leeward Bike Path.

The 2019 O’ahu Bike Plan Update built upon the previous Kalaeloa Master Plan bicycle tails in the area with an expanded network for improved connectivity and efficiency. This Master Plan recognizes these regional efforts and incorporates them accordingly:

- Leeward Bike Shared Use Path (Phase 1): Waipio Point Access Road to Hawaiian Railroad Society Train Station
- Leeward Bike Shared Use Path (Phase 2): Lualualei Naval Road to Hawaiian Railroad Society Train Station
- Boxer Road Bike Lane: Roosevelt Avenue to Midway Street
- Coral Sea Road - Saratoga Avenue Shared Use Path: Around Kalaeloa Airport



- Roosevelt Avenue Bike Lane: Renton Road to Geiger Road
- Eisenhower Road Shared Use Path: Coral Sea Road to Tripoli Road
- Enterprise Street Bike Lane: Renton Road to Saratoga Avenue
- Enterprise Street Shared Roadway: Saratoga Avenue to Midway Street
- Essex Road Shared Roadway: Geiger Road to White Plains Beach
- Hornet Street Bike Lane: Leeward Bikeway to Saratoga Avenue (Realignment Necessary to Wakea Street Extension)
- Midway Street/Mumba Street/Saratoga Avenue Bike Lane: Boxer Street to Malakole Street
- Olai Street Shared Roadway: Coral Sea Road to Barbers Point Beach Park
- Keoneula Boulevard Extension Shared Use Path: Coral Sea Road to Kamakana Street
- Kualakai Parkway Shared Use Path Extension: Kapolei Parkway to Tripoli Road (Realignment necessary due to ‘Ewa Plain Battlefield)
- Saratoga Avenue (Extension) Bike Lane: Boxer Road to Geiger Road (Realignment necessary due to ‘Ewa Plain Battlefield)

2.3.6.3 Historic Railroad

Kalaeloa also provides an opportunity to support future initiatives and the expansion of operations of the Hawaiian Railway Society, which uses tracks within the O’ahu Railway and Land Company right-of-way (ROW). The historic O’ahu Railway and Land Company railroad tracks abut the northern property boundary of Kalaeloa, and continue past Campbell Industrial Park, through Ko Olina to Kahe Point on the leeward coast. The railroad is also part of the Pearl Harbor Historic Trail. However, the presence of this historic ROW should not prevent making the necessary mauka/makai street connection at Wakea Street extension from crossing these tracks.

2.3.6.4 Integrating Mass Transit

There is a reemergence in interest to identify a transit-oriented solution to resolve traffic congestion, especially in the ‘Ewa region. Recent approvals by the State Legislature and City Council have paved the way for an alternatives analysis and draft environmental impact statement for a preferred transit alignment from Kapolei to Honolulu. At present, the City’s ‘Ewa Development Plan and the Kapolei Area Long Range Master Plan both indicate potential transit corridors on Farrington Highway, Kualaka’i Parkway, and extending to the west along Kapolei Parkway with a termination proximate to Kalaeloa Harbor.

A unique and timely opportunity exists to align the continuation of the rail corridor at the edge of Kalaeloa at Roosevelt Avenue. Such a routing would substantially increase land values and the marketability of properties along the corridor. The land use densities typically associated with transit-oriented development further suggest that multi-family housing development in the form of townhouses and walk-up apartments presents an attractive alternative to the extensive single-family lot development throughout ‘Ewa.



Further, moderate density multi-family residential development presents an opportunity to provide significant opportunities for rental units with a high percentage in the affordable category. A transit corridor would also provide an efficient means of transporting workforce employees in and out of Kalaeloa, thereby reducing dependence on personal motor vehicle transportation.

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3.0 The Mixed-Use Concept

3.1 The Neighborhood Concept

3.2 The Transect of Urbanism

3.3 The Thoroughfare Network

Creating the 20-minute city is the key concept in making Kalaeloa a Center for Excellence. This chapter outlines the strategies and tactics necessary to implement that concept into physical form.

Chief among these strategies is the mixing of land uses and housing types across the entirety of developable area. This allows for many of life's daily activities to be within walking or biking distance of residents and members of the local work force, resulting in a vibrant public realm. Supporting that strategy is a set of mixed-use neighborhoods that differ in scale and building intensity, but are linked together to support a greater whole. Rather than conventional zoning to codify these ideas, the concept is regulated across a cross-section of urbanism called the "Transect" which regulates by scale and density, not by use (for the most part). This will allow a range of businesses, housing types, and services to locate in proximity to each other thus supporting the accessibility, walkability, and neighborly interaction that result from the full implementation of the 20-minute city.

The street network also plays a vital role in achieving the walkable and bikeable environment required by the 20-minute city. Creating streets that provide as much deference to the pedestrian as they do to the car is called "Complete Streets" and is critical to making Kalaeloa healthier, safer, and greener.



CONCEPTUAL
For Illustrative Purposes Only



- LEGEND**
- 5-Minute Walk
 - ↔ Regional Connection
 - ⊙ District Gateway
 - Rail Transit Station
 - ■ ■ Kalaeloa CDD Boundary

- Mixed-Use Area
- Higher-Intensity Area
- Ground-Floor Activation

- EWA PLAIN BATTLEFIELD**
- Ewa Plain Battlefield National Register Boundary
 - - - Ewa Plain Battlefield Memorial Proposed Boundary

The Ewa Plain Battlefield was listed in the National Register in 2016. Under federal law, the listing of a property in the National Register places no restrictions on what a non-federal owner may do with their property up to and including destruction, unless the property is involved in a project that receives federal assistance, usually funding or licensing/permitting.

The black dashed line illustrates the boundary of the National Register listing whereas the yellow dashed line illustrates the boundary of a proposed Memorial Park. While a private owner may have full discretion over the site, the Plan proposes a publicly-accessible memorial to honor the lives lost on this hallowed ground.

Note: This Illustrated Plan is conceptual in nature and is not prescriptive. It is solely intended to demonstrate what development in Kalaeloa may look like. For illustrative purposes only.



fig 3-1 Illustrated Plan

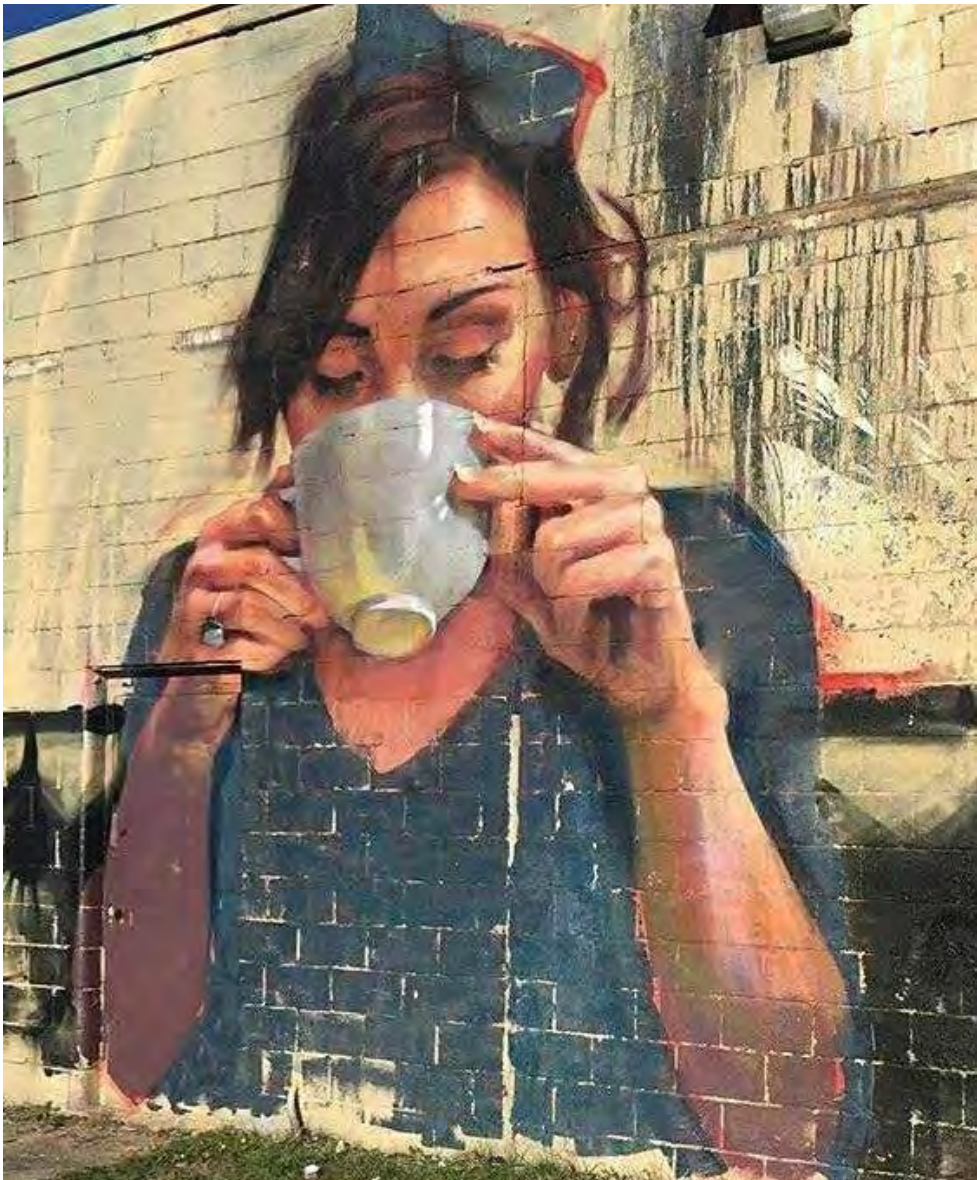
3.0 The Mixed-Use Concept

The diminishing supply and relatively high value of land on O’ahu necessitates the serious and practical consideration of intensifying land uses, especially when viewed from a long-term perspective. As growth of the ‘Ewa region continues, mixed-use and compact development patterns are essential strategies in creating a walkable and bikeable community, *i.e.*, in achieving the 20-minute city. The inclusion of mixed uses maximizes the highest use of developable land.

The Master Plan allows and encourages the development of higher density housing within the mixed-use parcels. Rather than relying solely on low density single-family development with segregated commercial areas, which is the prevailing pattern of residential development in other ‘Ewa neighborhoods, the Master Plan offers increased choices of residential opportunities, from small-lot houses and townhouses to apartments. The mixed-use parcels identified in the Regulating Plan integrate housing and commercial uses, allowing retail and other employment uses within the same block and even the same building. For multi-story buildings, mixed-use could include retail or commercial on the ground floor with apartments or office space on second, third, and fourth floors.

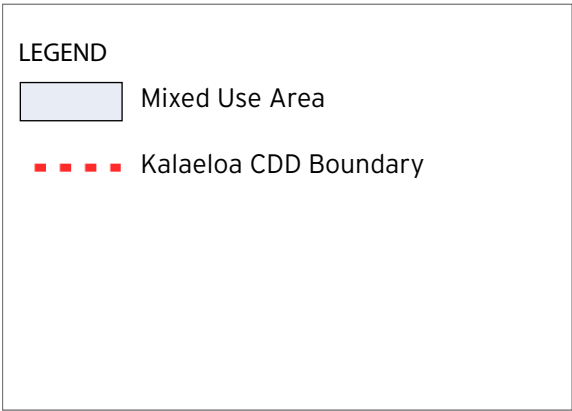
Walkability and connectivity are key attributes of the 20-minute city. Buildings designed to the moderately higher densities associated with mixed-use development enhance the pedestrian experience for residents and employees when developed along a finely-grained street network.

The mixed-use areas identified in the Regulating Plan are generally characterized by a mix of retail and commercial activities, airport-related businesses, warehouses for storage and distribution, offices, service and support functions, and residential uses.



The mixed-use area of Kalaeloa is on the mauka side of the airport and encompasses approximately 900 acres. The primary objective for the mixed-use area, or “Downtown Kalaeloa,” is to create a physical environment that supports the evolution of the “20-minute city.” To that end, this area will be a place where:

- Residents can walk or bike to work, school, the local transit station or mobility hub, or to the essential services needed for day-to-day life as well as to enjoy the cultural amenities of the Kalaeloa community, and the region at large.
- A variety of mobility options allow for ease of movement within the area to the region at large.
- Neighborhood streets are valued beyond their ability to carry traffic, but as significant urban places in and of themselves, because they are where neighbors, friends and colleagues meet and socialize. They are supported by streets with sidewalk cafes lively plazas, and restful parks.



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3.1 The Neighborhood Concept

The Mixed-Use neighborhood is the building block of the 20-minute city, in which many of life’s daily needs are a 20-minute walk, bike, or bus-ride away, and a key to supporting walkable urban places. This, in turn, will support economic development by helping to attract new employers and employees, to live, work, shop and play in the neighborhoods of Kalaeloa.

Some of the features of everyday life should be available in each neighborhood, which when linked to each other, can form an eminently livable and sustainable city. Such features would typically include a variety of housing types, and price-points, parks, plazas, and other places to recreate, and at least a few everyday services or amenities, such as local serving retail, professional services, and the like. Some neighborhoods



may be more intense and also contain significantly-sized employment areas with more robust retail activities.

In addition to these characteristics, four key strategies will be critical in realizing the Vision for Kalaeloa as a city of neighborhoods, which itself is key to building the 20-minute city. These include:

- **Saratoga Ave.** as well as other framework streets are key to linking neighborhoods to each other. Serving as Kalaeloa’s “Main Street,” Saratoga has the potential to become the area’s signature street - an iconic and memorable place. Pedestrian-friendly building frontages and wide sidewalks are particularly important along Saratoga, as with the primary thoroughfares linking neighborhood centers to one another.
- **Multi-modal connectivity** between adjoining neighborhoods and activity centers is key to unlocking the value of mixed-use infill development, which offers convenient access to nearby jobs, housing, recreation and commercial amenities. Bus routes will need to be reconfigured to connect these neighborhoods, while region-wide transit, such as an extension of the HART light-rail line, should be prioritized for the future. This will facilitate the evolution of a 20-minute city.
- **Placemaking**, a planning concept that carefully links the public circulation and open space network with existing and new private development, is key to the development of these neighborhoods. Making great places is the payoff

for connected, mixed-use development. By carefully coordinating public circulation and open space networks with existing and new private development, each new increment of infill adds value to surrounding, connected neighborhoods and properties.

- **Pedestrian Friendly** design can bring daily necessities within an easy walk of many residents, stimulating economic activity while reducing the stress on transportation systems. Thus, neighborhoods should be limited in size to the distance a pedestrian can walk in five minutes- roughly 1/4 mile from the center of a neighborhood to its edge- as well as provide a street network that prioritizes pedestrian safety and comfort. Local streets should be woven into the network to create walkable block-sizes.
Building design should reinforce the pedestrian orientation of the neighborhoods by gently framing the streets and public spaces to provide visual delight that makes walking a joy. New development should always front streets with human-scale, pedestrian-oriented frontages, an ensemble that is tailored to specific street types and includes sidewalks, curbs, planters, bicycle facilities, and street trees that provide shade. Design standards should emphasize the continuity of public frontages with buildings or landscape edges while discouraging surface parking lots and blank walls.

To accomplish these objectives, the plan identifies several neighborhoods sized according to the five-minute walk, three of which are centered along Saratoga Avenue, from Boxer Road to Enterprise Street like a string of pearls. A mix of uses is encouraged along Saratoga (where in some cases it is required) and at other neighborhood centers. This land-use mix can take the form within buildings themselves by containing a vertical mix of uses such as apartments over a ground-floor cafe, or within neighborhoods (horizontal mixed-use) such as a row of townhouses with a convenience store at the corner of the block to bring daily necessities within an easy walk of many residents. This pattern makes bus service more feasible, even as it makes walking and biking safer, resulting in a high degree of multi-modal connectivity between adjoining neighborhoods and activity centers. Each of these neighborhoods have distinct and differentiated centers, but are linked to create a larger sense of place.

LEGEND

Saratoga Ave Neighborhood

Pedestrian-oriented Ground Floor

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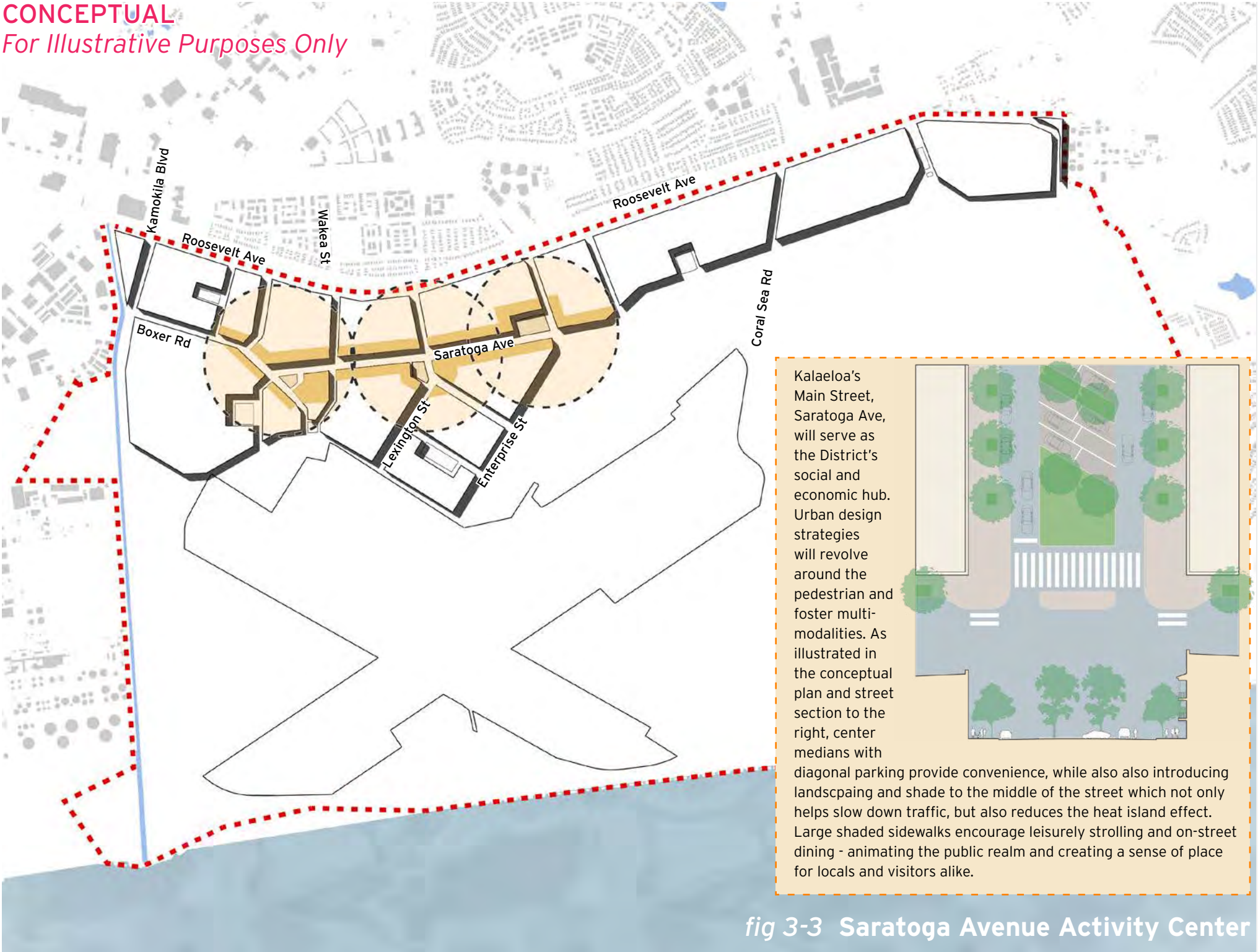
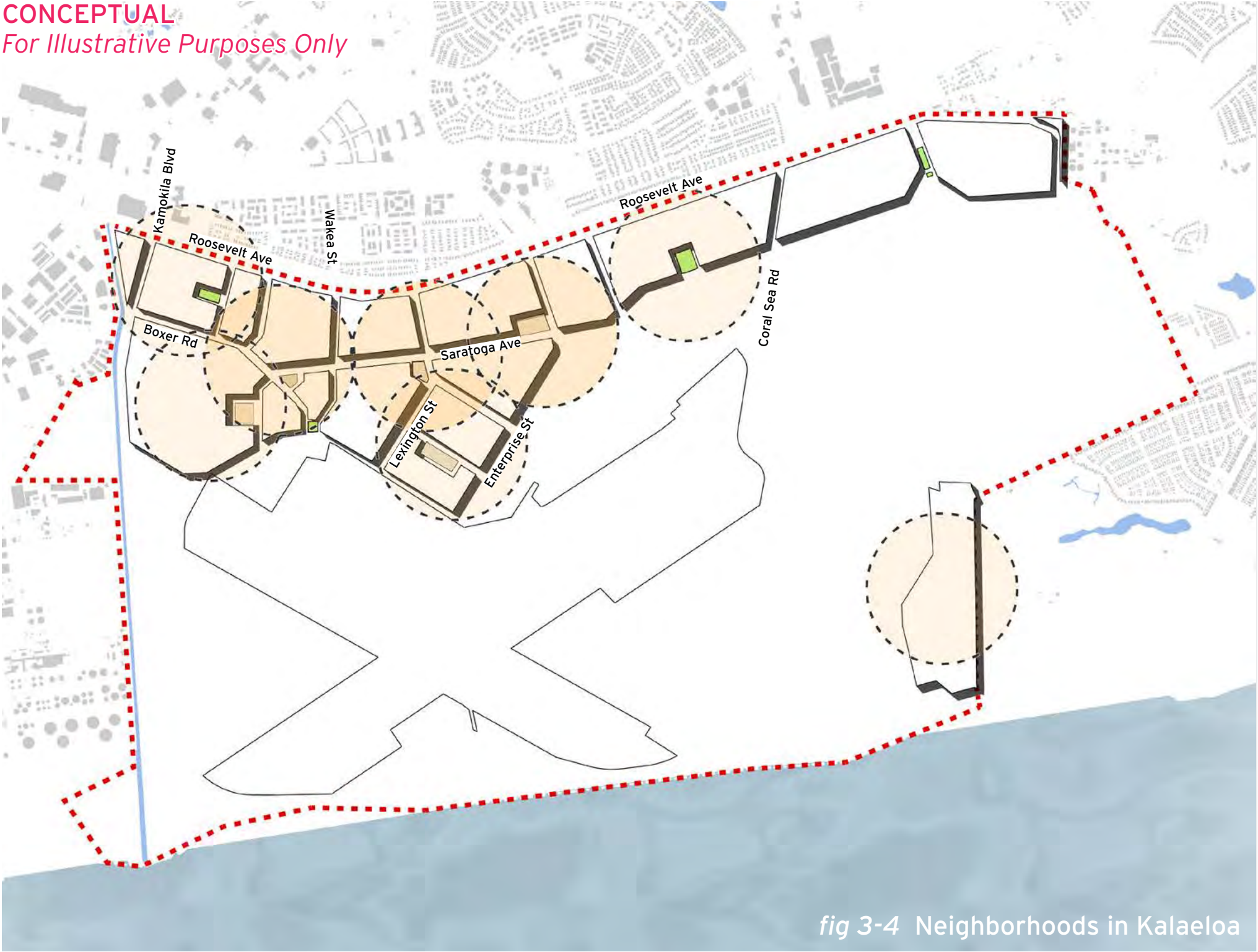
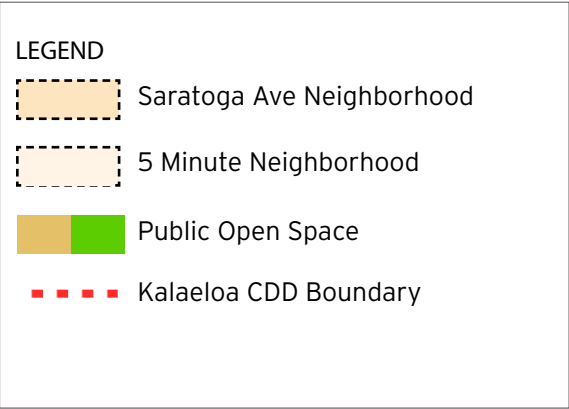


fig 3-3 Saratoga Avenue Activity Center

A neighborhood is nestled between the airport runways, following the historic block structure of the shuttered naval air station, while another is envisioned at the end of the north western runway. Two other neighborhoods link Kalaeloa to the surrounding communities, one abutting Roosevelt Avenue adjacent to Kapolei while the other is located along Tripoli Road and the Keoneula Boulevard extension leading to Hoakalei and the future Wai Kai development.

While each neighborhood will have its own set of characteristics, each will include a range of densities that will allow for new development to meet varying market conditions. Typically, this range of density will be graduated, with the densest and most diverse areas being in the center (when the center sits along Saratoga). The neighborhoods will also feature a diverse mix of uses, with places to work, live, learn, shop and play -- all within a walkable area. Mixed-use neighborhoods engender collaboration and empathy, making them more resilient in the face of adversity.



Each neighborhood is supported by a new local street network that supplements the existing framework of public streets, as shown in conceptual illustrated plans for Kalaeloa neighborhoods in Figures 3-5 and 6. The insertion of this local street network results in the creation of smaller blocks and higher intersection density than in typical suburban development, and is similar to recent local development at Mehana, a highly walkable neighborhood, that provides safety for pedestrians and motorists alike.



fig 3-5 Illustrated West Saratoga Neighborhood

Within the Mixed-Use neighborhoods, public spaces like parks or plazas shall be generally located in the areas shown on the Regulating Plan. Precise configuration of park sites shall be determined at the time of site plan approval, but a conceptual plan of a neighborhood with public open spaces is shown in Figure 3-6. In general, each of the neighborhoods should include at least 5% of its developable area to public space with there being at least one main public space within 800 feet of the geographic center of each of the aforementioned neighborhoods. Within 800 feet of every lot provided for residential use, a civic space designed and equipped as a playground should be provided.

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fig 3-6 Illustrated East Saratoga Neighborhood



fig 3-7 Kalaeloa Existing Conditions - Makai

DRAFT

KALAELOA MASTER PLAN



400 ft

CONCEPTUAL
For Illustrative Purposes Only

fig 3-8 Kalaeloa Conceptual Master Plan Build Out - Makai



DRAFT

KALAELOA MASTER PLAN

fig 3-9 Kalaeloa Existing Conditions - Mauka



DRAFT

KALAELOA MASTER PLAN

fig 3-10 Kalaeloa Conceptual Master Plan Build Out - Mauka



DRAFT

Figure 3-11 Open Space Plan illustrates the publically-accessible open space network. An equitable distribution of open spaces in neighborhood centers and within the fabric of the neighborhood itself will ensure a livable and lively public realm. These spaces shall be fronted by streets and buildings ensuring “eyes on the park.” Public spaces in neighborhood centers are generally hardscaped to easily accommodate various activities, such as farmers markets and festivals.

Alternatively, public spaces within the neighborhood fabric are generally landscaped for recreation, such as sports fields, parks, and playgrounds. An approximately 220-acre assemblage of parcels along Saratoga Avenue, tentatively known as Kalaeloa Regional Park - Mauka has the potential to provide significant area for active sports fields, including baseball and soccer, play courts for basketball and tennis, riding stables and a riding center, a swimming center, and other active and passive recreational facilities including open areas for picnicking, and public events.

Another assemblage that includes the existing Kalaeloa Beach Park, and a future Kalaeloa Regional Park - Makai, bracket both sides of Tripoli Road. The campground could be expanded to include enhanced bathroom and shower facilities, as well as significantly more camp sites. New parking areas and

LEGEND

Public Open Space - Center

Public Open Space - Neighborhood

Rural Zone

Beach

Kalaeloa CDD Boundary

CONCEPTUAL
For Illustrative Purposes Only



connecting lanes (for example, the completion of Eisenhower Road) would allow significantly enhanced access by the general public. Other facilities could include picnic/shade pavilions, restrooms, pedestrian trails, playfields, multi-purpose open space(s) for casual sports, picnics and community events, shade trees, and an ocean educational center are all possible uses, as well as a lawn detention area for enhanced storm water management. The Department of Parks and Recreation will undertake the master planning process for future parks once the parcels are conveyed.

Each of the neighborhood centers should accommodate a shaded bus stop providing frequent service to the Kapolei Transit Center. The Plan proposes increasing the headways for the existing 415 Kapolei Transit Center route along with the addition of two new routes: one along Saratoga Avenue, and another along Coral Sea and Tripoli Roads. Future bus routes will be developed at the discretion of Oahu Transit Services.

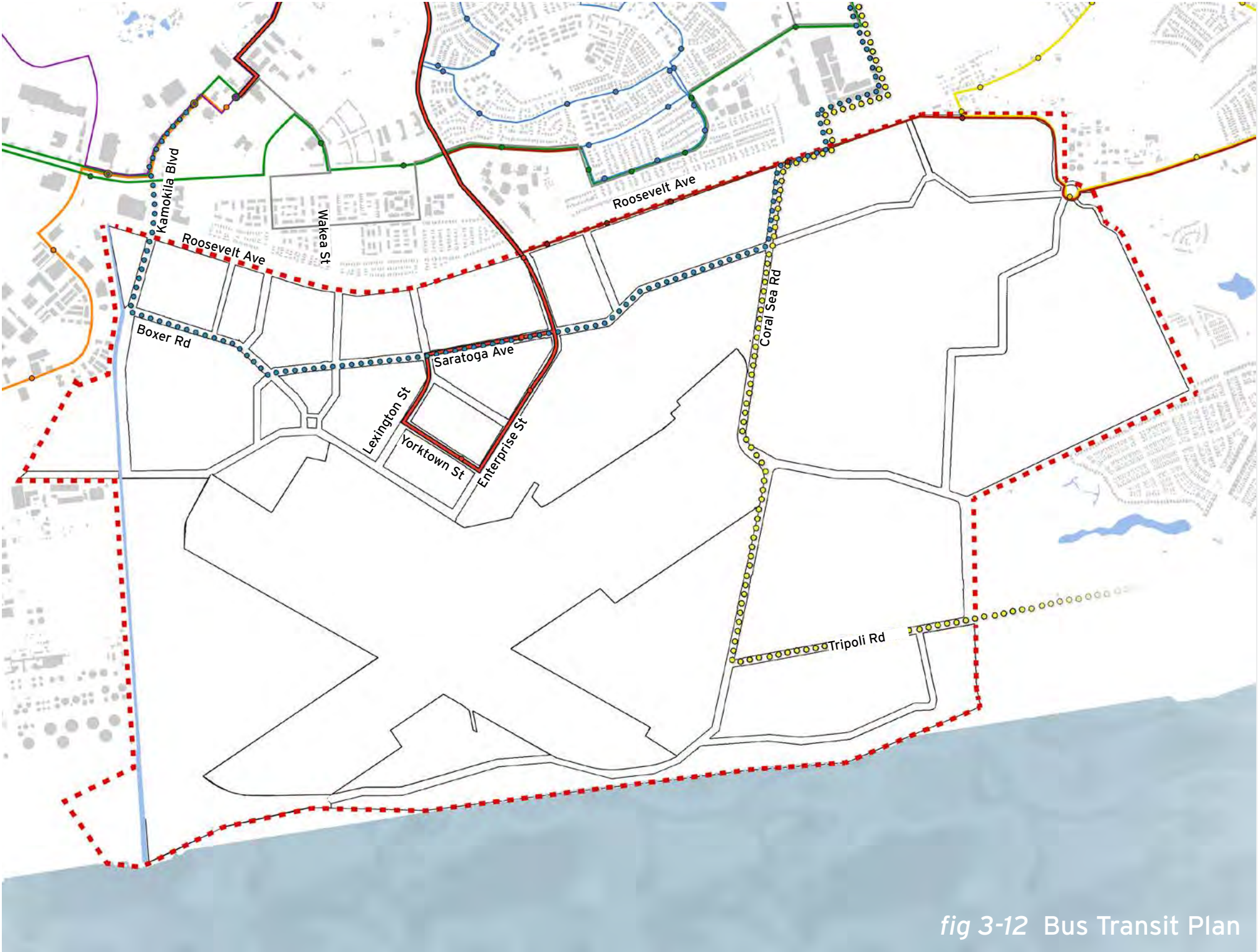
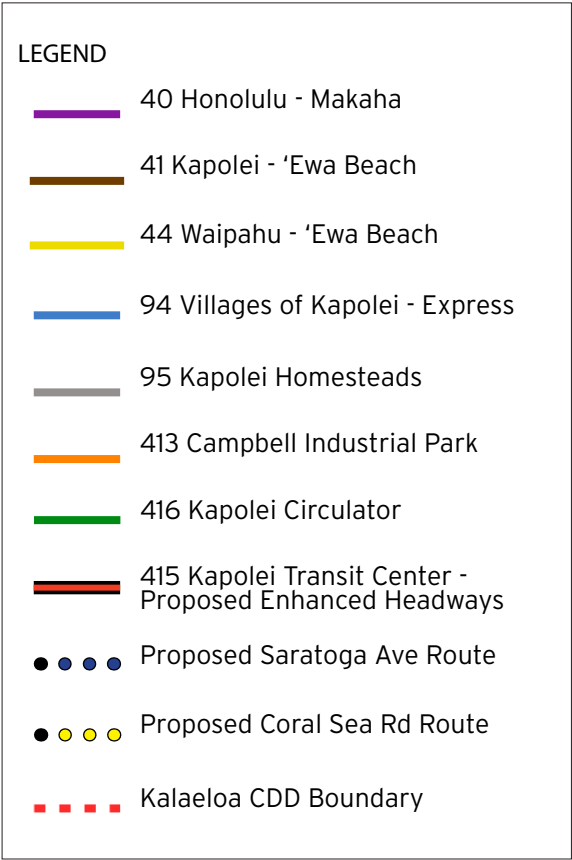


fig 3-12 Bus Transit Plan

3.2 The Transect of Urbanism

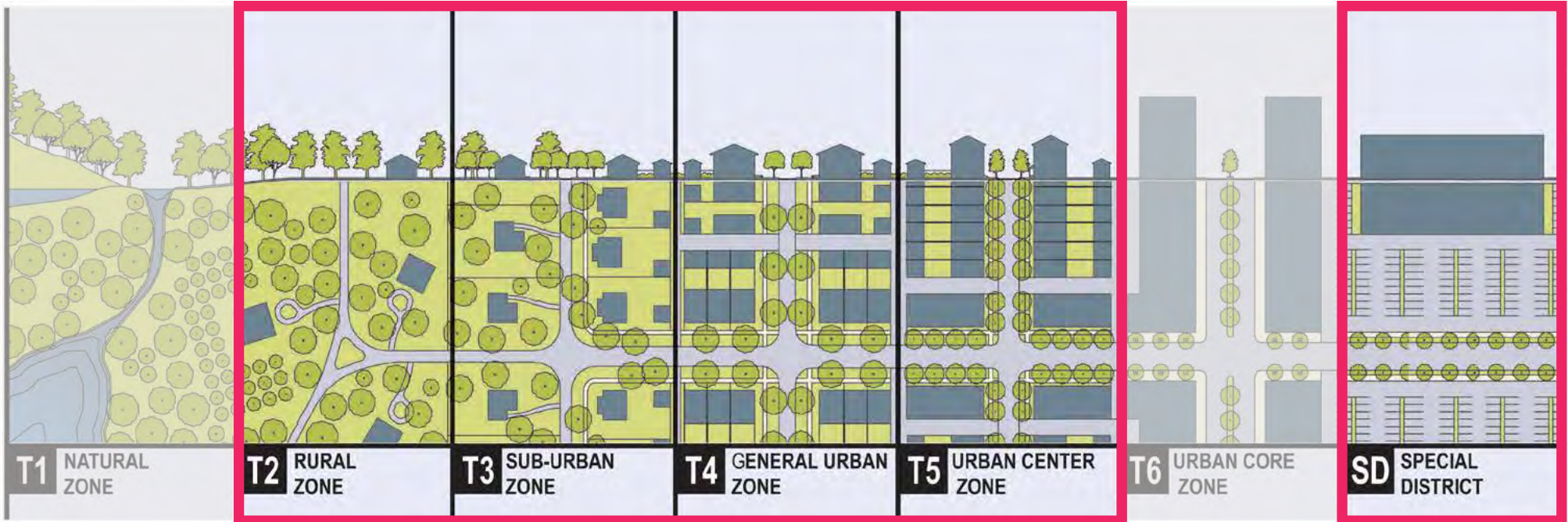
The Mixed-Use areas of Kalaeloa allow for a range of housing and commercial densities, so that new development reinforces the proposed neighborhood structure and can meet varying market conditions. The range of permitted densities are calibrated on a graduated scale from the center of a neighborhood to its edge, which is known as the “Transect of Urbanism.” Each section along this scale is called a transect.

The Transect of Urbanism is a conceptual cross-section of human settlement that transitions from un-developed natural areas (T1) to the dense urban core (T6). Each zone is a fractal* in that it contains a similar transition from the edge to the center of the neighborhood, though possibly at different scales. Dense cities are the most economically efficient, the most environmentally sustainable in that they encourage community and healthy lifestyles.

The aim is not to create a density mix similar to a downtown Honolulu or Kakaako, but to reimagine the typical low rise and low-density, single-use suburban neighborhoods with a more densified suburban neighborhood to achieve more units per acre, a more walkable neighborhood, a possibility to include amenities and introduce transit, and require less surface parking lot areas.

***What is a Fractal?**

A fractal is a repeating pattern that, while infinitely complex, is actually self-similar across different scales. They are created by repeating a simple process over and over in an ongoing feedback loop.



The Rural-Urban Transect - Courtesy of Duany Plater-Zyberk & Company

In lower intensity employment centers, for example those in T3 areas and lower density T4 areas, surface parking lots are the norm as densities do not justify the increased cost of building parking garages. However, surface lots often destroy the sense of enclosure within the public realm, disallowing “civic rooms” by their lack of spatial definition. For economic reasons, surface lots are also rarely implemented with a level of detail that befits a public plaza. Therefore, in walkable urban environments it is advisable to separate parking lots from primary street frontages by buildings and for these parking lots to be screened from secondary street frontages with screening devices such as fences, walls or hedges when buildings are not feasible along those edges.

In higher intensity areas, such as T4 zones and T5 zones, parking is normally placed in above-ground garages. Such garages should be screened and out of view from primary streets and be lined with active uses to enhance the pedestrian experience.

Not all portions of the Transect are applicable to all areas. In fact, Kalaeloa is imagined as including T2 through T5 zones with a mix of live work and amenities of different densities and heights to respond to the characteristics of each T-zone, such that the result is a repeating pattern of neighborhoods resulting in a vibrant, attractive community for a variety of residents and businesses. The overlap between zones in building intensity and form is intentional and, allows for a coherent and built environment with gradual transitions.

The presence of the airport and the military mean that much of Kalaeloa is not subject to zoning according to the Transect model. These areas, known as “Special Districts,” serve single purposes and are subject to separate regulations and rules, due to primacy of federal jurisdiction. This will be the basis for zoning regulations governing this area. The Master Plan designates transect zones, special districts, and district overlays to provide the framework for a finely-grained, diverse and sustainable Kalaeloa.

In order to develop an effective Master Plan, all developable land has been designated into transect zones, regardless of land ownership and development authority. If land changes ownership, the Plan will provide a community-based vision for its development.

LEGEND

T2 - Rural Zone

T3 - R Neighborhood Residential Zone

T3 - M Mixed-Use Zone

T4 - General Urban Zone

T5 - Urban Center Zone

Special District 1 - Light Industrial

Special District 2 - Airport Zone

Special District 3 - Active Military Use

Public Open Space

Saratoga District Overlay

Gateway District Overlay



fig 3-13 Regulating Plan

3.2.1 Transect Zones



3.2.1.1 T2 Rural Zone

The T2 zone is comprised of large lots with natural landscapes, beaches, developed and undeveloped park areas, pedestrian and bicycle trails and limited agricultural use. The T2 zone shall consist primarily of lots along the ocean, lots reserved for regional parks or open space. Cultural, archaeological, and environmental uses and sites such as the Kalaeloa Heritage Park and the ‘Ewa Plain Battlefield, shall also be located within the T2 zone. Properties located within the T2 zone may also contain civic uses such as museums, libraries, fire stations, aquatic centers, playfields and the like, as well as the requisite surface parking required for these activities.

Properties in T2 may also include “Eco-Industrial” uses defined as environmentally-compatible industries that benefit the entire population of O’ahu. Potential industries such as solar or hybrid energy generation, bio filtration, hydroponic farming or other such technologies are compatible in these parcels. These industries require large land areas and can be located within the airport’s Runway Protection Zones (RPZ) where height restrictions limit development or, in some areas, where noise contours resulting from airport activities exceed 65 Day-Night Average Sound Level (DNL). These parcels are specifically intended to contribute to resolving the State’s continuing dependence upon fossil fuels and food imports. Any occupiable structures built within these areas must comply with FAA requirements for development within RPZs.

3.2.1.2 T3-R Neighborhood Residential Zone

The T3-R Neighborhood Residential (T3-R) zone is characterized by small-lot single-family residential development (attached or detached), duplexes, townhomes, and small apartment buildings, but may also include small live-work spaces, home-offices or workspaces, and bed and breakfast inns. Limited amounts of local-serving retail, civic support uses such as medical clinics and small office structures, particularly at intersections, are also permitted in the T3-R Zone. Generally, buildings are not taller than three stories and are surface-parked in the side or rear of the lot. Residential densities range from 8-20 dwelling units per acre (du/acre) and commercial uses are not to exceed 1.0 FAR.



3.2.1.3 T3-M Mixed-Use Zone

The T3-M Mixed-Use (T3-M) zone is primarily located along the main thoroughfares of Roosevelt and Saratoga Avenue. It is characterized by larger lots containing commercial and light industrial uses that produce less adverse air, noise or visual impacts than those of the Special District - Light Industrial Zone, which is more intense. The T3-M zone contains a mix of commercial and light industrial uses, logistics, and their appurtenant office and warehousing uses, though residential uses are also permitted particularly adjacent to T2 area. Buildings are set farther from the sidewalks but may have retail or offices fronting the street. Vegetative screening is required to wrap large areas of parking, loading, or buildings with blank walls. Streets include curbs and sidewalks on large-sized blocks. Sites with large surface parking lots are opportunities for incorporating photovoltaics panels, both to generate electricity and to reduce the heat island effect.



3.2.1.4 T4 General Urban Zone

The T4 General Urban zone contains a diverse mix of uses at higher intensities than T3. Residential building types generally include townhomes and urban apartment buildings, as well as live-work spaces. Retail, hotel, and office uses are permitted. Generally, buildings are not taller than five stories and may have a mix of garage and or surface parking in the rear of the lot or the middle of the block, screened from view. Residential densities range from 16-40 du/acre and commercial uses do not exceed 2.0 FAR. Lots located along Saratoga Avenue are also subject to the Saratoga Overlay Zone.



3.2.1.5 T5 Urban Center Zone

The T5 Urban Center Zone includes a diverse mix of uses at higher intensities than T4 with the highest allowable density and height, containing a mix of retail, office buildings, civic uses and residential. The T5 zone is the vibrant and bustling heart of Kalaeloa. Buildings are set close to the sidewalks to activate street life and sidewalks are wider to accommodate outdoor dining and public street furniture. Buildings are generally not taller than seven stories and will have garage parking screened from view along primary streets. Residential densities range from 40-100 du/acre and commercial uses do not exceed 5.0 FAR. Civic spaces include urban parks, plazas and squares. Tree-lined streets include curbs, sidewalks and landscaping on smaller-sized blocks with Complete Streets features and traffic-calming techniques implemented throughout. Lots located along Saratoga Avenue are also subject to the Saratoga Overlay Zone.

3.2.2 Special Districts - Single Use Only



3.2.2.1 Special District 1 - Light Industrial Zone

The Light Industrial zone is primarily located along the District’s western boundary line, adjacent to Campbell Industrial Park’s heavy industrial uses just outside the District. It is characterized by large lots containing light industrial uses and their appurtenant office, warehousing, and commercial uses that produce more intense air, noise or visual impacts than land uses within the mixed use T-zones. Buildings are set farther from the street, but may have retail or offices fronting the street. In lieu of retail or office uses fronting the street, vegetative screening wrapping the primary uses within each large lot is required. Blocks are large and streets do not include curbs and sidewalks.

3.2.2.2. Special District 2 - Airport Zone

Airport Zone is located at the center of the district and is identified as parcel HDOT-A, with the Kalaeloa Airport as the largest active land use in this zone. The airport is envisioned as an economic driver, creating jobs and providing services as population in the ‘Ewa region continues to grow. The State Department of Transportation identifies Kalaeloa Airport as a general aviation airport and as reliever to Honolulu International Airport. An 18-acre circular parcel in the northeastern portion of Kalaeloa is the site of the existing Federal Aviation Administration (FAA) navigational aids serving Honolulu International Airport.

All lots located within the Airport Zone are designated due to their function as an aviation, navigation or military installation or ownership by the Federal government as of the effective date of these rules. All lots located within the Airport Zone shall be governed by the applicable FAA standards.

3.2.3 Overlay Zones - Mixed Use Districts



3.2.2.3 Special District 3 - Active Military Use

Many parcels held by varying Federal and State military agencies, including the Navy, U.S. Coast Guard, and the Hawaiian National Guard, are designated as Special District 3 - Active Military Use. Development on these parcels is regulated by their respective charters and procedures.

3.2.3.1 Saratoga Overlay Zone

Properties within the Saratoga Overlay Zone are subject to the underlying Transect Zone, plus additional urban and architectural standards designed to ensure a pedestrian-scaled, lively streetscape. Active ground floor uses (such as retail) are required along Saratoga Avenue and Lexington Street within the Overlay Zone.

3.2.3.2 Gateway Overlay Zone

Properties within the Gateway Overlay Zone are subject to the underlying Transect Zone, plus additional urban and architectural standards designed to create defined, landscaped entry points to the community and/or the central business district of Kalaeloa. The Gateway Overlay Zone aligns along roads designed as Complete Streets, which also incorporate traffic-calming techniques throughout. The primary gateway intersections to Kalaeloa include Roosevelt Ave. and Kamokila Blvd.; Roosevelt Ave. and Wakea St. Extension; and, Roosevelt Ave. and Enterprise St.

3.2.4 Parking and the Transect

Understanding the physical requirements and constraints of parking through the entire Rural-to-Urban Transect profoundly affects the Rules. For example, the sheer land area required to meet parking requirements “on-site” are often too great to right-size the blocks and create a walkable urban environment. Overly large block dimensions resulting from “doughnut” solutions may affect street connectivity and walkability. In other words, in the case of parking, more is not necessarily better—in fact, it is often just the opposite.

One option to counter this, is the use of tartan street grids that intersperse larger blocks with smaller ones. Alternatively, if the financial resources are available, in T-4 and T-5 zones, a large deck surrounded with liner buildings containing active uses can be built at the outset of a project. Located at the center of a project, it can be used to handle overflow parking from neighboring blocks.

Robotic parking systems are another option, which consist of large computer-controlled, horizontal and vertical elevators that eliminate the space required for drive aisles and ramps as is the need for lighting, heating and cooling of a parking structure, reducing not only the space required for parking, but the operating and liability costs.



3.3 The Thoroughfare Network

3.3.1 Street Grid

The Plan envisions new streets to be woven into the existing grain of framework streets. The map depicted here in Figure 3-14 is conceptual in nature. It is expected that as each parcel is developed, streets may be added, subtracted or moved from where they are shown on this map. However the street network will be constructed to define blocks whose perimeters, measured as the sum of all sides, should generally not exceed: 3,000 ft in T3 Zones; 2,500 ft in T4 Zones; and 2,000 ft in T5 Zones. In addition, the street grid should have at least 150 vehicular street intersections per square mile in these zones. Within each block, service roads, such as alleys, lanes, and driveways, as well as pedestrian and bicycle only passages may be provided. The combined number of vehicular street and non-vehicular (pedestrian passages) intersections should exceed 300 per square mile.

LEGEND

Existing Street

Proposed Street

Proposed Emergency Access Road

Kalaeloa CDD Boundary



fig 3-14 Thoroughfare Plan

Future development should be designed such that new streets terminate at other streets forming a network or street-grid. Streets in new developments should connect to existing streets in existing development where at all possible. Cul-de-sacs should be minimized and used to accommodate specific site conditions only, not merely to prevent connectivity with more major streets. Internal Thoroughfares including private streets and drive aisles in shopping centers should also form part of the street grid. Drive aisles in parking lots should be designed to meet the standards of City of Honolulu streets (with appropriate sidewalks and streetscape) so that parking fields can be converted to blocks with the drive aisles as streets.

3.3.1.1 Large Lots

It is anticipated that some development will occur on large Blocks or Lots with one or more Large Format Type buildings as part of the ensemble, particularly in areas used for logistics or light industrial. These blocks may exceed the recommended maximum perimeter block size. In such cases, internal thoroughfares including private streets and drive aisles in the parking lots of light industrial sites should also form part of the street grid. Therefore, drive aisles in parking lots should be designed to meet the standards of city streets (with appropriate sidewalks and streetscape) so that parking fields can be converted to blocks with the drive aisles as streets.

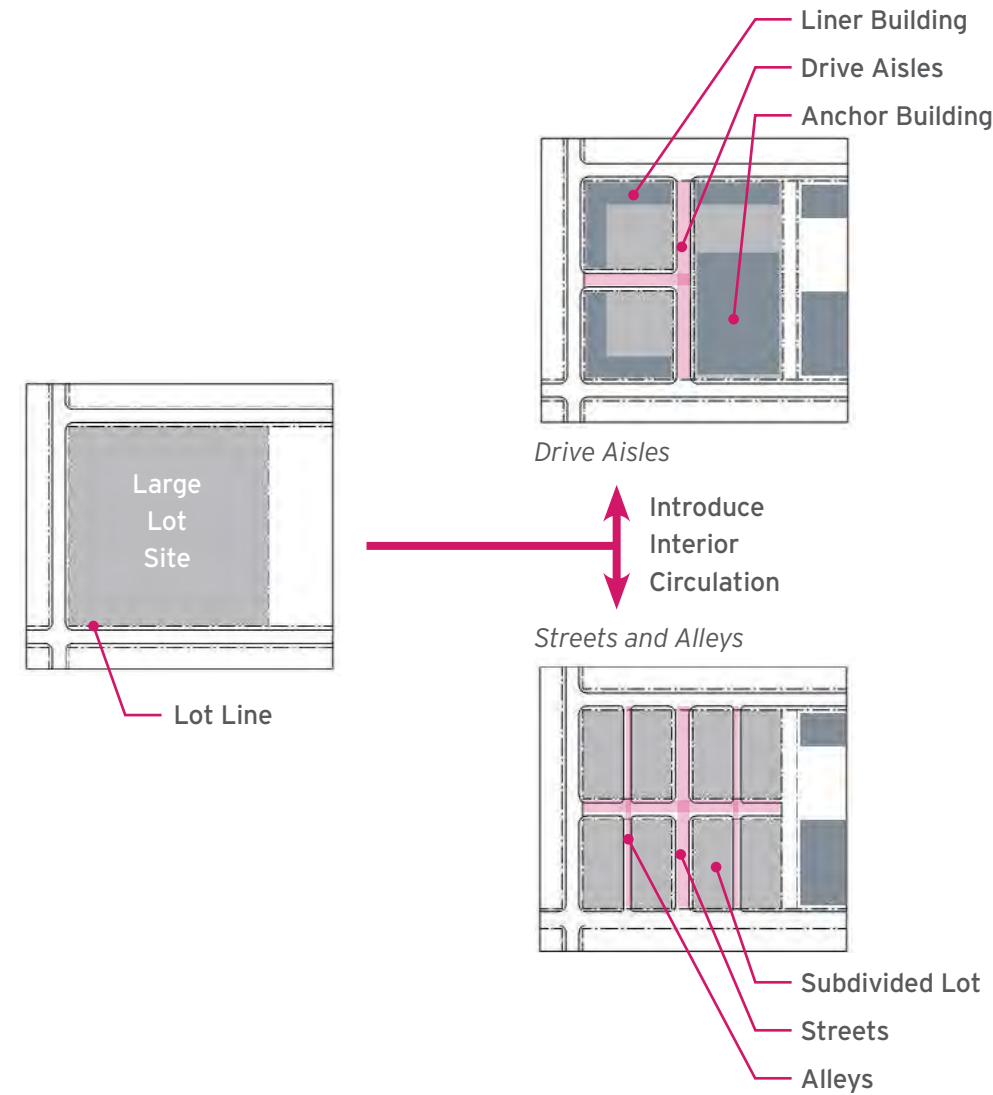


fig 3-15 Large Lot Development Diagram

3.3.1.2 Alleys

Alleys provide access to mid-block garages and service areas, thereby avoiding negative impacts of accessing garages and service areas directly from a street. Alleys are encouraged in all areas to eliminate the visual impact of garage doors, parking structures, and service areas along streets. Alleys are required: (1) where traffic volumes on streets that abuts a lot exceeds 3,000 average daily trips (ADT) (and curb cuts should be avoided), and (2) where development will front directly onto preserves, parks, and parkways (with no intervening street).

3.3.1.3 Bus Stops

Transit is an integral vision of the Kalaeloa Master Plan. Bus stops will be integrated into the streets of Kalaeloa, and this will be achieved in a uniform manner through clearly articulated curb bulb-outs, no parking zones, and unified street furniture. Bus stops should provide shade, seating, lighting, and trash and recycling receptacles. Photovoltaic (PV) panels should be considered for incorporation on bus shelter roofs to provide clean power.

Achieving Pedestrian Comfort through Intersection Density

A pedestrian is any person walking, skateboarding, using a wheelchair or other mobility device, or any other form of human-powered transportation other than a bicycle. Motorized wheelchair users are also considered pedestrians. Many of these modes primarily travel on sidewalks and other walking facilities. Pedestrians and bicyclists are often referred to as vulnerable users of roads because they do not have the protection provided by an automobile, though this can be improved by off-street trails or on-street separated bikeways. This is especially true for children, seniors, and those with disabilities, who may require additional time or unique information to use and cross roads safely. Creating places with enhanced Pedestrian Comfort is an important strategy in achieving the 20-minute city.

Intersection density is the number of intersections in an area. It corresponds closely to block size - the greater the intersection density, the smaller the blocks. Small blocks correlate with Pedestrian Comfort and walkable urban places because the short block size provides walkers with numerous opportunities to vary their route, to investigate interesting activities or features, and to shorten or lengthen their walk without retracing their steps along the same roads. In contrast, in hierarchical street networks with curvilinear streets and cul-de-sacs, walkers have fewer route options as opportunities to change direction are farther apart (and often out of sight around curves). In addition, such loop and cul-de-sac patterns typically require travel on an arterial road to reach geographically close locations. Though intersection density is just one facet of walkability, it is an important one.

Studies have found increased traffic collisions in neighborhoods with large arterial roadways. These designs are more dangerous for motorists as well as pedestrians and cyclists, when compared to pedestrian-oriented street networks, where frequent cross traffic encourages slower and more cautious driving. A study of 24 medium-sized California cities found that safer cities with 1/3 the traffic fatalities of less safe cities, had double the intersection density. Moreover, they had larger percentages of people walking, biking and using transit than less safe cities.

Intersection density also seem to play a role within a city not just between different cities. An analysis of Davis, CA showed that areas of town with the highest intersection densities, had half as many traffic fatalities as those areas with the lowest densities.

Research has shown that of all the built environment measurements, intersection density has the largest effect on walking – more than population density, distance to a store, distance to a transit stop, or jobs within one mile. Intersection density also has large effects on transit use and the amount of driving. In other words, intersection density is the most important factor for walking and one of the most important factors for increasing transit use and reducing miles driven.

Finally, research indicates that higher street intersection density has environmental benefits. People living in neighborhoods with higher street intersection density tend to drive less and walk and take transit more, all the hallmarks of the 20-minute city.

| | Safer Cities | Less Safe Cities |
|--|-------------------|-------------------|
| Population | 56,719 | 59,845 |
| Population Density | 5,736 per sq. mi. | 2,673 per sq. mi. |
| Intersection Density | 106 per sq. mi. | 63 per sq. mi. |
| Mode Share | | |
| Driving | 84.1% | 95.8% |
| Walking | 5.4% | 1.7% |
| Biking | 4.1% | 0.7% |
| Transit | 6.6% | 1.7% |
| Total Road Fatalities per 100,000 Population | 3.2 per year | 10.5 per year |

Block Sizes Comparison

150 Intersections per Square Mile



15 Intersections per Square Mile



3.3.2 Thoroughfare Standards for Complete Streets

All new thoroughfares should be designed under the City of Honolulu’s “Complete Streets” policy. Streets should generally consist of vehicular lanes, and public frontages. Bicycle lanes will also be appropriate on some streets. Public frontages contribute to the character of the Transect Zone, and includes the types of sidewalk, curb, planter, bicycle facility, and street trees. Streets should be designed in context with the urban form and desired design speed of the Transect Zones through which they pass. Streets may include vehicular lanes in a variety of widths for parked and for moving vehicles, including bicycles. Within Transect Zones T3 through T5, pedestrian comfort shall be a primary consideration of Street Design. Design conflicts between vehicular and pedestrian movement generally shall be decided in favor of the pedestrian.

To discourage fast, cut-through traffic, traffic calming measures should accompany the interconnected street network called for in these standards. A large measure of traffic calming would be provided through the use of appropriately dimensioned travel and parking lanes. (Excessive street width has been identified as a major contributor to higher vehicle speeds and a higher incidence of severe injuries). Additional techniques may be employed to calm traffic further, for pedestrian safety and convenience.

3.3.2.1 Articulated Crosswalks

At crosswalks, visual and physical articulation signal the special needs of pedestrians to motorists. Articulation can be created through the use of special pavers and textured concrete. Besides forcing motorists to slow down, raised intersections place crosswalks at the same level as abutting sidewalks and signal that pedestrians take precedence.

3.3.2.2 Bulbouts

Bulbouts extend curbs and replace parking lanes. They are especially warranted at intersections and other pedestrian crossings, where they slow motorists, provide a pedestrian refuge, and reduce pedestrian crossing distances.

3.3.2.3 Curb Radii

To slow traffic and reduce pedestrian crossing distances at intersections, curb radii shall not be more than 25 feet at intersections between boulevards and in industrial areas, 15 feet at intersections between lanes, and 20 feet at all other intersections.

3.3.2.4 Circles

Traffic circles slow traffic while offering capacities for turning movements that usually exceed conventional four-way intersections. Circles can be small enough to be placed in the middle of typical intersections, or large enough to accommodate parking and handle complex intersection geometries.



3.3.2.5 Offset Intersections

Travel routes that force turns because of offset intersections, slow traffic and discourage cut-through traffic. For safety, intersections should be offset by at least 150 feet (offset intersections also provide special vista opportunities for parks, civic buildings, building entries, monuments, or exceptional architecture).

3.3.2.6 Landscaping and Lighting

Landscaping and lighting contribute to pedestrian comfort and a positive community identity.

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CHAPTER 4 IMPLEMENTATION

4.0 Implementation Overview

4.1 Infrastructure

4.2 Public Services

4.3 Financing

4.4 Governance

This chapter outlines four key components to the successful implementation of the Kalaeloa Master Plan (Master Plan): infrastructure, public services, financing, and governance.



4.0 Implementation Overview

The original Kalaeloa Master Plan was issued in 2006 and included a robust program of Implementation. Since that time, incremental progress toward buildout has occurred with the construction of the FBI regional headquarters in 2013 and most recently the Veterans Administration Outpatient Clinic (VA Clinic), scheduled to open in 2023. Several residential neighborhoods have been renovated and fully occupied while two charter schools have found their home in Kalaeloa. Rights-of-way for several thoroughfares have been acquired and roadways have been designed. Initial electrical infrastructure upgrades have been undertaken including the development of an Electrical Energy Report in 2018, the construction of the Enterprise Energy Corridor, and multiple solar farms with a combined capacity of up to 15MW by various landowners (*i.e.* DHHL, HCDA, and the Navy.) Off-site, Kapolei neighborhoods, including Downtown Kapolei, has blossomed and the first phase of the HART Rail line with its terminus roughly 1.5-miles from the site is expected to open in 2023.

Despite these successes, the bulk of what was expected to be developed and completed by 2025 has yet to begin construction. There are several reason(s) for this including lack of landowner coordination in governance and implementation, as well as lack of infrastructure investment. Upon the formal amendment of the Kalaeloa Master Plan and Rules, an Infrastructure Master Plan and programmatic Environmental Impact Statement should be undertaken.



4.1 Infrastructure

4.1.1 Public Dedication

The Master Plan anticipates that all future utility systems at Kalaeloa will be operated by local utility providers such as HECO, Kalaeloa Water Company, BWS, City Department of Environmental Services, Hawaiian Telcom, and others. Roads, drainage, water supply, and wastewater systems that are constructed will need to be designed to City standards as they will ultimately be conveyed to the City.

4.1.2 Thoroughfares

The Master Plan identifies the classification for each existing and proposed thoroughfare of the Master Plan. All thoroughfares, (except for private streets) are intended to be constructed to City of Honolulu standards; however, some existing thoroughfare rights-of-way (ROW) at Kalaeloa do not conform to said standards and will require the transfer of additional land to the City to expand the ROWs. The HCDA will lead the coordination of the construction of these thoroughfares with costs being borne by the public and private sectors according to the map in Figure 4-1. In accordance with City Ordinance Sec. 33A-1.3, traffic impact fees would be assessed on developers within Kalaeloa to provide regional transportation improvements.

4.1.3 Public Transit

There are two primary types of public transit proposed for Kalaeloa: expanded bus service and rail connection.

4.1.3.1 Bus Service

Bus service should be enhanced to link downtown Kapolei and the Kapolei Transit Center, as well as to the Kualakai - East Kapolei station of the HART rail line, providing high quality connections to Downtown Honolulu, among other locations. This would include improving existing route 415 of The Bus to 15-minute headways, as well as adding two routes, one that runs the length of Saratoga Ave and another that runs along Coral Sea Road, both with 15-minute headways during peak periods, too.



4.1.3.2 Rail Service

Rail service, either as an extension of the HART rail line or as a light rail transit (LRT) line, that would link the Kualakai - East Kapolei Station to a Kapolei terminal station.

The 2006 Master Plan envisioned the extension running in a center median along Saratoga Ave. This is an appropriate route if designed as a LRT and in a manner consistent with a pedestrian-oriented environment. Another alternative is for an extension of the HART line’s existing technology of aerial trains. Because of columns needed to elevate the tracks, this route is recommended to be shifted to the Roosevelt Avenue ROW. This alternative has the advantage of providing faster service, higher capacity, and would likely serve a greater number of people in total.

While consideration of either route may seem far off as the City continues to build out the original route, both alternatives should be factored into future infrastructure planning. To the extent that existing environmental impact statements would have to be modified, such advanced planning is appropriate.

4.1.4 Drainage

Managing drainage during implementation of the Master Plan is two-fold: regional drainage from the mauka watershed that flows into Kalaeloa and run-off within Kalaeloa. In June 2017, the R.M. Towill Corporation (RTMTC) produced a drainage report of Kalaeloa that was commissioned by the Hunt Development Corporation that addressed both of these issues. The recommendations below represent key elements of that master plan, however, it is strongly recommended that a comprehensive drainage plan for all of Kalaeloa be undertaken for the construction of a robust stormwater conveyance system to replace existing, sanctioned and unsanctioned modes of stormwater collection throughout the District.



4.1.4.1 Regional Drainage

RTMTC recommends regional drainage improvements to channel offsite runoff from the Kapolei Village watershed and prevent flooding within Kalaeloa during large storm events. The existing four 6-foot x 4-foot box culverts that convey offsite flows from the lower channel/basin to the NASBP coral pit under Roosevelt Avenue are proposed to be demolished and upgraded to three 9-foot x 10-foot box culverts. The proposed box culverts are designed to accommodate a peak flow rate of 3,900 cubic feet per second (cfs) entering Kalaeloa from the Kapolei Village watershed. The proposed box culverts will provide adequate freeboard to meet City Storm Drainage Standards and alleviate the flooding that currently occurs in the vicinity.

The NASBP coral pit is an integral part of the regional drainage system design for Kalaeloa because it captures and disposes of all offsite runoff from the Kapolei Village watershed and there is no outlet to the Pacific Ocean. A total runoff volume of 1,150 acre-feet enters the coral pit from the Kapolei Village watershed and onsite areas within Kalaeloa. The volume of runoff from the Kapolei Village watershed and areas within Kalaeloa under the proposed condition is not expected to change. The resulting excess capacity of the NASBP coral pit is estimated to remain at approximately 243 acre-feet. Any future use of the NASBP coral pit must receive all appropriate permits and clearances.

4.1.4.2 On Site Drainage

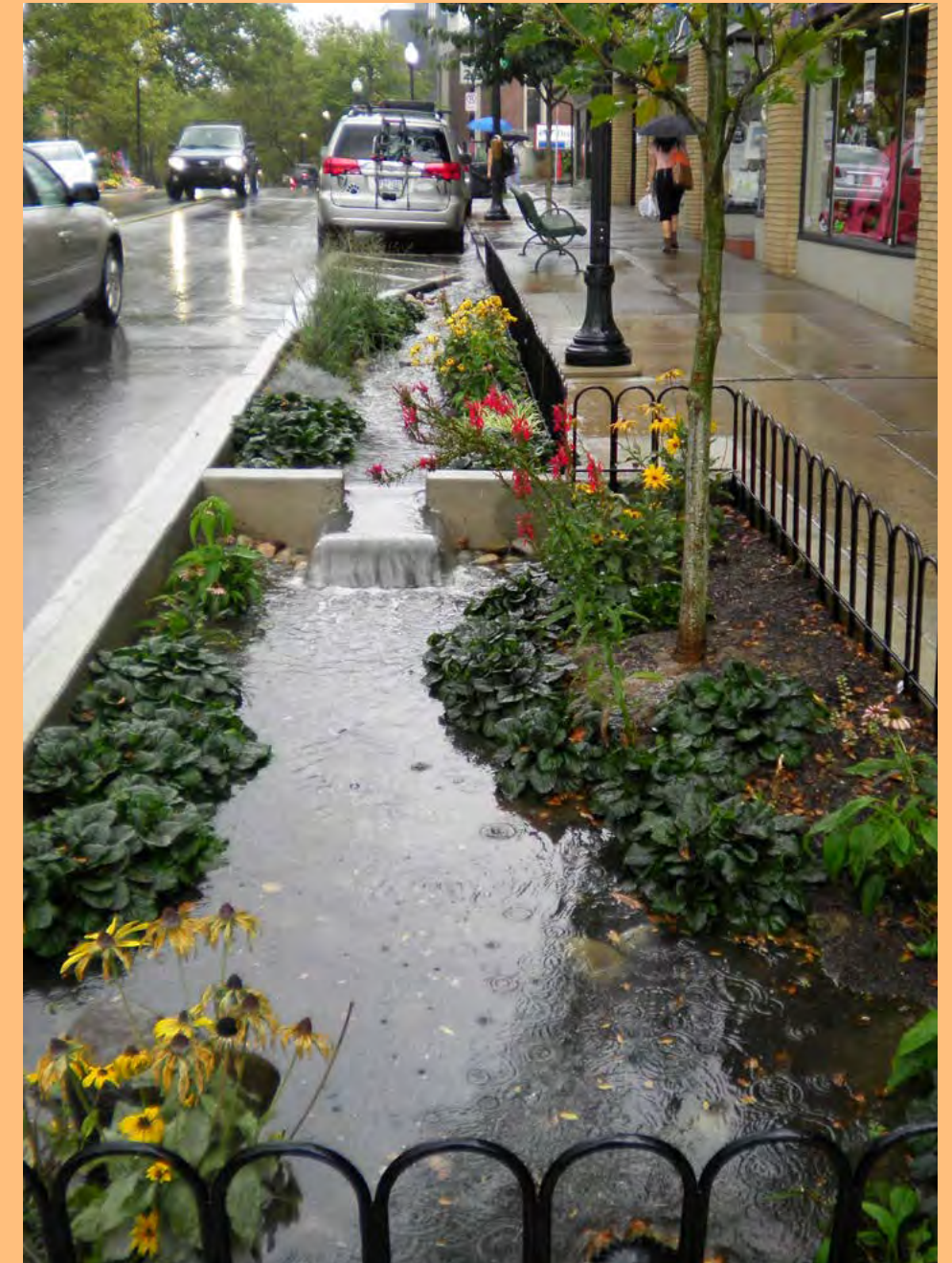
RTMTC recommends that drainage areas within Kalaeloa continue to follow the existing drainage patterns during large storms exceeding the capacity of the proposed onsite drainage facilities and no other regional type of drainage facilities are required.

The storm drainage system within Kalaeloa was broken up into three basic areas: 1) large existing sump areas, 2) developable parcels, and 3) areas within the proposed HCDA/City of Honolulu right-of-way.

- **Existing Sump Areas.** The large existing sump areas will remain in place, with the exception of one, which is proposed for development but will be replaced by two drainage basins. Proposed City roadways and parcels will be served by a backbone drainage collection system consisting of roadway catch basins and underground drain culverts that convey runoff to existing sumps or proposed retention basins located in Kalaeloa. Existing parcels not planned for development will be served by the backbone drainage collection system where possible. The remaining existing parcels will continue to follow the existing drainage patterns. The environmental advantage of maintaining the sump areas as part of the drainage plan is that using the existing sumps as percolation/retention basins to hold the 100-year, 24-hour storm event will exceed the City of Honolulu storm water quality standards.

- **Developable Parcels.** Parcels not accommodated by the proposed backbone drainage collection system will be required to provide private drainage systems to collect and retain all runoff increases generated within the parcel from development. Existing parcels not planned for development will continue to follow the existing drainage patterns.
- **Rights of Way.** Proposed City roadways not accommodated by the backbone drainage collection system should be collected by roadway curb cut drain inlets and discharged into drywells onsite. However, at present, the City does not have a standard that allows curb-cut inlets being routed to rain gardens and if a roadway is built with curb-cuts, it will be owned and maintained by an association. In instances where curb cut inlets are being utilized, the runoff collected by the curb cut inlets should be routed to rain gardens in the roadway shoulder that will serve as a best management practice (BMP) for treating the collected storm water. **This is a key component of the Kalaeloa sustainability strategy.** The types of BMPs recommended for the roadway drainage system is summarized as follows:

- **Rain Gardens:** provide treatment of the standard 1-inch design storm - including effective sediment and refuse removal, while reducing peak flows and alleviating runoff volumes through infiltration. They are fed by curb cut inlets and are fairly low maintenance, which can be performed by a landscape crew. After the vegetation establishment period, it typically consists of bi-annual removal of debris and mulch replacement.
- **Sediment Manholes:** protect the long-term function of dry wells (see below), by providing effective sediment and debris removal from runoff during larger storm events (greater than 1-inch). They collect bypass and overflow from the rain garden, via curb inlet. Treated runoff is then conveyed to a dry well via an overflow pipe at a higher invert. Maintenance is similar to standard catch basin maintenance requiring a vac-truck to remove debris from manhole, as needed.
- **Dry wells:** retain and infiltrate anticipated runoff generated in the right-of-way during a 10 year, 1-hour design storm. They receive treated stormwater runoff directly from the sediment manhole. Inspection should be conducted during routine maintenance of sediment manholes to ensure that there is no sediment build up. If the sediment manhole is functioning and maintained correctly, no maintenance is expected within the drywell.



4.1.5 Potable Water

In September 2016, RMTC prepared the Draft Kalaeloa Potable Water Master Plan for HCDA. This master plan identified the need for Kalaeloa’s water system to be improved and expanded to meet BWS Standards and to accommodate anticipated future water demands, the latter of which is expected to triple over current usage to 3.266 million gallons per day (mgd). This increase in demand is predicated due to new housing units being constructed at Kalaeloa, but is mitigated by HCDA’s mandate to utilize reclaimed or non-potable water for irrigation. However, the RMTC plan, assumed a buildout that was less than the maximum buildout that would be allowed. The plan applies a land utilization factor to parcels to account for site conditions such as topography and previously identified areas of cultural or biological significance which limit development to less than maximum permitted densities. It is important to reassess those buildout assumptions to ensure that the demand estimates in the 2016 RMTC plan are still applicable. It is also recommended that the 2016 plan be reviewed and updated as necessary to reflect any other changes in existing conditions, updated assumptions, or operational issues that have been made since the system was acquired by the Kalaeloa Water Company (KWC).

The RMTC plan (2016) also states that:

The anticipated 3.226 mgd demand is higher than the present 2.337 mgd water allocation for the Barbers Point Wells. Additional water source of 0.930 mgd must be requested from the BWS in order to accommodate the increase in water demand for ultimate development. Another option would be to petition the Commission on Water Resources Management to increase the Barbers Point water allocation. (p. 8-1)

The RMTC plan also advises that the “request for 0.930 mgd of average daily flow is sizeable” and requests for water service should be made by HCDA after approval of this Kalaeloa Master Plan amendment. While the water may not be required immediately, the request will allow KWC to evaluate their water resource situation and determine if water can be made available from the existing system or if additional water wells need to be drilled and permitted. If additional wells need to be drilled and permitted, the request for water may require negotiation between HCDA and BWS. Therefore, development and operation of the potable water system will be under the auspices of KWC in accordance with the Honolulu BWS standards. Major components of the system will include source, storage, and transmission.

It is proposed that none of the existing Navy lines be incorporated into the water system on a permanent basis, primarily because these lines are about 50 years old and are generally too small to service the planned densities. Indeed, the RMTC plan (2016) states that:

With the exception of the 24-inch line from the wells to Kalaeloa and along Roosevelt and Enterprise and the 18-inch line along Roosevelt and Coral Sea, most of the existing water lines in Kalaeloa do not have sufficient capacity to meet existing and projected fire flow requirements and are proposed to be removed or abandoned. (p. 8-1)

For full buildout of the Plan to be realized, water will need to be obtained from KWC, who will only provide service to portions of the water system where the water lines have been upgraded to meet BWS standards. It should be noted that since assuming ownership of the water system, KWC has made significant improvements to the existing water lines, reducing water loss by half. In order to receive a permanent water allocation, KWC will require the payment of facilities charges and a commitment to discontinue the use of potable water that is used for irrigation when non-potable water becomes available. This will require the construction of a separate non-potable water system as the water system is upgraded to meet BWS standards. Developers at Kalaeloa will be required to pay Hawai’i facility charges prior to connecting to the water

system. KWC will also award “credits” to HCDA for water infrastructure improvement expenditures.

The RMTC plan states that the existing water wells are in good condition, but the existing reservoirs will need to be renovated and additional reservoir capacity of 3.75 million gallons will be required. The existing water well and reservoir site is the preferred location for the new reservoir. Due to the site constraints, this location must be thoroughly investigated.

KWC has agreed to provide interim water to the Kalaeloa area from a master meter off Kamokila Boulevard to facilitate the development of parcels located between Roosevelt and Saratoga Avenue. As the water distribution system is brought up to BWS standard, additional parcels can receive KWC service. During the conversion from the original system to BWS Standard water lines, the water systems may have to be operated separately. Fire protection for industrial parcels will have to be provided by the original system during the transition.

For existing Kalaeloa developments that disconnect from the Navy water system and connect to the proposed KWC system, either master meters or individual building meters could be installed, depending on the situation. If master meters are used, the owner of the system served by the meter would be responsible for billing individual users and paying the KWC for water supplied through the master meter.

4.1.6 Reclaimed (Non-Potable) Water for Irrigation

The BWS has been developing a supply of reclaimed water for irrigation use. BWS owns the R-1 facility. Secondary effluent comes from CCH-ENV. Supply has been provided to the edge of Kalaeloa (referred to as “purple pipe”.) Although R-1 is currently flowing, it is estimated to be approaching capacity. However, these lines will need to be extended into the site to individual parcels, to provide non-potable water for irrigation of parks and other common landscaped areas as well as any agricultural use. This can be achieved after the City provides more supply. The details of this system have been described as part of the Non-potable Water Master Plan.

In December 2016, RMTC prepared the Draft Kalaeloa Non-Potable Water Master Plan for HCDA, based on buildout projections at the time. The RMTC plan concluded that there will be an increase in demand for reclaimed water to 1.583 mgd or 2.5 times current usage (which at present is limited to the Barbers Point Golf Course) to achieve the full development of Kalaeloa. However, the RMTC plan assumed a buildout that was less than what was allowed, by applying a land utilization factor to parcels to account for site conditions such as topography and previously identified areas of cultural or biological significance, which limit development to less than maximum permitted densities.

The RMTC plan asserts that the existing Kalaeloa potable water system will require significant improvement to meet BWS Standards and to accommodate anticipated future water demands of an additional 0.983 mgd of non-potable water for ultimate development. The most appropriate source is the BWS R-1 Reclaimed Water System. RMTC proposed to use as much of the existing system when the lines are replaced. There presently is non-potable R-1 water available but new developments are likely to require additional R-1 water.



The BWS currently produces a supply of reclaimed water at their Honouliuli facility that exceeds its current commitments (including full buildout of the City of Kapolei) by 2.7 mgd. Moreover, this capacity is expected to increase when the City increases its secondary treatment capacity of the Honouliuli Wastewater Treatment Plant (scheduled completion in 2025) and the BWS expands its reclaimed water facility. Most of the current supply is allocated to existing developments.

The preliminary conceptual request for 0.983 mgd of average daily flow is sizeable and requests for non-potable water service should be made by HCDA after approval of the Kalaeloa Master Plan Update. While the non-potable water may not be required immediately, the request will allow the BWS to evaluate their non-potable water resource situation and work with the City on the expansion to the Honouliuli WWTP, to determine when additional non-potable water can be made available to the existing system or if new users must wait until additional water reclamation facilities are constructed.

The BWS has agreed to provide R-1 Non-potable water when it is available. For a private system, the R-1 Non-potable water will be provided by a meter off Kamokila Boulevard and where Roosevelt Avenue meets Geiger Road. As KWC brings the potable water distribution system up to current standards, it would be most cost-effective if the non-potable system were upgraded at the same time so that additional parcels can receive KWC potable and BWS non-potable water. During the conversion from the original system to KWC standard water lines, the dual water systems may have to be operated separately.



SOURCE: Board of Water Supply, City and County of Honolulu, March 2021

The replacement of the existing water lines as identified in Section 4.1.5, above, may provide the opportunity to rehabilitate the existing lines for non-potable water distribution. With the exception of the 24-inch line from the wells to Kalaeloa, along Roosevelt Avenue and Enterprise Street and the 18-inch line along Roosevelt Avenue and Coral Sea Road, (which may be used for the potable water system) most of the remaining existing water lines in Kalaeloa may be used for the non-potable water system if these pipes fall within the future road rights-of-way proposed by the KIMPU. The Navy has stated that these pipes are cast or ductile iron and it may be possible to rehabilitate these pipes. These pipes should meet the non-potable flow requirements and are proposed to be reused if they are within the ROW of the thoroughfares of Kalaeloa. However, since these pipes are currently owned by KWC, their rehabilitation and reuse would have to be coordinated with KWC. It would also be prudent to coordinate with Hunt Development (or its successors) and other large developers.

4.1.7 Sewer

In July 2016, RMTC prepared the Pre-Final Kalaeloa Sewer Master Plan for HCDA. The plan concluded that Kalaeloa's sewer system will require modifications and upgrades to accommodate anticipated future sewer generation.

Full development of Kalaeloa would significantly increase the wastewater generation average daily base flow from 0.35 mgd to 3.1 mgd. However, as in other utility reports prepared by RMTC, it assumed a buildout that was less than what was allowed, by applying a land utilization factor to parcels which limited expected development to less than maximum permitted densities. It is important to reassess those buildout assumptions to ensure that the demand estimates in the 2016 master plan are still applicable. It is also recommended that the 2016 sewer plan be reviewed and updated as necessary to reflect any other changes in existing conditions, updated demand assumptions, or operational issues since that time.

As part of this plan, a hydraulic analysis of the existing sewer system was undertaken and concluded that, except for one pump station located south of Kalaeloa Airport's runways, the existing pump stations in Kalaeloa do not have sufficient capacity to meet projected wastewater flow requirements and are proposed to be removed or abandoned.

One significant change to the existing sewer flow pattern is to discontinue the use of the 30-inch gravity line which conveys flow from the East and West sewer lines southward beneath Kalaeloa Airport's runways. Due to air traffic at the

airport, access to the sewer line is restricted and limited. In the proposed sewer system, wastewater from the East and West Sewer Lines will converge at the same location north of the airport, but will then be pumped northward towards Independence Road where it will be discharged into a 30-inch gravity line and be conveyed east to HLIWWTP.

All new sewage facilities including pumping stations and lines will be designed in accordance with KWC and City's standards. Pumping stations will require a large concrete dry pit for housing the pumps, a building over the pit for ancillary equipment, and a separate room for a standby generator. Where such stations are visible from the public realm, they should be heavily screened with landscaping or provided with design details that relate to the architecture of the area. Developers at Kalaeloa will be assessed sewer facility charges by the City for offsite wastewater transport, treatment, and disposal. Therefore, it is recommended that a sewer master plan be prepared and submitted to the City for approval.

Recognizing the arid climate of Kalaeloa and the value of water as a resource, the RMTC plan recommends the recycling of water from wastewater treatment facilities for beneficial reuse in irrigation, industrial reuse, groundwater recharge, and indirect potable reuse. To that end, RMTC recommended use of a scalping plant, which is a smaller decentralized wastewater treatment facility which extracts wastewater from a trunk sewer and removes solids and impurities to produce reclaimed water for reuse. A scalping plant is capable of providing comparable treatment (secondary or tertiary levels)

to centralized wastewater treatment plants (WWTP) within a smaller facility. Solid waste generated at the scalping plant would typically return to the sewer system for conveyance to a larger centralized WWTP. While scalping plants can take up considerable land, a common treatment process considered for scalping plants is the use of membrane bioreactors (MBR) which provide tertiary quality water with a much smaller footprint compared to conventional treatment methods. MBRs can replace conventional secondary clarifiers and sand filters with a single process tank. The small footprint and single tank construction are often amenable to sites utilizing scalping plants. However, MBRs typically have high capital and operating costs.

Alternatively, more conventional scalping plants might be considered on lands owned by HCDA that are otherwise not suitable for significant development because of the proximity to the runways. A scalping plant requires less land than a typical WWTP since there is no treatment of solids onsite.

4.1.8 Electrical

Given the scope of the Master Plan, the existing electrical system in Kalaeloa will need to be upgraded. An agreement with HECO is recommended to assure that improvements to the electrical distribution system serve the increased development in Kalaeloa. As the detailed planning for each development project occurs, specific power requirements will be identified that can allow HECO to determine the work required to provide electrical service. Developers will be required to:

- Complete their own infrastructure design to show what infrastructure is needed to support HECO's system. HECO must approve the developer's design plans before installation can begin.
- While the developer is designing their construction plans, the developer must also reimburse HECO when they design what is needed to provide service for the project. Developers are responsible for coordinating HECO's design. HECO's design amount hovers around 20% of their overall project cost.
- The remaining 80% is to reimburse HECO for installing their service. This includes installing cable, transformers, switch pads etc.. It is then energized and provides actual service.

4.2 Public Services

4.2.1 Municipal Services

Police, fire, emergency medical services, and other typical municipal services are currently limited at Kalaeloa and divided between the City and the Navy, largely because the land conveyance process from the Navy to other entities has not yet been completed. This overlap in jurisdiction and ambiguity in land ownership creates difficulties in responding to public safety incidents and providing necessary municipal services. In its role as the redevelopment authority of Kalaeloa, the HCDA has the opportunity to be a convenor of all relevant parties to complete the process of land conveyance and other tasks related to the site’s redevelopment.

The Honolulu Fire Department has identified a need for a new fire station in Kalaeloa. Standard development procedures will ensure that a suitable location and facility are provided as Kalaeloa grows in the future.

4.2.2 Education

There are currently three schools in the Kalaeloa: Barbers Point Elementary School, Dreamhouse Charter School, and American Renaissance Academy. Adjacent to Kalaeloa in Kapolei, there are two more elementary schools, a middle school, and a high school with several other schools further afield but close to the CDD. Given the existing constraints at Barbers Point and Hookele Elementary Schools, the Department of Education has stated that one new elementary school will be necessary to meet the projected needs of the District.

Design enrollment guidelines for new elementary schools are eight to 15 acres of usable land and provide capacity for 400 to 750 students. Standard development procedures will ensure that a suitable location and facility are provided.

4.2.3 Parks

There are several parcels designated to be transferred to the City’s Department of Parks and Recreation. One of them is an approximately 220-acre assemblage along Saratoga Ave, tentatively known as Kalaeloa Regional Park - Mauka, which could someday have active recreational facilities such as basketball and tennis courts, baseball and soccer fields, and swimming pools. Should the transfer not take place, the HCDA and Navy should identify other public or private entities to develop park and recreational facilities for public use.

Another assemblage that includes the existing Kalaeloa Beach Park and Regional Park - Makai bracket both sides of Tripoli Road. The City’s Department of Parks and Recreation should undertake a master planning process for all future park properties with a robust community engagement component to properly plan for this extraordinary asset. There is a regional need for developed, programmed park spaces that provide sports courts, athletic fields, play structures, and aquatic facilities.

4.2.4 Trails

The HCDA should facilitate the commission of a Parks and Trails Master Plan by a local entity to guide the development of parks and trails in Kalaeloa. An historic trails plan should specifically be undertaken to provide public information on the cultural, historical, and environmental assets within Kalaeloa and provide public access to them, where culturally appropriate. Such trails plan should also cohesively connect to existing trails in the broader ‘Ewa region.



4.3 Financing

In the implementation of the Master Plan, private developers will finance new development for their projects and public agencies will finance new improvements on their lands. The remaining piece of financing is for the construction of new infrastructure and utility systems to serve public and private sector developments.

4.3.1 Grant Sources

The U.S. Department of Commerce’s Economic Development Administration (EDA), through its Public Works and Economic Development Facilities Assistance Program, provides funds for infrastructure improvements that promote economic development. Total EDA awards at other former military bases show that bases which attracted the most funding each received between \$8 and \$11 million.

Major roadways and improvements that support transit use or alternative modes of transportation may be eligible for other funding sources, particularly the pending legislation in Congress to replace or reauthorize TEA- 21 funding. These funds are typically provided through regional metropolitan planning organizations (MPOs). HCDA will work with the O’ahu MPO to secure available funds.

4.3.2 Bond Financing

The remaining cost of infrastructure improvements will need to be financed through bond issuances that, depending upon the type of bond, will be repaid either from assessments on property owners or tax revenues generated by new development at Kalaeloa. A range of bond tools can be used, but since repayment is based on new development, their use will be limited to infrastructure serving the new development enclave.

Financing for infrastructure improvements in lands owned by public agencies could be accomplished through state-issued general obligation bonds.

4.3.3 Hawai’i Community Development Authority Special Assessment Bonds

HCDA, subject to authorization by the Legislature, may issue and sell bonds to provide funds to finance public facilities that are backed by assessment on benefitting landowners. The salability of these bonds would likely be based upon the bond market’s confidence that the landowners directly affected by the improvements would be able to cover bond payments, regardless of the timing of new development.

4.3.4 Community Facilities District Bonds

The State has provided counties with the authority to issue Community Facilities District bonds that can be used to finance infrastructure improvements (HRS §46-80.1). Community Facilities District bonds are paid through assessments on future property owners and are thus backed by the property rather than the City. Community Facilities District bonds also require that the financed improvements be dedicated to the City.

One limitation of Community Facilities District bonds is that they tend to slightly reduce the sale prices and value of new development, in order to offset the additional assessments that property owners must pay. These bonds are backed by the bond market’s confidence in market conditions and the proposed development project, and thus may not be saleable until developers are selected.

4.3.5 Federal Infrastructure Funds

In 2021, President Biden signed the Infrastructure Investment and Jobs Act “to authorize funds for Federal-aid highways, highway safety programs, and transit programs, and for other purposes.” This Act and other subsequent funding legislation may provide opportunities to help finance certain infrastructure projects in Kalaeloa.

4.3.6 Tax Increment Finance Bonds

The State has authorized counties to issue Tax Increment Finance bonds that can be used to finance infrastructure improvements (HRS §46-101 et. seq.). A tax increment district is first established for an area to be redeveloped. As new development occurs, the incremental additions in property tax revenues that are generated (after deducting the costs of new municipal services such as public safety, public works, etc.) can be used to finance bonds.

This technique does not result in an increase in property tax rates, nor does it impact activities that are currently funded by existing property tax revenues in the tax increment district. Because Tax Increment Finance bonds are repaid from property taxes that new property owners have to pay, there is no potential impact on property values as there is with Community Facilities District financing.

The limitation of Tax Increment Finance bonds is that there must be an existing tax increment flow to finance bonds. This means that Tax Increment Finance bonds could not be used until later phases in Kalaeloa’s development.

4.3.7 Caveats and Limitations

The information used for the feasibility analysis is based on current market information. It should be considered illustrative rather than definitive. Financial analysis addresses whether development can profitably occur, but does not address whether there is sufficient market demand to sell or lease the proposed project.

Markets are dynamic, and a plan with a 20-year timeframe will experience multiple economic cycles. Interest rates, sales prices and lease rates, material costs, and other parameters will vary greatly during future economic cycles, and have a profound impact on project feasibility. Evaluation of project feasibility will need to occur throughout implementation of the Master Plan, and the eventual amount of any feasibility gap at any particular time may vary significantly from what has been projected here.

Cost assumptions, including those for land, infrastructure, and construction, are conceptual in nature. As further planning and development occurs, these costs may increase or decrease significantly from what has been modeled to date. More detailed implementation planning, with supporting financial analysis, will be needed.

4.4 Governance

At present, at least 16 public agencies and two private entities either own land or are designated to receive land in Kalaeloa once the base closure conveyance process has been completed. In base reuse efforts that involve multiple jurisdictions, having an effective governing authority and an efficient process for decision making that can bind all participants is essential for the success of the redevelopment effort.

Through its statutory authority, the HCDA has the ability to accelerate reuse through development entitlements, pursue the issuance of bonds to finance improvements, and assessment of properties as needed to fund Kalaeloa's management. As the successor to the former Local Reuse Authority (Barbers Point NAS Reuse Commission); HCDA has standing to work with the Navy on remaining base reuse issues. Therefore, in 2012, the State passed Chapter 215 of Title 15, Hawai'i Administrative Rules, entitled "Kalaeloa Community Development District Rules" and Chapter 216 of Title 15, Hawai'i Administrative Rules, entitled "Kalaeloa Reserved Housing Rules." These effectively act as the Zoning for the areas under its authority. As part of this Kalaeloa Master Plan amendment process, an update to these rules has been authored, requiring approval by the State Legislature and Governor.

However, given the multi-jurisdictional nature of Kalaeloa, HCDA cannot solely rely upon its statutory authority but must coordinate with the various entities within Kalaeloa in a manner that can facilitate implementation of the Master Plan. The federal government and state agencies own and operate many properties throughout the District and the HCDA acknowledges their regulatory supremacy.

Two other state agencies, in addition to the HCDA, have significant land holdings in Kalaeloa. The Hawaii Department of Transportation Airports Division (HDOT-A) owns and operates the airport. All development within 20,000 feet of the runways at JRF require HDOT-A and FAA review.

The Department of Hawaiian Home Lands (DHHL) owns numerous parcels constituting approximately 550 acres. These landholdings are a result of the 1995 Hawaiian Home Lands Recovery Act, Public Law 104-42, that was enacted by the United States Congress to settle claims against the Federal government for the loss of lands initially designated under the Hawaiian Homes Commission Act of 1921. Per the State Constitution, the Commission's land use authority is not subject to the counties or other State of Hawai'i agencies land use powers. Some of DHHL's land is suitable for residential or mixed-use development (consistent with its mission to provide homes for native Hawaiians), or it could be sold or traded with private entities to do the same. Providing transect zone categories for DHHL parcels encourages compatible development and ensures the community's needs and

desires are appropriately considered in future development possibilities and land transactions.

As stated, above, other entities also control significant land holdings and interagency coordination is critical if the Master Plan is to be successfully implemented.

There are several ways in which this coordination can occur, which involve varying degrees of formality. At the most informal level, agency-to-agency contact through meetings and written correspondence on a frequent basis can address many of the coordination issues involved in development planning and project implementation. When specific property maintenance or development agreements are necessary, more formal means of coordination are required. Depending upon the circumstances, a formal MOA or contract between parties may be warranted and can be negotiated in such a manner that conditions of the agreement are binding upon the parties.

Another method is the creation of a Kalaeloa Redevelopment Leadership Group consisting of the HCDA, DHHL, HDOT-A, and the Navy to seek major infrastructure development funding from federal and state sources. The funding and implementation of significant projects by this Leadership Group will incentivize further investment by other Kalaeloa land owners, catalyzing development in the District.

Led by the HCDA, this committee would meet regularly to do the following:

- Explore the transition and implementation challenges to create a shared problem framing. These challenges might involve changing the status quo.
- Reconnect the long-term & short-term. This committee would be asked to create specific tactics for moving forward, (e.g., solving the electrical grid hookup), identify fundamental changes and corresponding actions needed to reach the envisioned future. The ideas brought forward by the transition team would be summarized and published in a transition agenda.
- Engage and anchor the vision of the plan with relevant agencies, departments, and landowners to relate it to their own agenda and practices.
- HCDA should identify transition experiments: targeted short-term actions in line with the transition agenda with the intention of engaging more actors. Insights from these experiments can be implemented in future strategies.

The third, and most formal, mechanism for coordination is through the enactment of legislation. Depending upon the circumstances and the parties involved, legislation could be sought at the federal, state, or city level. Legislation should be considered when seeking funding or when there are structural changes in the authority or relationships between parties. Since such actions are subject to public debate and policy making, uncertainties exist in the process. Further, the timing required for the passage of legislation may adversely impact development phasing and implementation.



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