FILE COPY

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
REFUSE DIVISION
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APR - 8 2021

RICK BLANGIARDI
MAYOR

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DIRECTOR

MANUEL S. LANUEVO, P.E., DBIA, LEED AP
CHIEF

IN REPLY REFER TO:
RE 21-012

March 30, 2021

Mr. Keith Kawaoka, Acting Director
State of Hawaii, Department of Health
Office of Environmental Quality Control
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

Subject: Final Environmental Assessment (FEA) and Finding of No Significant Impact (FONSI) for the Kawailoa Transfer Station Improvements
Kawailoa Ahupua'a, Waialua District, O'ahu, Hawai'i
Tax Map Key (TMK): (1) 6-1-005:018 (por.)

Dear Mr. Kawaoka:

With this letter, the City and County of Honolulu, Department of Environmental Services (ENV) – Refuse Division hereby transmits the Final Environmental Assessment and Finding of No Significant Impact (FEA-FONSI) for the Kawailoa Transfer Station Improvements project situated at TMK (1) 6-1-005:018 (por.) located in Kawailoa Ahupua'a, Waialua District, island of O'ahu, for publication in the April 8, 2021 edition of *The Environmental Notice*.

Prior to this letter, ENV submitted the Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFONSI) document for the subject project to the Office of Environmental Quality Control (OEQC) which was published in the January 23, 2021 edition of *The Environmental Notice*.

ENV reviewed the comments and information received after the 30-day public comment period, and in light of the significance criteria in Hawai'i Administrative Rules, Section 11-200.1-13, finds that the proposed action would not result in significant adverse effects on the natural or human environment. We understand that publication of the FEA-FONSI will initiate a final 30-day review and judicial challenge period for the applicant's proposed action.

21-140

An unlocked, searchable PDF file of the FEA/FONSI and a zip file that contains the shapefile of the project location will be uploaded to the OEQC website along with this letter.

If there are any questions, please contact Mr. Josh Nagashima, Planner, ENV – Refuse Division by phone at (808) 768-3430 or by email at josh.nagashima@honolulu.gov, or our consultant from G70, Barbara Natale by phone at (808) 523-5866 or by email at KawailoaTS@g70.design.

Sincerely,

Manuel S. Lanuevo, P.E., DBIA, LEED AP
Chief

Enclosures

cc: Jeff Overton, G70
Planning and Engineering Branch

From: webmaster@hawaii.gov
To: HI Office of Environmental Quality Control
Subject: New online submission for The Environmental Notice
Date: Tuesday, March 30, 2021 6:47:37 PM

Action Name

Kawailoa Transfer Station Improvements Final Environmental Assessment

Type of Document/Determination

Final environmental assessment and finding of no significant impact (FEA-FONSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds

Judicial district

Waialua, Oʻahu

Tax Map Key(s) (TMK(s))

(1) 6-1-005:018

Action type

Agency

Other required permits and approvals

Special Management Area Use Permit – Major, Modification to Existing Solid Waste Management Permit, Grading, Grubbing, Trenching and Stockpiling Permits, Building Permits

Proposing/determining agency

Department of Environmental Services

Agency contact name

Gaudencio “Dennis” Lopez, P.E.

Agency contact email (for info about the action)

Gaudencio.lopez@honolulu.gov

Email address or URL for receiving comments

KawailoaTS@g70.design

Agency contact phone

(808) 768-3428

Agency address

1000 Uluohia Street
Suite 201
Kapolei, HI 96707
United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

G70

Consultant contact name

Jeff Overton

Consultant contact email

jeff@g70.design

Consultant contact phone

(808) 523-5866

Consultant address

111 S. King Street
Suite 170
Honolulu, HI 96813
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Map It

Action summary

Kawailoa Transfer Station (KTS) is owned and operated by the City Department of Environmental Services (ENV). ENV plans to provide a second loadout at KTS similar to other O‘ahu transfer stations, allowing for operational flexibility and reliability to support both refuse and green waste collection. Site improvements will be limited to the developed portion of the site. New construction will include extending the paved staging area to a new second loadout station; installing a new vehicle weigh scale, trench drain, and leachate holding tank at the existing and proposed loadouts; building a new mechanical/electric room; and adding a new 400 square foot office. Development of the site will involve vegetation clearing, minor grading and excavation,
paving and general construction. The second loadout will allow for green waste to be received and transferred separately, as well as provide a redundant loadout in the case of the first loadout failure.

Reasons supporting determination

Please see Chapter 6. Findings Supporting the Anticipated Determination.

Attached documents (signed agency letter & EA/EIS)

- KTS_Final-EA_3.30.21.pdf
- ENV-Kawailoa_FEA_Request-for-Publication-Letter_Draft-03252021_Final.PDF

Shapefile

- The location map for this Final EA is the same as the location map for the associated Draft EA.

Authorized individual

Barbara Natale

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

Kawailoa Transfer Station Improvements

FINAL ENVIRONMENTAL ASSESSMENT

KAWAILOA, O'AHU, HAWAI'I

APPLICANT:

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF ENVIRONMENTAL SERVICES

PREPARED BY:

element environmental llc
environmental · engineering · water resources

G70

APRIL 2021

Kawailoa Transfer Station Improvements

FINAL ENVIRONMENTAL ASSESSMENT

KAWAILOA, O'AHU, HAWAI'I

TMK (1) 6-1-005:018 (POR.)

APPLICANT AND APPROVING AGENCY:

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF ENVIRONMENTAL SERVICES
REFUSE DIVISION
1000 ULUOHIA STREET, SUITE 201
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APRIL 2021

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B. Final Cultural Impact Assessment for Kawailoa Transfer Station in Kawailoa Ahupua‘a, Waialua District, Island of O‘ahu, Keala Pono Archaeological Consulting, LLC., March 2021.

C. State Historic Preservation District Letter of Concurrence (March 11, 2021) and Final Literature Review and Field Inspection for Construction and Site Improvements at the Kawailoa Transfer Station, Kawailoa Ahupua‘a, Waialua District, Island of O‘ahu, Hawai‘i. Kleinfelder/GANDA, March 2021.

D. Final Traffic Assessment Kawailoa Transfer Station Improvements, Haleiwa, Oahu, Hawaii. Austin, Tsutsumi & Associates, Inc., March 2021.

Abbreviations

°F	Degrees Fahrenheit
ATA	Austin Tsutsumi & Associates
BMP	Best Management Practice
BWS	Board of Water Supply
CAB	Clean Air Branch
CIA	Cultural Impact Assessment
City	City and County of Honolulu
CR	Coral Outcrop
CUP	Conditional Use Permit
CY	Cubic Yards
CZM	Coastal Zone Management
DA	Department of Army Permit
dBA	Decibel
DBEDT	Department of Business, Economic Development, and Tourism
DLNR	Department of Land and Natural Resources
DOFAW	Division of Forestry and Wildlife
DOH	Department of Health
DOT	Hawai‘i Department of Transportation
DPP	Department of Planning and Permitting
DPS	Distinct Population Segment
EA	Environmental Assessment
ENV	Department of Environmental Services
EPA	Environmental Protection Agency
FONSI	Finding of No Significant Impact
HAR	Hawai‘i Administrative Rules
HCM	Highway Capacity Manual
HECO	Hawaiian Electric Company
HFD	Honolulu Fire Department
HPD	Honolulu Police Department
H-POWER	Honolulu Program of Waste Energy Recovery
HRS	Hawai‘i Revised Statutes
IBC	International Building Code

LOS	Level of Service
LUC	Land Use Commission
LUO	Land Use Ordinance
KTS	Kawailoa Transfer Station
kV	Kilovolt
MPH	Miles Per Hour
MSL	Mean Sea Level
MSW	Municipal Solid Waste
NAAQS	National Ambient Air Quality Standards
NHS	National Highway System
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NSSCP	North Shore Sustainable Communities Plan
ORTP	Oʻahu Regional Transportation Plan
POR.	Portion
PV	Photovoltaic
ROH	Revised Ordinances of Honolulu
RRR	Reduce Reuse Recyclers
SAAQS	State Ambient Air Quality Standards
SCP	Sustainable Communities Plan
SHPD	State Historic Preservation Division
SLR	Sea Level Rise
SLR-XA	Sea Level Rise Exposure Area
SMA	Special Management Area
SMP	Special Management Area Use Permit
SWM	Solid Waste Management
TAZ	Traffic Analysis Zones
TDFM	Travel Demand Forecasting Model
TIAR	Traffic Impact Analysis Report
TMK	Tax Map Key
UH	University of Hawaiʻi
UIC	Underground Injection Control
USDA	United States Department of Agriculture
USGS	United States Geological Survey

Section 1

Introduction

Chapter 1

Introduction

This Environmental Assessment (EA) has been prepared in accordance with the requirements of Chapter 343, Hawai‘i Revised Statutes (HRS) and Hawai‘i Administrative Rules (HAR), Title 11, Chapter 200.1, Department of Health (DOH), which set requirements for the preparation of environmental assessments. This EA is also prepared pursuant to and in compliance with Chapter 25, Special Management Area (SMA), Revised Ordinances of Honolulu (ROH), which provides for the regulation of land uses in the SMA. Kawailoa Transfer Station (KTS) and the proposed area of improvements are located within the SMA and will require the approval of an SMA Use-Major Permit application, which will review this EA as part of the application.

1.1 Project Information Summary

Type of Document:	EA
Project Name:	KTS Improvements
Recorded Fee Owner:	City and County of Honolulu (City) Department of Environmental Services (ENV) 1000 Uluohia Street, Suite 308 Kapolei, HI 96707
Applicant:	ENV, Refuse Division 1000 Uluohia Street, Suite 201 Kapolei, HI 96707 Contact: Gaudencio “Dennis” Lopez, P.E. Planning and Engineering Branch Chief Telephone: (808) 768-3428
Agent:	G70 111 S. King Street, Suite 170 Honolulu, HI 96813 Contact: Jeff Overton, Principal Telephone: (808) 523-5866
Approving Agency:	ENV, Refuse Division 1000 Uluohia Street, Suite 201 Kapolei, HI 96707 Contact: Gaudencio “Dennis” Lopez, P.E. Planning and Engineering Branch Chief Telephone: (808) 768-3428

Ch. 343, HRS Triggers:	Use of City Lands and Funds
Project Location:	62-180 Kawailoa Drive, Hale‘iwa, HI 96712 *(Figure 1.1)*
Tax Map Key (TMK):	(1) 6-1-005:018 (por.) *(Figure 1.2)*
Project Area:	Project Area: 0.63 acres Parcel Area: 28.32 acres
State Land Use District:	Agriculture *(Figure 1.3)*
City & County of Honolulu Zoning:	AG-1 Restricted Agriculture *(Figure 1.4)*
City Development Plan:	North Shore Sustainable Communities Plan *(Figure 5.1)*
Special Management Area:	A portion located within SMA *(Figure 1.5)*
Flood Zone:	Zone XS (Areas of 500-year flood plain or 0.2 percent Annual Chance of Flood) and Zone D (Undetermined Flood Hazard) *(Figure 1.6)*
Anticipated Determination:	Finding of No Significant Impact (FONSI)

1.2 Overview and Background

KTS is owned and operated by the City ENV. ENV plans to provide a second loadout at KTS similar to other O‘ahu transfer stations, allowing for operational flexibility and reliability to support both refuse and green waste collection.

Site improvements will be limited to the developed portion of the site. New construction will include extending the paved staging area to a new second loadout station; installing a new vehicle weigh scale, trench drain, and leachate holding tank at the existing and proposed loadouts; building a new mechanical/electric room; and adding a new 400 square foot office with restroom, shower and break area. The portable trailer currently used as an office will be moved from the staging area to another location within the transfer station yard and used for equipment storage. The security guard station will also be replaced. Development of the site will involve vegetation clearing, minor grading and excavation, paving and general construction. The second loadout will allow for green waste to be received and transferred separately, as well as provide a redundant loadout in the case of the first loadout failure.

KTS is on the same property as a closed landfill. In the early 1980s, the City understood that the capacity of the landfill would be reached in late 1984 or early 1985. Preparations were made for closing the landfill and replacing with a refuse transfer station located between the landfill entrance and the landfill. A majority of the landfill and a portion of the proposed (at the time) transfer station were within the SMA *(Figure 1.5),* requiring the application for a Special Management Area Use Permit (SMP). 84/SMA-78 and 84/SMA-80 were issued in March 1985 for the closure of the Kawailoa Sanitary Landfill and the construction of KTS.

Another permit was issued in March 1995 (94/SMA-77) for site improvements, including construction of access roads, installation of a computerized truck weighing system, and installation of a closed circuit television system. Other improvements included a metal roof shelter, fencing and grading. The refuse transfer station was considered a Utility Installation, Type A and is a permitted principal use within the AG-1 Restricted Agricultural District, therefore a City Conditional Use Permit (CUP) was not required. An EA was not required as the work was defined as part of Exemption Classes #1 and #2, Item 3, of the Comprehensive Exemption List for the City Department of Public Works, dated August 15, 1990.

In February 2003, 2002/SMA-55 was approved as a minor modification to 84/SMA-78. This permit approved modifications to the existing transfer station to better accommodate the collection and storage of green waste and the distribution of mulch. Improvements proposed included extension of the existing tipping area and a new office.

These improvements were not completed. Once the project was revisited, it was determined that the original proposed location for the green waste tipping station on the north side of the transfer station was not the best alternative. It would have required relocation of multiple utilities and caused conflicting traffic patterns on-site. The revised alternative location for the green waste tipping station on the east side of the transfer station is being analyzed here within this EA.

1.3 Purpose of the Environmental Assessment

This EA will comply with Hawai‘i’s Environmental Review process, HRS Chapter 343. The property is owned by the City, and will use City funds, both of which provide the basis for the preparation of this document.

This EA is also prepared pursuant to and in compliance with ROH Chapter 25, SMA, which provides for the regulation of land uses in the SMA. A portion of the proposed improvements are located within the SMA and certain improvements may require the approval of an SMP.

The City ENV is the approving agency. The EA examines the potential environmental impacts of the planned improvements at KTS and seeks agency and public comment on subject areas that should be addressed.

1.4 Agencies, Organizations and Individuals Contacted in Early Consultation

Agencies, legislators, and members of the community were consulted in the preparation of this EA. Early consultation letters were mailed to select agencies to review the scope of the project. Parties contacted in early consultation are listed below. Further information is detailed in Chapter 7.

Federal

- U.S. Army Corps of Engineers
- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS)
- U.S. Department of the Interior, Fish and Wildlife Service

State

- DOH Environmental Health Administration
- DOH Clean Air Branch (CAB)
- DOH Clean Water Branch
- DOH Environmental Management Division
- DOH Safe Drinking Water Branch
- DOH Solid and Hazardous Waste Branch
- Department of Land and Natural Resources (DLNR) Department of Forestry and Wildlife (DOFAW)
- Department of Transportation (DOT)
- Office of Hawaiian Affairs
- Office of Planning
- Senator Gil Riviere
- Representative Sean Quinlan
- Councilmember Heidi Tsuneyoshi

City and County

- Board of Water Supply (BWS)
- Department of Design and Construction
- Department of Facilities Maintenance
- Department of Planning and Permitting (DPP)
- Department of Transportation Services
- Honolulu Fire Department (HFD)
- Honolulu Police Department (HPD)
- Office of Climate Change, Sustainability and Resiliency

Organizations

- North Shore Neighborhood Board #27

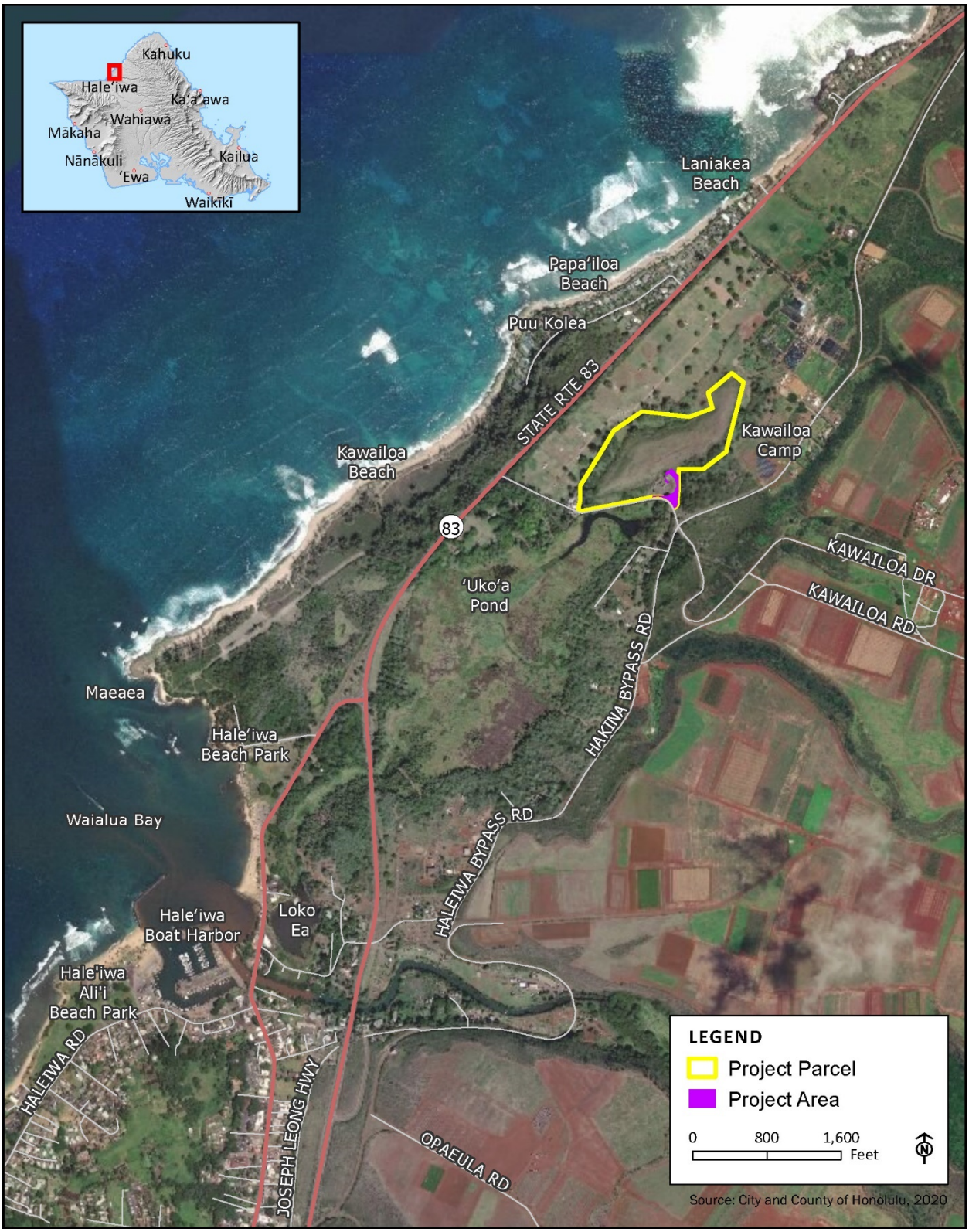

Figure 1.1 **Project Location**

Figure 1.2 **Tax Map Key**

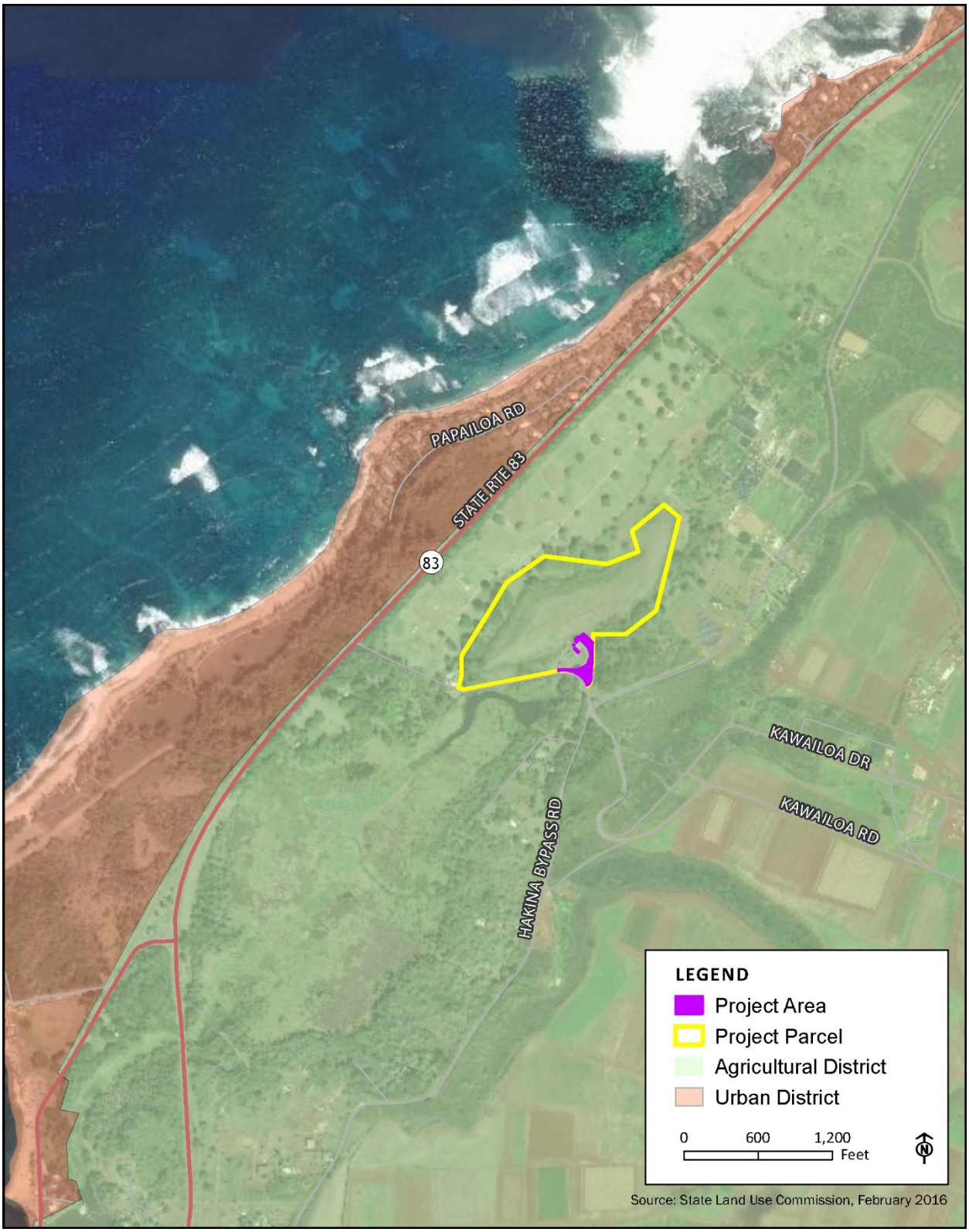

Figure 1.3 **State Land Use Classification**

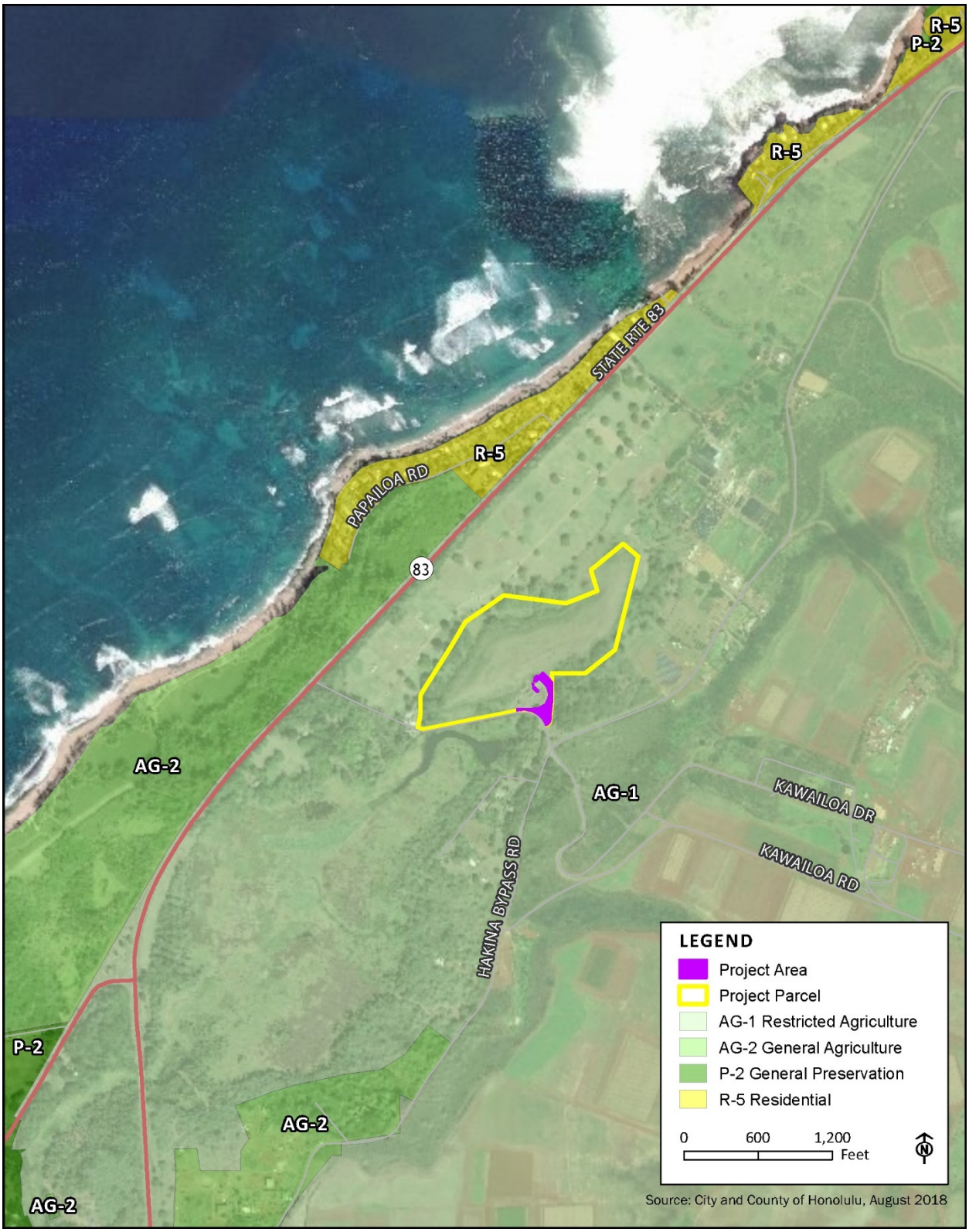

Figure 1.4 **City and County of Honolulu Zoning**

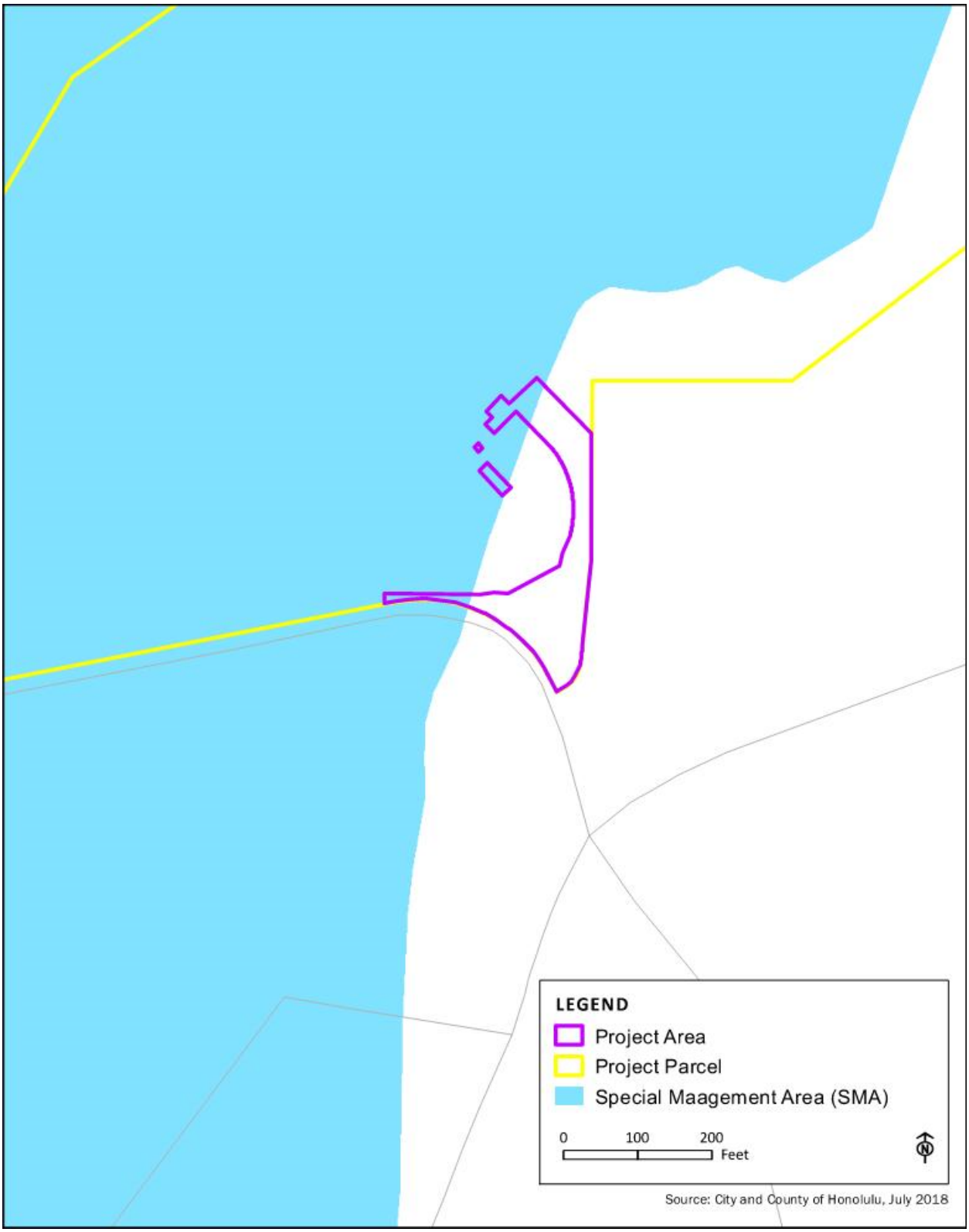

Figure 1.5 **Special Management Area**

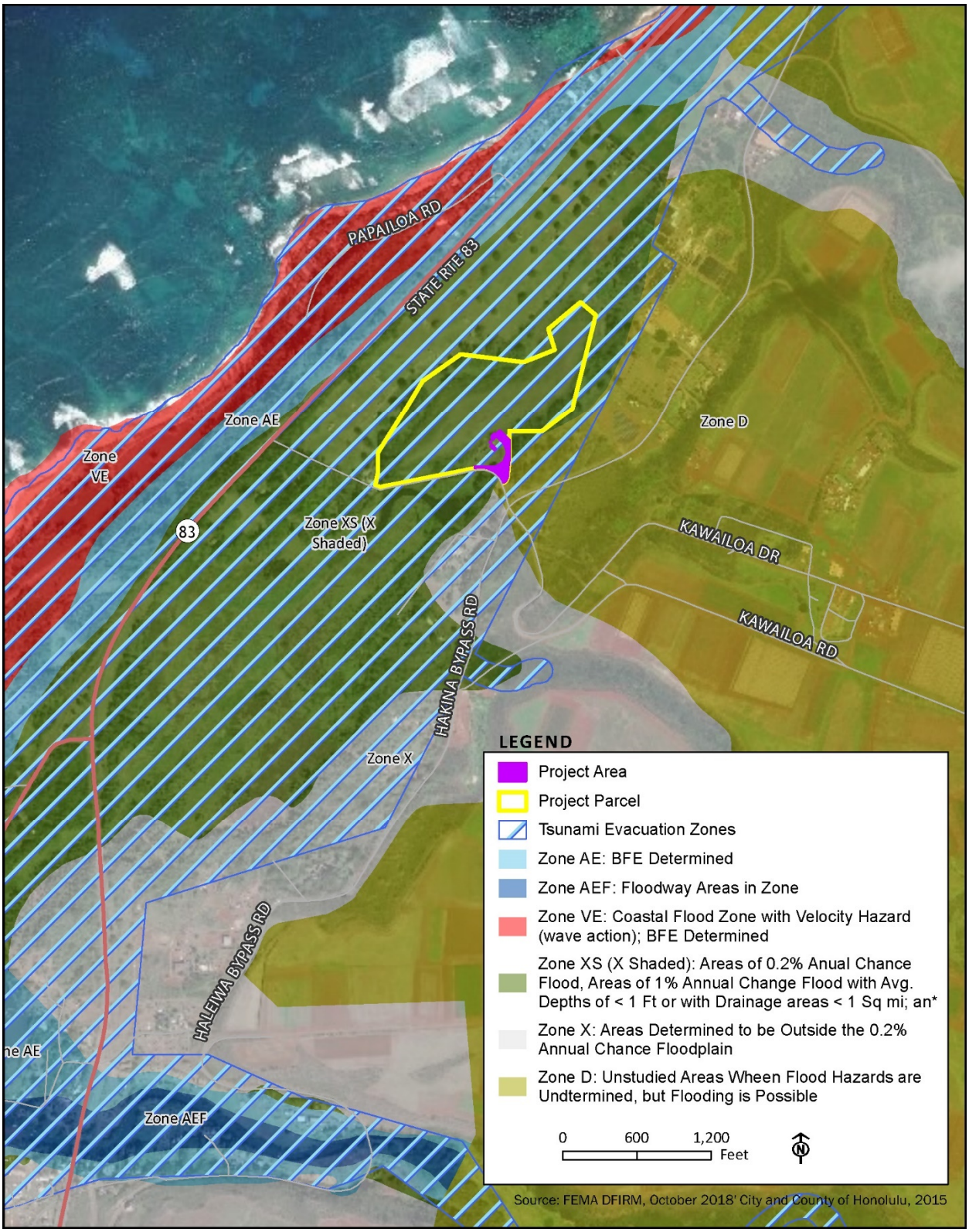

Figure 1.6 **Flood and Tsunami Evacuation Zones**

Section 2

Project Description

Chapter 2

Project Description

This chapter provides the history and existing uses of the property and surrounding areas. An overview of the planned improvements is provided.

2.1 Project Area Characteristics

The KTS Project site is located mauka of Kamehameha Highway (State Route 83) at 62-180 Kawailoa Drive, Haleʻiwa, Hawaiʻi *(Figure 1.1).* The property is identified as TMK (1) 6-1-005:018 and is owned, operated and maintained by the City ENV. The site is bordered by private property and accessed by Kawailoa Road, a public road, on its southern side. The road becomes private at the end of the facility. A public landfill capped in 1988 forms the site's western boundary. The property is partially located within the SMA as defined in HRS Chapter 205A and ROH Chapter 25 *(Figure 1.5).*

Driving distance along Kamehameha Highway to KTS is approximately one mile from Haleʻiwa and approximately four miles from Pūpūkea. The Turtle Bay Resort is located approximately eight miles from the transfer station toward Kahuku. The surrounding community between Haleʻiwa and Waimea Bay is a primarily low density residential area with numerous beach parks, open space and small-scale agricultural uses. Haleʻiwa, a popular tourist destination, is the nearest commercial center.

2.2 History of the Area

The lands located southwest of the existing Project site and across the boundary of Kawailoa Drive include the waters of ʻUkoʻa Pond. ʻUkoʻa Pond is considered a Traditional Cultural Property based on the traditional accounts of Laniwahine, the moʻo akua associated to the pond, as well as aliʻi who controlled fish production of the royal pond, specifically Kakuhihewa, Kamehameha I, and Laʻanui.

The ahupuaʻa of Kawailoa is located in the moku land district of Waialua. Waialua can be literally translated as "two waters" and may refer to the two large stream drainages (Anahulu and Helemano-Poamoho-Kaukonahua) that were once used to irrigate extensive taro fields in the ahupuaʻa of Kamananui, Paʻalaʻa, and Kawailoa. In the pre-contact period, villages in the Waialua district were concentrated along the coast and the well-watered valleys of the ahupuaʻa on the eastern side of the district.

Beginning in the early 1800s, the sandalwood trade initiated economic and cultural transformations in Waialua Moku. It was the strict monopoly of the aliʻi beginning with Kamehameha. The demands put on the makaʻāinana (commoners) to harvest wood for trade caused many taro fields to become fallow. As the sandalwood trade collapsed in the 1830s, Protestant missionaries began to establish their presence in Waialua.

The missionary John Emerson was the first to cultivate sugar in the Waialua area, growing sugar cane on his land from as early as 1836. Development of the Oahu Railway and Land Company (OR&L) railroad system to Waialua in 1898 spurred the development of large-scale sugar farming in Waialua.

By the end of 1898, the first cane crop, grown on 300 acres and harvested in 1899, produced 1,741 tons of sugar. By 1908 the new railroad connected the plantation lands in Waialua, Helemano, and Kawailoa. The population in the area grew as Chinese, Japanese, Korean, Portuguese, Norwegian, Scotsmen, and later Filipino laborers were conscripted to work at the expanding plantations. Waialua Agricultural Company, later named Waialua Sugar Company in the 1970s, continued to expand during the first decades of the 20th century, eventually operating on more than 12,000 acres, including a large portion of Kawailoa Ahupuaʻa which was leased from the Bernice Pauahi Bishop Estate.

Kawailoa became the site of one of the three camp units (the other two were Helemano and Waialua) into which the plantation was divided. Kawailoa Camp comprised of housing, social and recreational facilities for the workers of the adjacent fields and their families and was located mauka of the current transfer station on Kawailoa Road. The area which eventually became the landfill area was used for discarding unwanted bulk items and not actual refuse during the 1950s. The plantation camps, including the nearby Kawailoa Camp, had on-site refuse facilities.

Discarded bulk items would be piled together in the KTS area, forming little mounds that became "havens of treasures". The area was probably selected because of the proximity to the camp and rail line, as well as it being a demarcated area located out of public view. As such, useful discarded items would often be recycled, creating almost an informal "swapping area" of used goods and wares. Government records indicate that the lands of the Project site belonged to Bernice Pauahi Bishop Estate, and were used as a dump beginning in the mid-1950s, and later became a landfill in the 60s. A review of land assessment records indicates that a fee of condemnation was applied to the parcel in 1970, whereupon the land value at the time was estimated at approximately $3,000. The landfill closed in 1986, and site usage was shifted to a transfer station, which continues through present time.

2.3 Existing Conditions

KTS serves to consolidate waste from municipal solid waste (MSW) collection trucks (both manual and automated collection) into large transfer trailers for more efficient and economical transport to H-POWER (Honolulu Program of Waste Energy Recovery). The primary customers include collection trucks from the City's Lāʻie and Waialua Refuse Collection Yards and residential self-haulers. Residents may dispose of their MSW and drop-off other certain recyclable items at the transfer station for free; businesses and commercial users must pay a tipping fee.

Before the collection trucks dispose of their waste at KTS, they must first drive onto the vehicle scale to weigh their load *(Figure 2.1).* This allows the transfer station to keep track of the amount of waste that is brought in by the collection trucks, and could be utilized to quantify incoming self-hauled waste.

Green waste is not accepted for recycling at KTS, and these loads from both residents and commercial landscapers with green waste are redirected to Hawaiian Earth Recycling, the City's contracted green waste recycler, in Wahiawā. However, if incidental green waste is delivered to Kawailoa, it is hauled to H-POWER along with the normal trash.

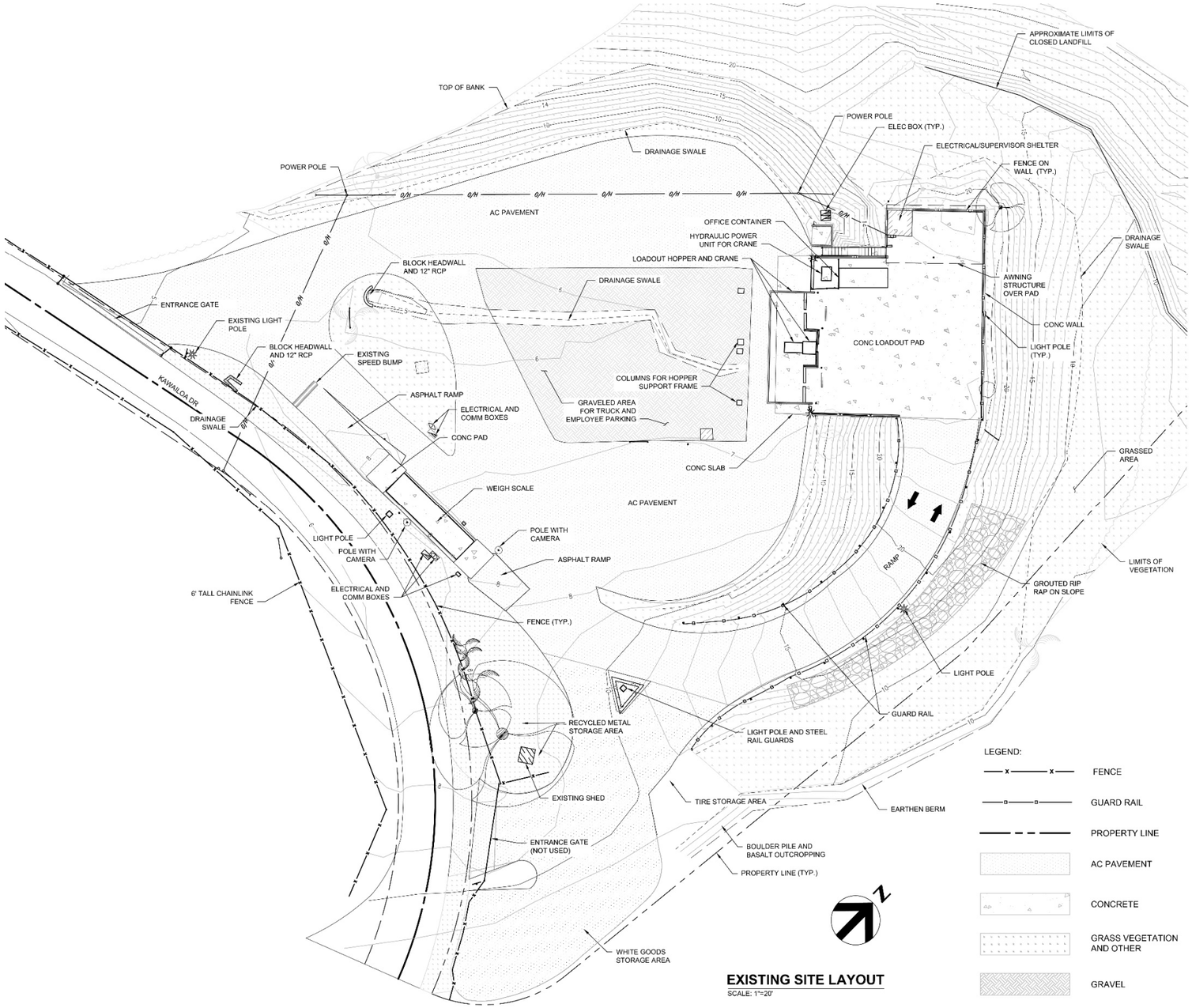

Figure 2.1 **Kawailoa Transfer Station Existing Conditions**

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KTS has a permitted capacity of 29,200 tons per year of MSW (or 80 tons per day). Residents can bring refuse such as plastic bags of trash, drywall, glass, lumber, mattresses, furniture, small appliances, paper, cardboard, cloth, plastic, roofing material, rugs and carpeting. Examples of acceptable material for the metal bin include barbecue grills, bicycles, fencing, pipes, gutters, ladders, lawn tools, metal shelving, and tire rims. Separate storage areas are provided for white goods (appliances), tires, auto batteries, propane tanks, fire extinguishers, and recyclables *(Figure 2.2).* Industrial waste and hazardous waste are not accepted.

Trucks transport the trailers of MSW to the H-POWER waste-to-energy facility where it is burned to create energy. Schnitzer Steel processes and exports both ferrous and non-ferrous scrap metal. White goods are taken to the Enhanced Materials Recovery Facility in Kalaeloa to be processed by Island Recycling, which reclaims the refrigerant and recycles the metals. Retired Tires Hawaii ships tires overseas for recycling. Mixed recyclables deposited into several 96-gallon blue carts located at the center of the transfer station are taken to Reduce Reuse Recyclers Hawaii LLC (RRR). RRR processes the City's material and materials from other accounts and then markets the material to overseas end users.

2.4 Description of the Proposed Action

The City ENV intends to improve the KTS with a new loadout to accommodate green waste recycling and redundancy. This Project provides a second loadout area to supplement the sole loadout area currently in existence. The added loadout area will allow for operational flexibility and reliability, and provide a second loadout area similar to the other transfer stations.

Access to the Project site will continue to be provided via the existing driveway along Kawailoa Drive. The Project is anticipated to be completed by the year 2022.

Figure 2.3 depicts the conceptual site plan for the expanded transfer station. Site improvements will be limited to the developed portion of the site. The general elements of the plan consist of the following programmed areas:

- Facility Manager's Office with teller area, breakroom, and restroom with a shower *(Figures 2.4, 2.5);*
- New Mechanical/Electrical Closet;
- Expanded Tipping Area including a new transfer trailer receiving bay to allow for segregation of green waste;
- A new vehicle weigh scale, trench drain, and leachate holding tank within the existing transfer trailer receiving bay and the new Expanded Tipping Area; and
- Paved parking, staging and circulation areas.

The Project involves the replacement of the existing portable office trailer with a new 400 square-foot Facility Manager's Office. This building will include office space, teller area, breakroom, and restroom with a shower. A new mechanical/electrical closet will be built adjacent to the Office. A wastewater holding tank will be used instead of an individual wastewater system, as the water table in this location is shallow. The holding tank will be situated in the location of the current portable toilet, next to the stair entry. Solar hot water panels will be installed to heat water supplied to the sink and shower, and additional photovoltaic (PV) panels will be installed to offset some electrical usage for the building. The solar hot water panel and electrical PV will be constructed over the roof of the new Facility Manager's Office. The Office will extend past the existing floor area with support from a retaining wall.

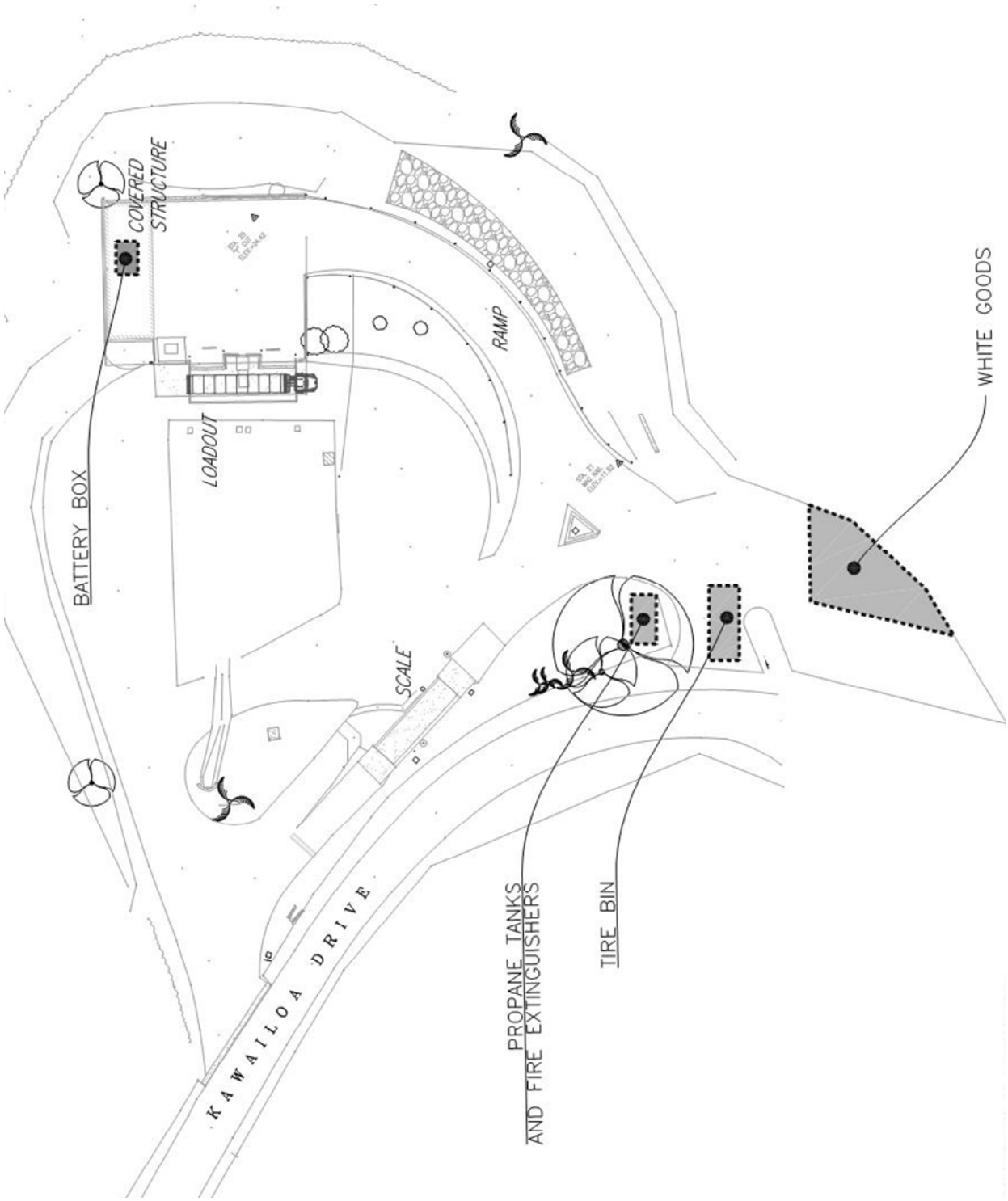

Figure 2.2 **Kawailoa Transfer Station Existing Solid Waste Bin Locations**

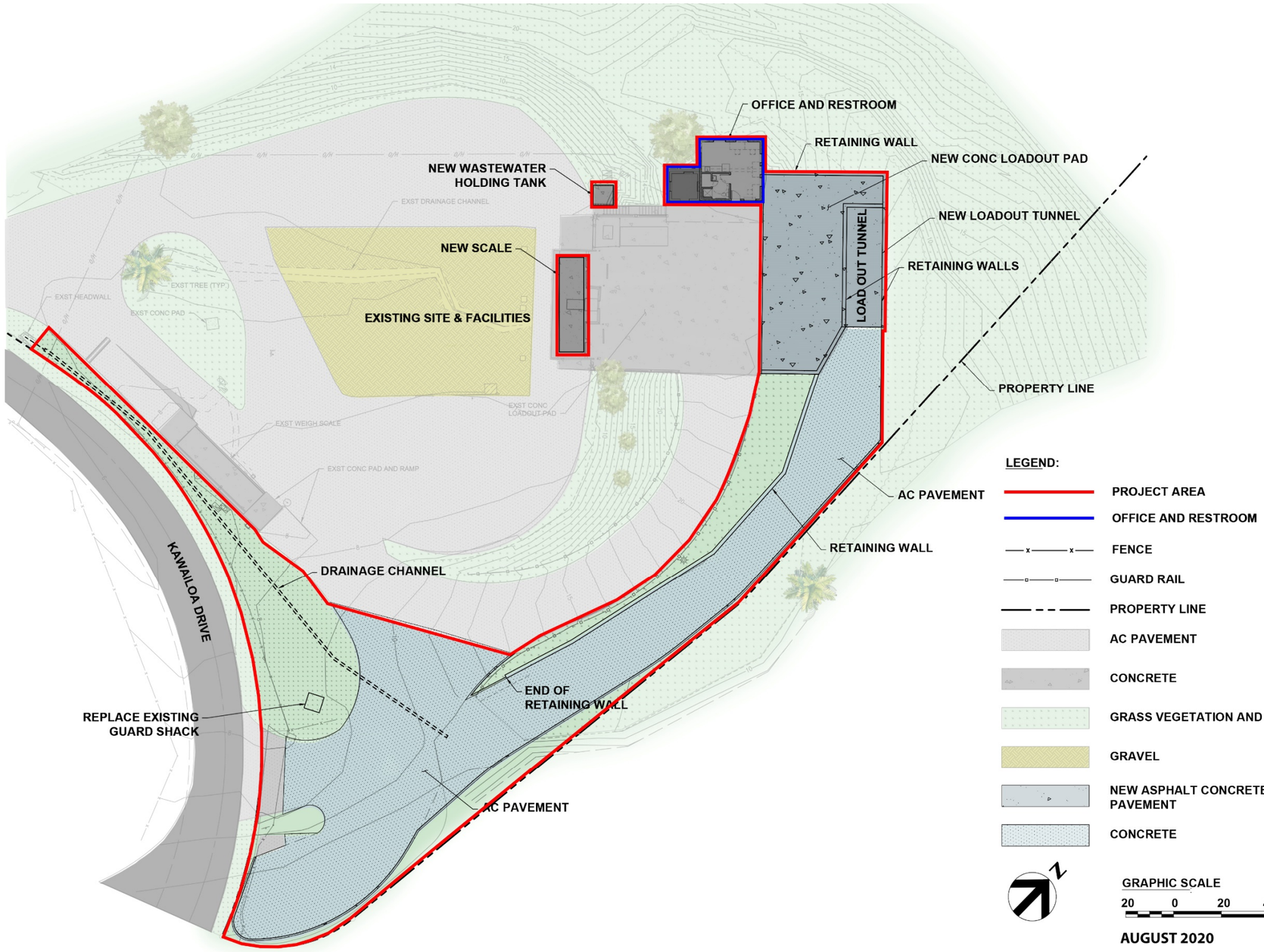

Figure 2.3 **Kawailoa Transfer Station Conceptual Site Plan**

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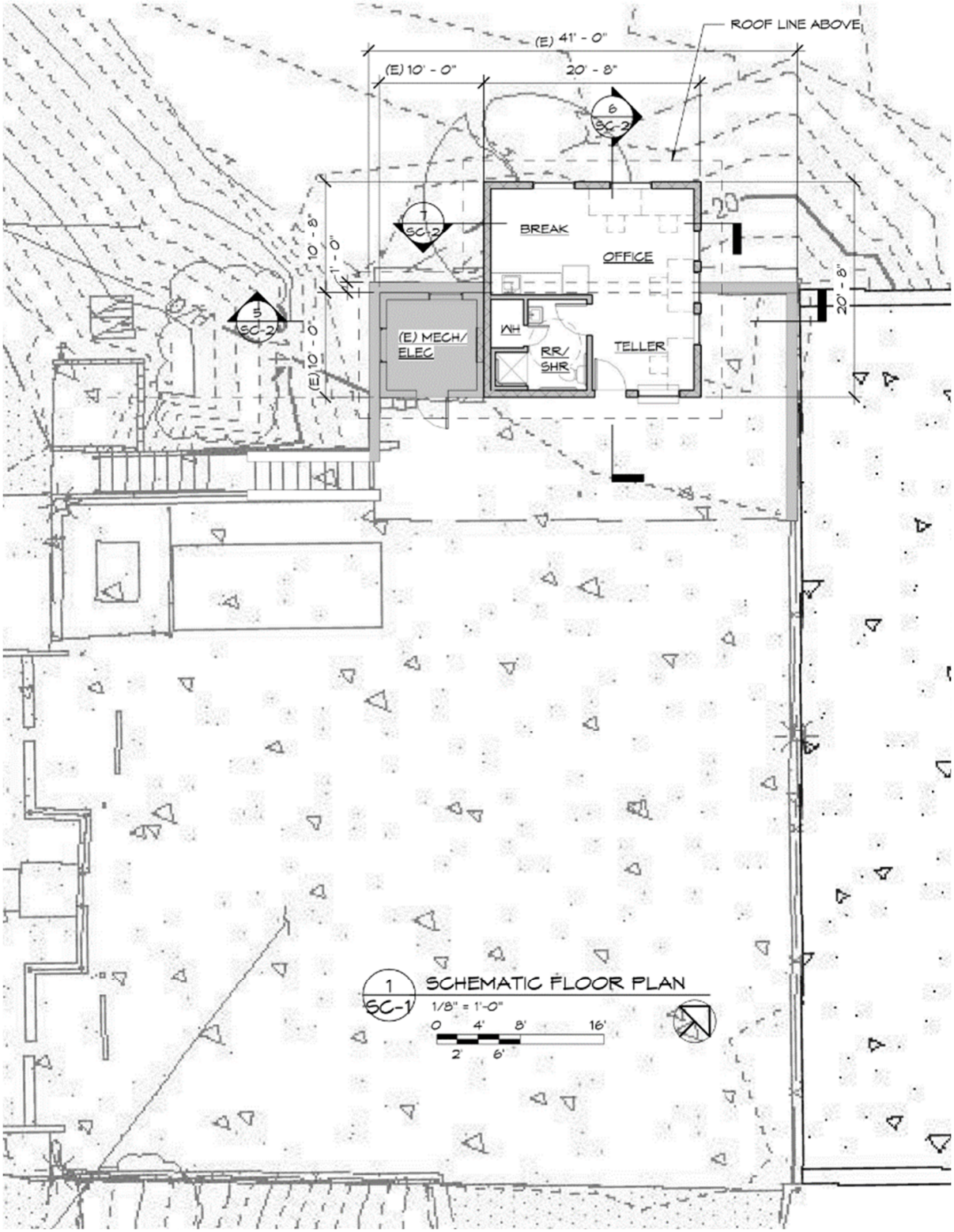

Figure 2.4 **New Office Concept Layout**

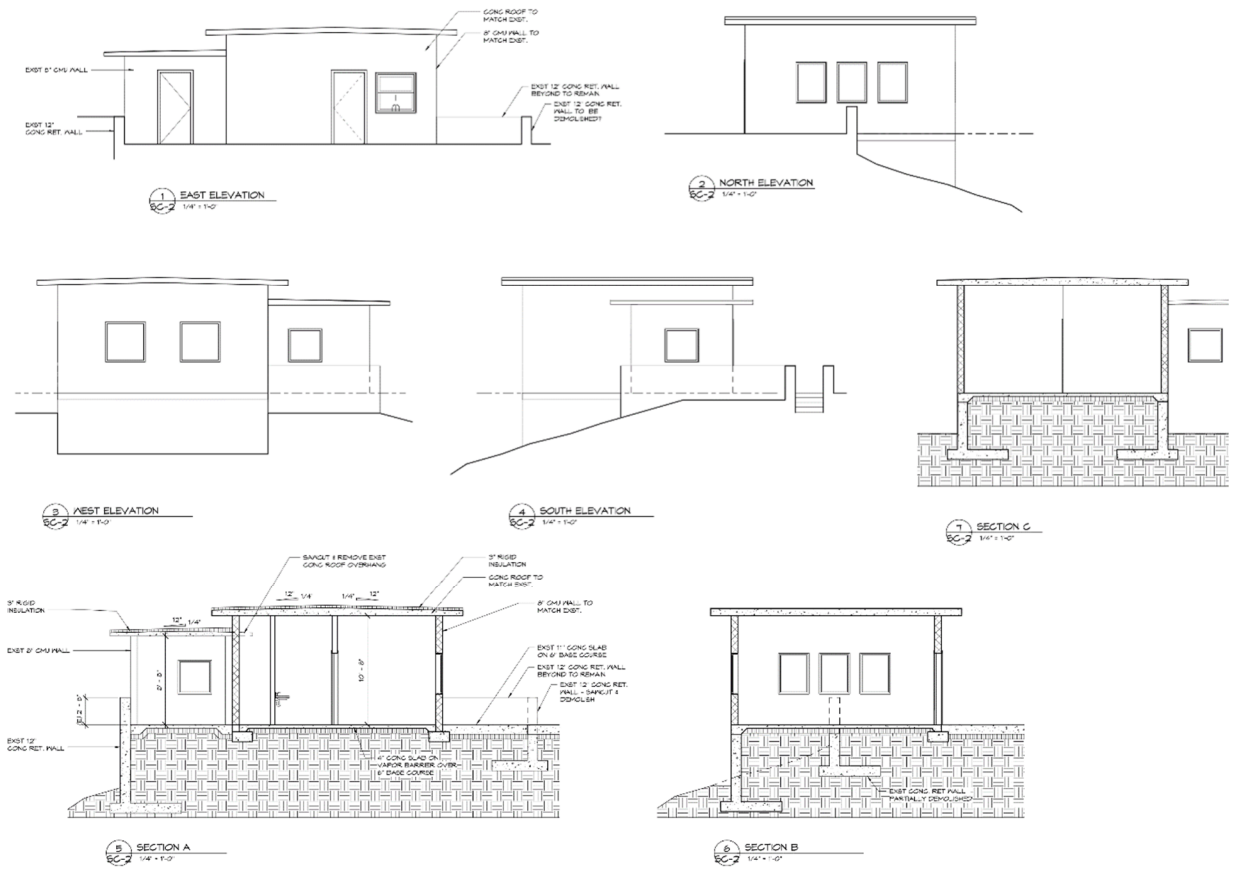

Figure 2.5 **New Office Elevations**

The existing portable office trailer will be moved elsewhere in the transfer yard and used for storage. In addition, the attendant/guard shack will be replaced.

Construction will also involve expanding the Tipping Area, a new transfer trailer bay and a parking /staging area for vehicles. Expansion of the Tipping Area is intended to provide the added space an additional transfer area will require, including the total of four vehicles the Tipping Area will have to accommodate at a single time. With an additional transfer area, the green waste may be received separately from the MSW at the improved transfer station and taken to Hawaiian Earth Recycling in Wahiawā.

The new loadout station will be designed to operate in a similar fashion to the existing facility and will use open-top trailers to haul the green waste. The main transfer building is a two-level facility with a drive-through tunnel for loading. The City's automated collection vehicles and residents will deposit their loads directly into the tipping chute (the upper level), where the green waste falls into the trailers below *(Figure 2.6).* A Solid Waste Grapple/Tamper crane is a combination tamper and bucket and will be used to balance the load in the trailer *(Figure 2.7).* The load will be weighed by a scale located under the trailer. A trench drain will collect any leachate and stormwater from the property where it will gravity flow to a leachate holding tank until collected by a waste handler.

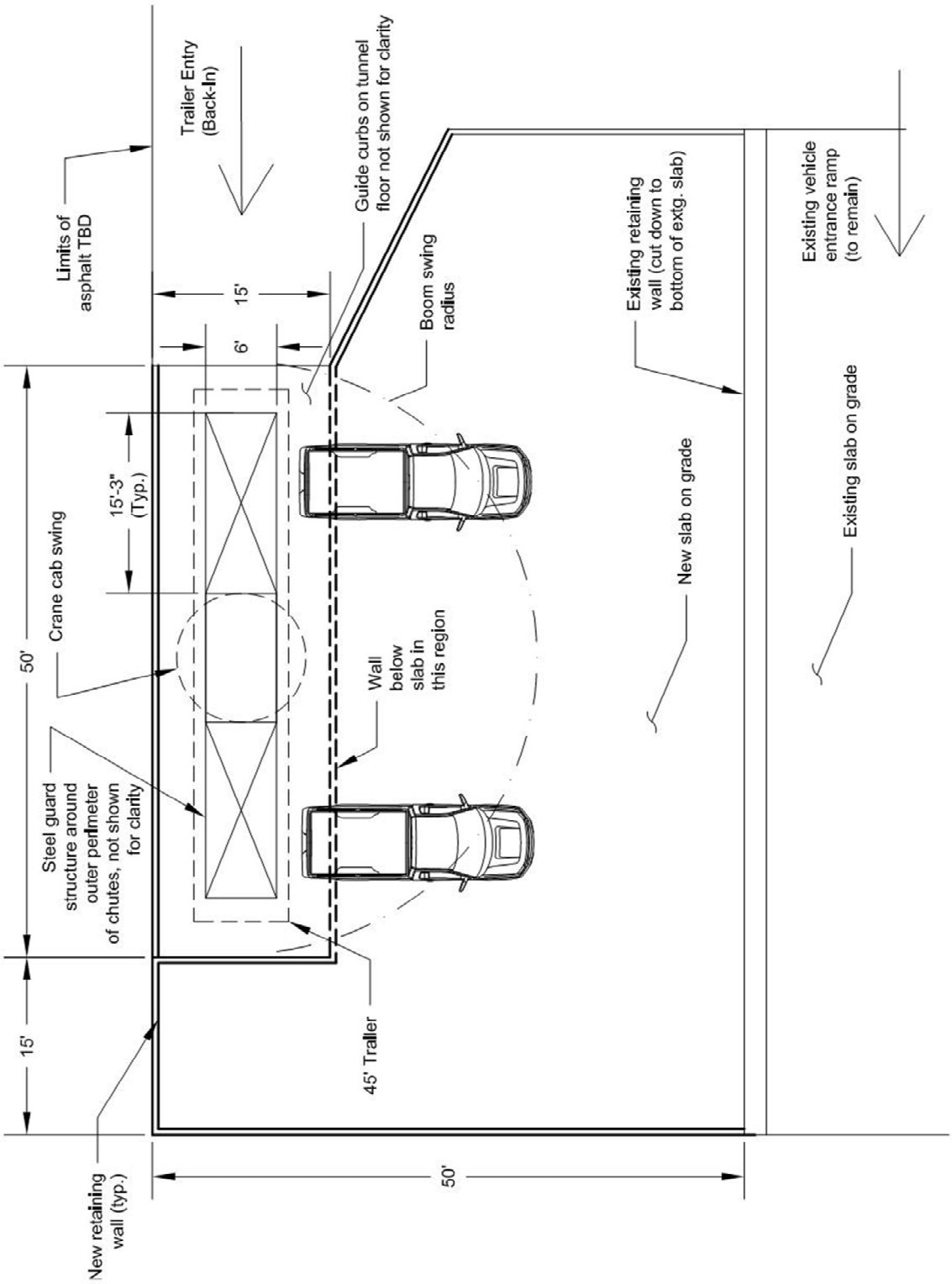

Figure 2.6 **New Loadout Station Concept Layout**

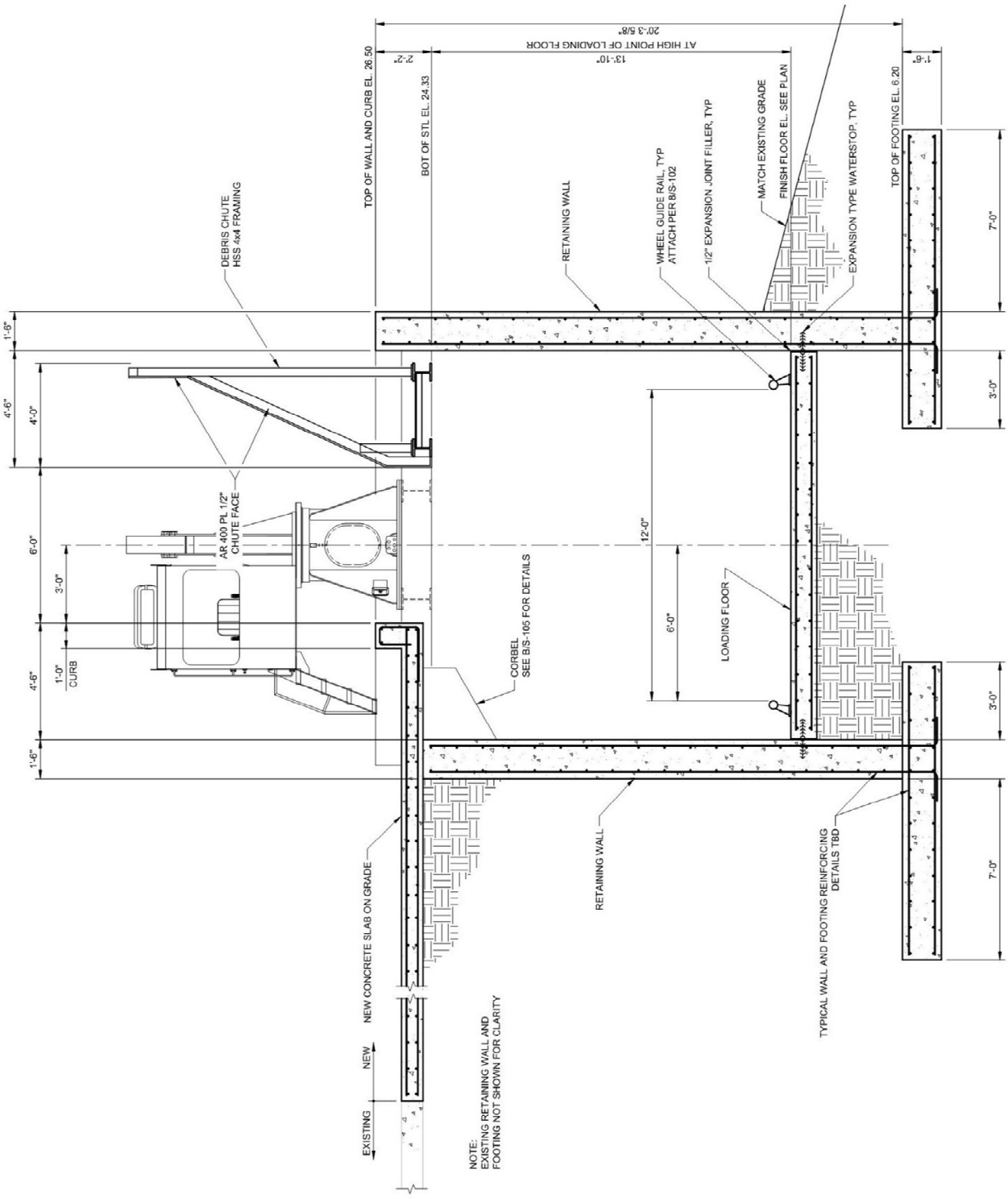

Figure 2.7 **New Loadout Station Cross Section**

To construct the new loadout station on the northeastern portion of the property, the grouted riprap as well as a portion of the embankment supporting the existing ramp will be removed and excavated, and then stabilized with a retaining wall to create a driveway for the new loadout. A trench drain located at the entrance to the new loadout driveway will collect any stormwater and direct it to an existing earthen channel.

The existing loadout station does not currently have a vehicle weigh scale. It will be outfitted with a new scale, trench drain, and leachate holding tank. Use of existing exterior lighting installed for security and operational purposes at the tipping platform will be continued, which are standard street lights. The transfer station is primarily operational during daylight hours. A security guard is present through the night, and the platform area lights are turned off by timer in the morning.

The main traffic patterns at the transfer facility will not change with the improvements. City garbage and green waste trucks using the facility will continue to drive up onto the transfer station platform and reverse at a 90 degree angle to unload into the transfer trailers *(Figure 2.3).* Self-haulers who choose to bring excess garbage and yard waste to the transfer station are also directed up on the platform. Signs will direct haulers with general waste to one side of the platform, while those with green waste will be directed to the other side of the platform. Should there be a mechanical failure at one loadout, traffic will be directed to the one available, and waste will be co-mingled.

Transfer trailers will continue to pull up at the lower edge of the platform to receive loads at the existing loadout bay. Transfer trailers will need to back into the new loadout station and will have room to pull forward to straighten out the trailer. To allow for sufficient maneuvering space, the location of the white goods, tire bin, and propane tanks/fire extinguishers holding areas will be moved to a central location within the property *(See Figure 2.8).*

2.5 Hours and Manner of Operation

The facility operates seven days a week from 7 a.m. to 6 p.m. except Christmas and New Years Day. The facility is operated by six employees, including the lead operator, two equipment operators, and three truck drivers. Although the proposed improvements are primarily for redundancy, and KTS is not expecting additional increases in volume, additional truck drivers will need to be hired to efficiently operate the second loadout.

2.6 Required Permits and Approvals

Permits and approvals required for this Project will include:

- Final EA/FONSI, HRS Chapter 343
- SMP – Major
- Modification to Existing Solid Waste Management (SWM) Permit
- Grading, Grubbing, Trenching and Stockpiling Permits
- Building Permits

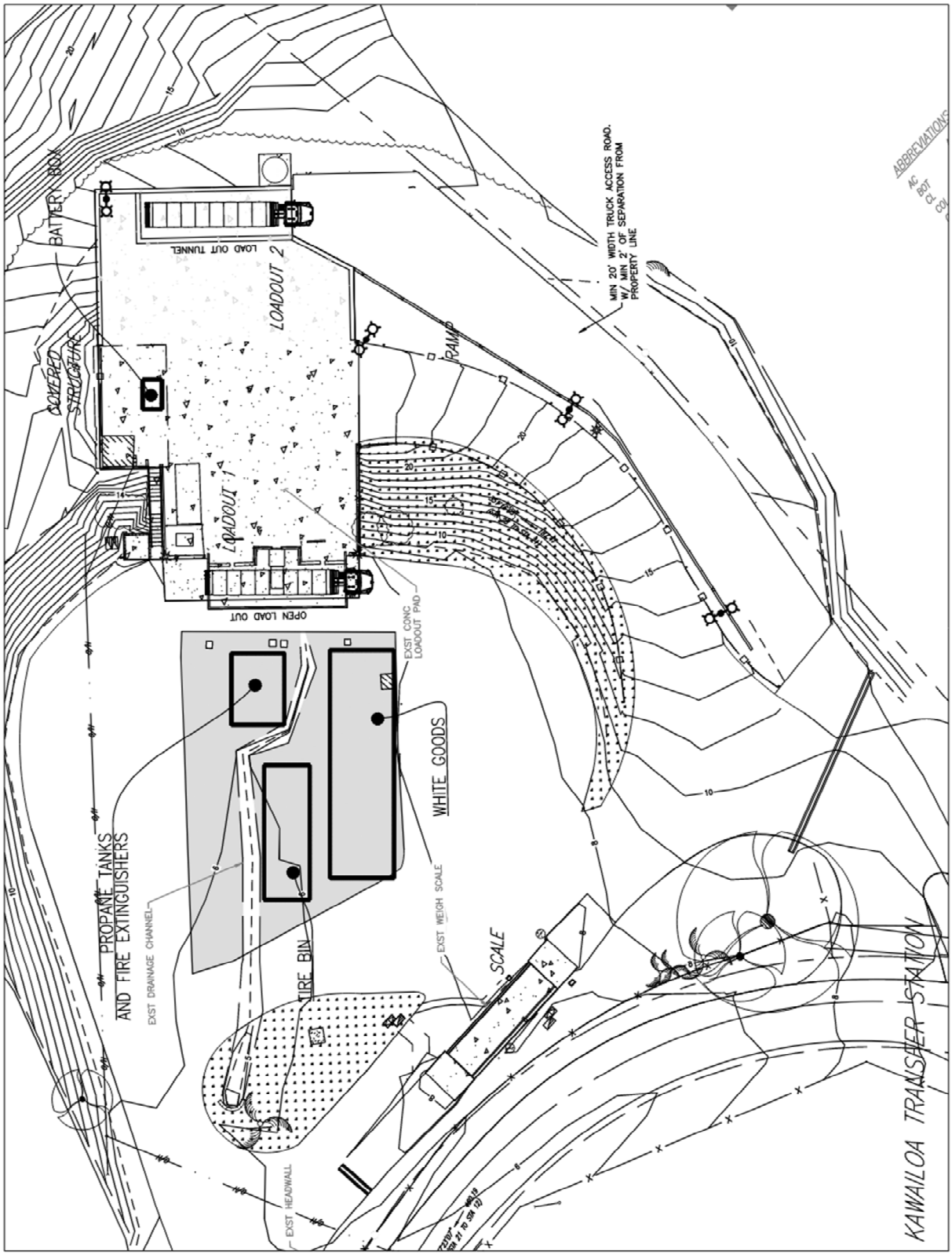

Figure 2.8 **Kawailoa Transfer Station Proposed Solid Waste Bin Locations**

Section 3

Environmental Setting, Potential Impacts, and Mitigation Measures

Chapter 3

Environmental Setting, Potential Impacts, and Mitigation Measures

The environmental setting, potential impacts, and mitigation measures for the proposed improvements to KTS are addressed in the sections below.

3.1 Climate

Existing Conditions

The climate at the Project site, on the North Shore of Oʻahu, is mild and semi-tropical with slight seasonal variations. The average maximum daily temperature ranges from 69 degrees Fahrenheit (°F) to 87°F, with an average minimum temperature ranging from 61°F to 79°F. Rainfall for this area is approximately 36 inches annually, with most of it occurring between November and April.

Northeasterly winds prevail much of the time throughout the State of Hawaiʻi. Typical wind velocities range from 3 to 14 knots. During the summer months stronger, more persistent trade winds result with the location of the North Pacific high pressure system. Light and variable westerly "kona" winds occasionally replace this pattern, most often in the winter.

Anticipated Impacts and Proposed Mitigation

The proposed action will have no effect on climatic conditions; therefore no mitigation measures are required.

3.2 Soils, Topography and Grading

Existing Conditions

The soil types or classifications for the Project site are based on soil surveys by the USDA NRCS. The NRCS system classifies soils by type, capability classification, and permeability. Based on the NRCS (2016) map for the area, the Project site soil is classified as Waialua Stony silty clay (WIB), 3 to 8 percent slopes. Directly adjacent to the site, coral outcrop (CR) soil type is found, an excessively drained soil with low runoff that is found near beaches and toeslopes. The area across the road to the south contains marshlands (MZ). WkB soil types are found on other nearby lands *(Figure 3.1).*

The Land Study Bureau of the University of Hawaiʻi (1972) classifies the Project site "D" on a scale for which "A" is highest level of agricultural productivity and "E" is the lowest level. The adjacent areas are rated "D" and "E".

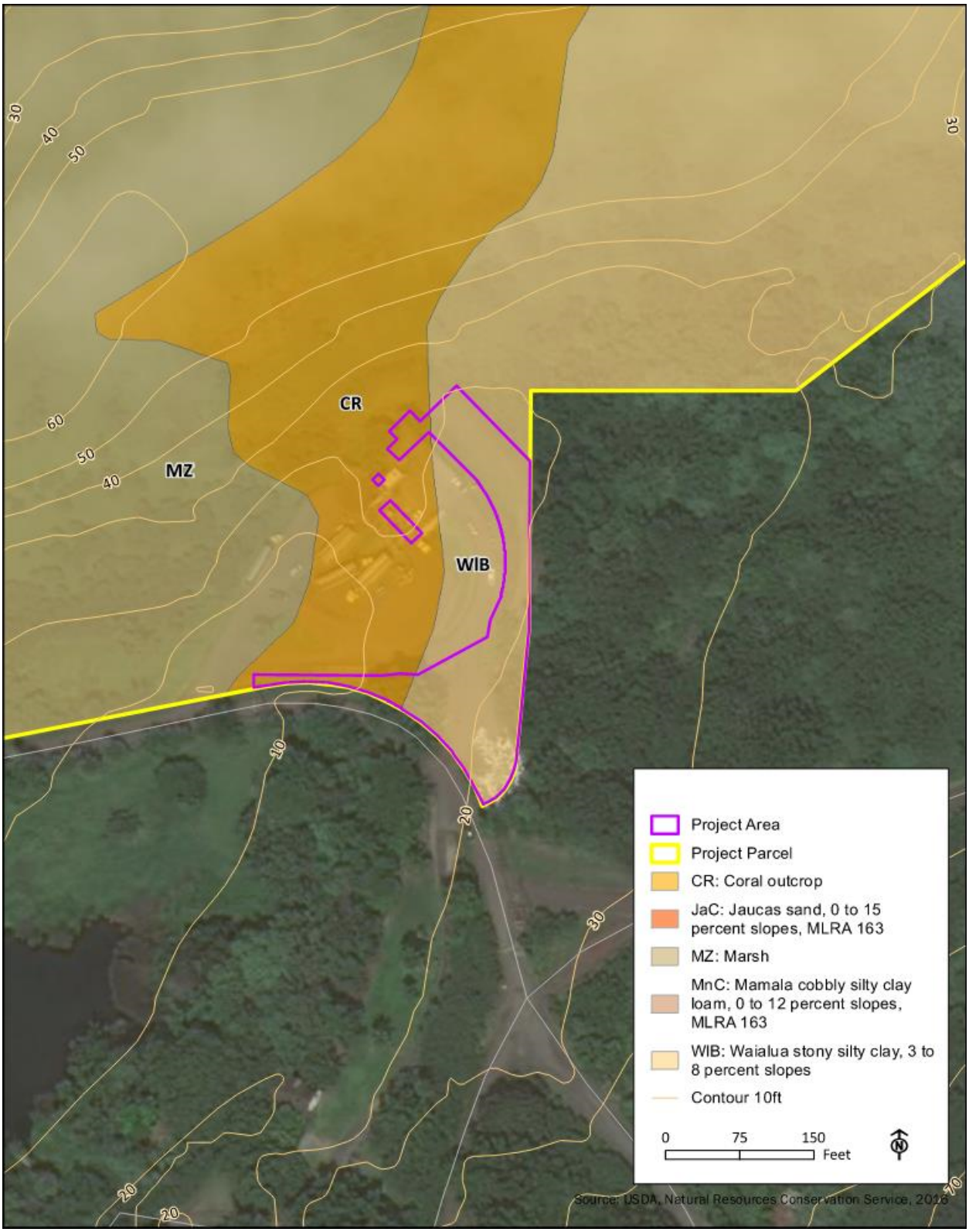

Figure 3.1 **Topography and Soil Classifications**

The site has been used as a solid waste facility and transfer station for approximately 34 years. Given previous development and existing uses at the Project site, the proposed improvement area is not considered to be significant agricultural land by the above sources.

The site's topography, as exhibited in *Figure 3.1,* varies, ranging from approximately 10 feet above mean sea level (msl) at the level parking area of the site to 20 feet above msl at the north and eastern portions of the transfer station. The raised tipping platform rises to an elevation of approximately 24 feet. The site contains slopes of 0 to 10 percent in the planned development area.

Anticipated Impacts and Proposed Mitigation

To the extent possible, the transfer station improvements will be designed to minimize changes to topography. Limited earthwork will be required to perform essential modifications to site grades and fine adjustments to accommodate construction of the new transfer area. Minor grading will be required for new paved areas such as the proposed transfer trailer staging area. Over the main portion of the site, final elevations will generally be within one to two feet of existing grade.

Development of the site will involve vegetation clearing, minor grading and excavation (cut and fill) and general construction. Based on reviewed plans and soil investigations, the landfill is not anticipated to be impacted; however, mitigation measures will be taken if the landfill is encountered during earthwork. The construction of the proposed facility will require the excavation of 378 cubic yards (cy) of the existing ramp, and embankment of 1,151 cy within a disturbance area of 0.64 acres (Figure 3.2). The embankment will be shored with a retaining wall. Earthwork in other areas will generally consist of fine adjustments to site grades to allow for new paved areas. Grading operations will balance the existing material on-site.

According to the City Rules Relating to Water Quality §3-14(f), KTS is considered a Category 3 project as it requires a grading, grubbing, or stockpiling permit and is 7,500 square feet or more, but the total area graded or stockpiled upon is less than 7,500 square feet. The Project will require an Erosion and Sediment Control Plan (ESCP). ESCPs must include BMPs to address and achieve erosion control, sediment control, and good housekeeping practices as outlined in the City Rules Relating to Water Quality §3-22(c).

A minimum 20-foot setback will be provided between the edge of the closed landfill and the transfer station. A pre-construction investigation will be conducted to define the landfill edge. If the landfill edge is less than 20 feet from the facility, landfill material will be excavated, and hauled to Waimanalo Gulch Sanitary Landfill for disposal. The landfill cover will be replaced to create the needed setback area. The Office of SWM will be conferred with during site investigation and construction processes.

Grading operations will be conducted in compliance with dust and erosion control requirements of the City Grading Ordinance. A grading permit will be obtained from the City in order to begin construction. The contractor will be required to perform proper quality control density testing during fill and sub-grade compaction in accordance with the planned improvement specification requirements.

Construction Best Management Practices (BMPs) will be implemented to mitigate potential adverse environmental impacts that may occur as a result of the planned improvements. During construction, contractors will utilize erosion control and land-based sources of pollution barrier measures as appropriate to manage sediment discharge into nearby waters, such as sediment traps, silt fences, dust fences, and truck wash-down areas. A stabilized construction entrance will be created at the

second entrance gate, and BMP controls will be used to minimize the trailing of dirt and debris on Kawailoa Drive and City roadways.

Primary fugitive dust control methods that will be implemented include regular watering of exposed soil areas, good housekeeping on the job site, prompt landscaping, and covering or paving of bare soils in areas where construction is completed. The impact of construction activities on soils will be mitigated by practicing strict erosion control and dust control measures, particularly those specified in the following:

- City Grading Ordinance; ROH §14-13 Provisions for Grading, Soil Erosion & Sediment Control
- City Rules Relating to Water Quality, §3
- DOH, Water Quality Standards, §11-54
- USDA NRCS, Erosion and Sediment Control Guide for Hawai‘i

3.3 Drainage and Hydrology

Existing Conditions

Stormwater runoff generated from the ramp embankment flows northeast, seeping into the pervious ground on-site. Stormwater in the parking area and elsewhere on the property collects and is diverted to shallow on-site drainage swales *(Figure 3.2).* The drainage swales are located within and along the perimeter of the site, running west through the central graveled area for truck and employee parking, and along the fence line adjacent to Kawailoa Drive. The central and road-adjacent drainage swales each end in a block headwall and a 12-inch reinforced concrete pipe, draining via a culvert underground across Kawailoa Drive to a siltation basin makai of the facility.

The Project site is situated across Kawailoa Road from ‘Uko‘a Pond and Marsh, a natural resource asset to the North Shore community. ‘Uko‘a Pond is classified as a PEM1C Freshwater Emergent Wetland (palustrine system, emergent class, subclass persistent, and water regime seasonally flooded). All stormwater is collected on-site, directing runoff away from the marsh to the drainage culverts.

No jurisdictional waters are currently present on the Project site. During the processing of the transfer station SMP (84/SMA-78), a portion of the Project site had been designated as a wetland. At that time, a Department of Army Permit (DA) was issued to allow fill and construction of the transfer station. In a letter dated December 10, 2002, the Army Corps indicated that no further DA permit would be required for the proposed green waste recycling improvements.

KTS lies above the Kawailoa aquifer system, which has an upper and lower aquifer. The aquifer is not suitable for drinking, as evidenced by its location below the Underground Injection Control (UIC) boundary. The upper aquifer is a basal aquifer type where fresh water is in contact with saltwater. The unconfined aquifer has a water table that is at the upper surface of a saturated, sedimentary aquifer of non-volcanic lithology. The groundwater is currently used and ecologically important, with a low salinity of 250 to 1,000 milligrams per liter (mg/L) of chloride. It has an irreplaceable uniqueness and high vulnerability to contamination.

The lower aquifer is also basal, but confined, where the aquifer is bounded by impermeable or poorly permeable formations, and the top of the saturated aquifer is below the groundwater surface. This is a flank aquifer type with horizontally extensive lavas. The groundwater is currently used and ecologically important, with a fresh water salinity less than 250 mg/L of chloride. It has an irreplaceable uniqueness and moderate vulnerability to contamination. There is no groundwater well at this site.

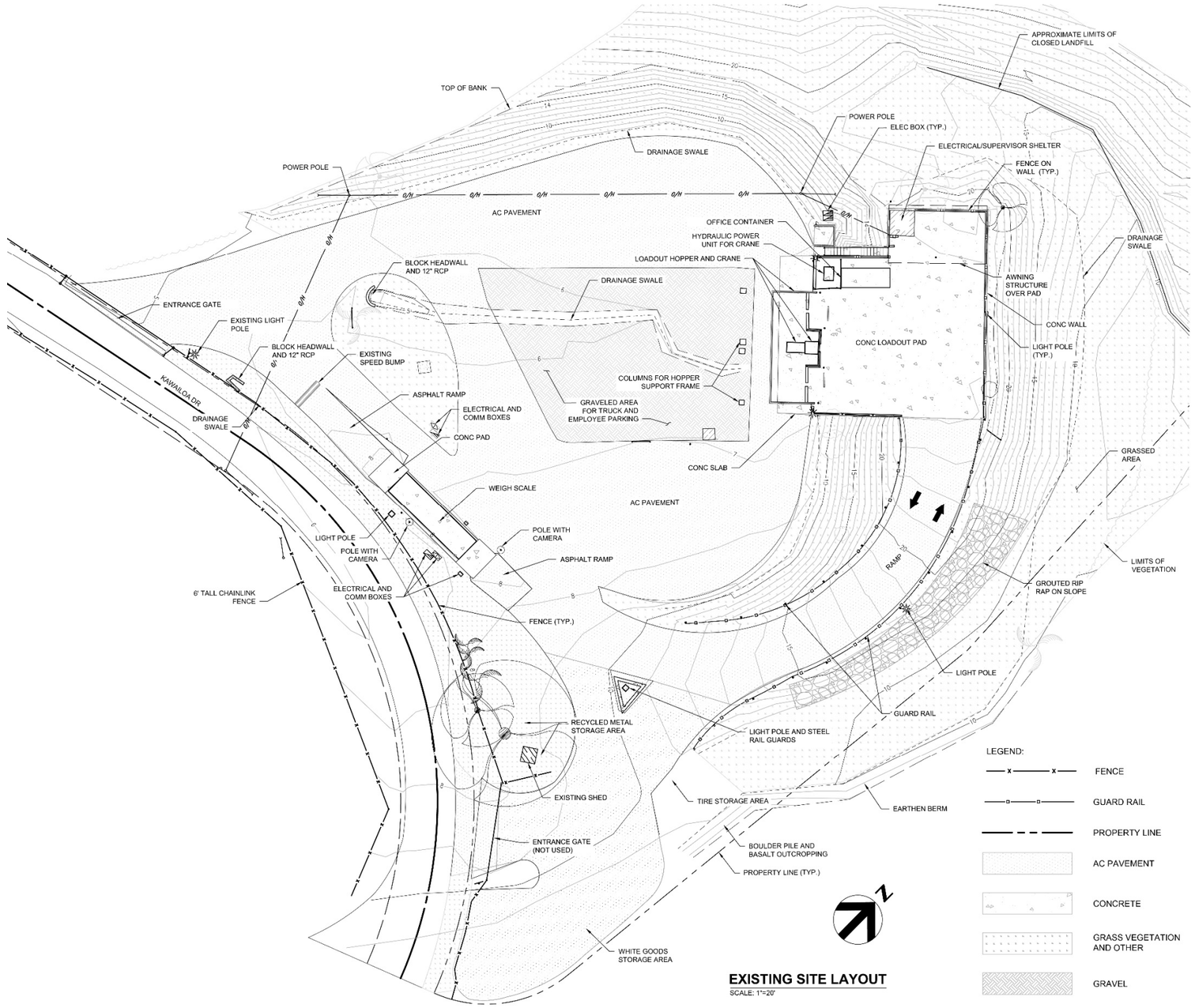

Figure 3.2 **Kawailoa Transfer Station Grading and Drainage Plan**

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Anticipated Impacts and Proposed Mitigation

Stormwater flow will be directed to existing culverts. These culverts are adequate for the proposed Project. Drainage easements are owned by the City, who is responsible for maintenance.

An improved drainage channel will be constructed at the base of the green waste loading driveway where the existing swale is currently located, along the southern property line just inside the fence parallel to Kawailoa Drive *(Figure 2.3).* The channel will drain into the existing headwall. This headwall will be removed and replaced. Conveyance and discharge of stormwater runoff will be in accordance with the City Storm Drainage Standards (2018).

The drainage improvements have been designed to direct runoff away from ‘Uko‘a Pond, and therefore no adverse impacts are anticipated once the Project is completed. Runoff from construction will be managed under grading permit requirements. Construction, grading and drainage plans for the KTS site will be submitted to appropriate agencies for review and approval. Should any spills of sediment or wastewater during Project construction occur, it will be reported promptly, and the impact will be assessed by DLNR DOFAW.

The planned improvements will add approximately 0.31 acres (13,503 square feet) of impervious surface for the expanded platform. As with the current operation, runoff from the platform area will continue to be routed from the platform and dispersed in the pervious surrounding grounds on-site or into the drainage swale. A trench drain will collect any leachate and stormwater from the property where it will gravity flow to a leachate holding tank until collected by a waste handler (see *Section 3.10).* Since there will be no seepage from the transfer facility, no impact on groundwater is expected. Groundwater management will not be affected by construction or operation activities.

No groundwater well is planned at the Project site. The use of approved chemicals in strictly controlled applications at the transfer station will not cause a significant contribution of biocides in runoff from the site. There may be minimal amounts of these chemicals carried in surface water runoff from the site. However, because of the limited size of the site, measures taken for drainage routing and detention, and the chemical’s susceptibility to volatilization and natural degradation, these contributions are not anticipated to be detectable in runoff reaching surface water or groundwater. The Project is not expected to pose a threat to local or regional water quality and ecology.

3.4 Natural and Manmade Hazards

Existing Conditions

Hurricanes and Tropical Storms

Hurricanes and tropical storms are both categorized as tropical cyclones, which are warm-core storms that originate over tropical waters with well-defined centers of closed surface wind circulation. A hurricane is a tropical cyclone which sustains surface winds of 64 knots (74 miles per hour [mph]) or more. Tropical storms are categorized as an organized system of strong thunderstorms with defined circulation and maximum sustained winds of 39 to 73 mph (National Oceanic and Atmospheric Administration [NOAA], 2015).

Hurricanes are considered to be relatively rare events in the Hawaiian Islands. Records show that strong wind storms have struck all major Hawaiian Islands. The first officially recognized hurricane in Hawaiian waters was Hurricane Hiki in August 1950. Since that time, five hurricanes have caused serious damage in Hawai'i: Nina (1957), Dot (1959), 'Iwa (1982), Estelle (1986), and 'Iniki (1992).

However, with rising global temperatures, Hawaiʻi is expected to experience a higher incidence of tropical storm events. In most recent history, Tropical Storm Olivia made landfall on Maui and Lānaʻi in 2018, causing considerable flooding, power outages, and road and school closures. Also in 2018, Tropical Storm Lane never made landfall in Hawaiʻi, but unleashed record-breaking rainfall across parts of the island chain, causing considerable flooding and damage.

Earthquakes

Based on the 2012 United States Geological Survey (USGS) International Building Code (IBC) Seismic Design Map, KTS could experience up to 0.15 earthquake ground motion accelerations (g-force). This represents the lower limits of probable force experienced by the island of Oʻahu during a seismic event. In contrast, the Mauna Loa and Kīlauea Volcanoes on Hawaiʻi Island could experience up to 1.47 g-force.

Flooding and Tsunami Inundation

The areas planned for improvements at KTS are primarily located in Flood Zone XS *(Figure 1.6*). This rating indicates an area of 500-year flood plain or a 0.2 percent annual chance of flood. The southernmost portion of the site is located in Flood Zone D, where flood hazards are undetermined but possible. The Project site is within 2,000 feet of the coastline areas, which are susceptible to coastal flood and wave action.

The sudden displacement of the ocean floor (earthquakes), landslides, or volcanism can generate tsunamis, which are a series of waves that can reach speeds of up to 600 mph. Upon reaching a coastline, a tsunami can become a wall of water reaching heights of 30 feet or more and capable of moving inland several hundred feet. Known major tsunami events in Hawaiʻi include the areas of East Hawaiʻi (1946, 1960, 1975) and North Shore Oʻahu (1952, 1957).

All of the KTS site is located within the Tsunami Evacuation Zone (Figure 1.6). In the event of a tsunami, waves may move significantly inland, and evacuation to a Safe Zone (further mauka on Kawailoa Road) is recommended in accordance with guidance from the City Department of Emergency Management and International Tsunami Information Center.

Climate Change and Sea Level Rise

Rapid anthropogenic climate change is a well-established fact within the scientific community. A 2013 study by a University of Hawaiʻi (UH) team of researchers predicts that tropical regions will experience drastically warmer climates by the year 2047. As a result of climate change, oceans are warming and acidifying, ice sheets and glaciers are melting, and sea levels are rising.

In addition to rising temperatures, sea level rise (SLR) is a notable concern for coastal communities. SLR has historically driven shoreline changes throughout the Hawaiian Islands. The global annual SLR averaged over the last century was roughly two millimeters, with previous studies indicating that this rate is now approaching three millimeters and may accelerate in the coming decades. According to the 2017 Hawaiʻi Sea Level Rise Vulnerability and Adaptation Report, the sea level in Hawaiʻi has increased at a rate of 0.6 inches or more each decade over the past century. While predicting future SLR is challenging because of unknown parameters, research shows that global msl may rise

approximately one foot by mid-century and 2.5 to 3.2 feet by 2100, with some studies showing a possible rise of up to 6 feet. According to recommendations provided in the 2017 report, an appropriate planning target to use in the design of future projects within the exposure area would be 3.2 feet. It is also practical to expect that a hurricane will make direct landfall in Hawaiʻi under conditions of higher sea levels and that tsunamis will continue to arrive at Hawaiian shores.

The 2018 Sea Level Rise Guidance by the City Climate Change Commission notes that rising seas threaten human communities and natural ecosystems in multiple ways. Urbanized coastal areas will become increasingly vulnerable to four types of flooding during high water and high wave events, including 1) flooding across the shoreline due to wave run-up; 2) saltwater intrusion of engineered drainage systems; 3) groundwater inundation, affecting buried infrastructure and formation of new wetlands; and 4) rainstorms, especially concurrent with high tide. Other threats include land loss and coastal erosion, increased wave energy at the shore, and further inland flooding from annual high wave activity.

Anticipated Impacts and Proposed Mitigation

Hurricanes and Tropical Storms

The effects of past storm events have caused minimal to no damage at KTS. The future threat of hurricanes at KTS cannot be calculated, although the frequency of hurricane threats may increase with climate change and warming ocean waters.

When a hurricane is approaching a coastal location, early evacuation is usually standard mitigation to address the possibility of accompanying storm surge with high winds. The National Weather Service provides guidance and when necessary during an event, issues a hurricane watch when a storm is expected to make landfall within 36 hours. A hurricane warning is issued when landfall is likely within 12 to 24 hours.

Earthquakes

All buildings for the planned improvements will be constructed in compliance with regulatory controls to meet City Building Code requirements as appropriate to IBC seismic probabilities.

Flooding and Tsunami Inundation

The Project site is within Flood Zones D and XS, areas with an undetermined to 0.2 percent chance of flooding. These are areas outside the Special Flood Hazard Area, therefore no structural measures are required.

Climate Change and Sea Level Rise

Per the Hawaiʻi Sea Level Rise Viewer (PacIOOS 2020), using the potential for chronic flooding with 3.2 feet of SLR exposure area (SLR-XA) as the vulnerability zone for planning purposes, it is noted that no portion of KTS is located within areas potentially exposed to chronic flooding with SLR *(Figure 3.3).* However, it is noted that north of the site, a portion of Kamehameha Highway (State Route 83) is located within an area with potential for chronic flooding with 3.2 feet of SLR by 2100. Long-term planning for Highway removal or replacement will need to be addressed in this region by the State DOT and the adjacent landowners. KTS is located off Kamehameha Highway that residents and visitors use to access the North Shore of the island, and continuous transportation will be important.

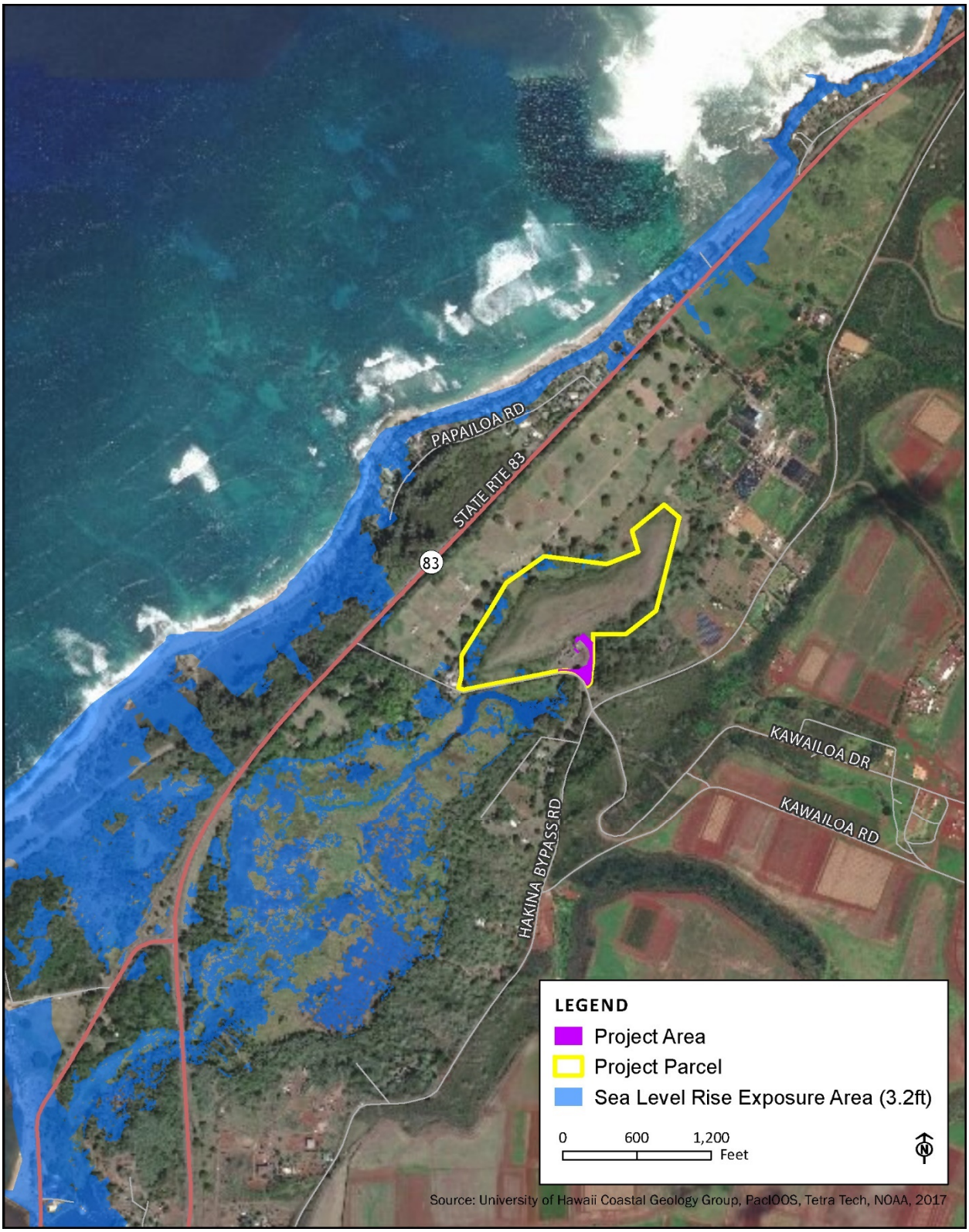

Figure 3.3 **Potential for Chronic Flooding with 3.2 Feet of Sea Level Rise (SLR-XA)**

3.5 Flora and Fauna

A natural resources survey of flora and fauna at the KTS Project site was undertaken by AECOS in November 2020 *(Appendix I)*. The many ornamental plants maintained in pots were not identified and listed as part of the survey.

Existing Conditions

The Project site has been surveyed for botanical and wildlife resources. There are no endangered, candidate endangered or threatened plant or animal species present at the site.

Flora

The Project site vegetation is mostly weedy growth with a few scattered trees planted as part of the landscaping (mostly date palms, *Phoenix* hybrid) and tall kiawe *(Prosopis pallida),* the latter located just off the property. The property is bordered by dense grassy slopes (mostly Guinea grass or *Megathyrsus maximum*) and shrubland *(koa haole* or *Leucaena leucocephala)* on the west; a forest is present to the east. Landscaping consisting of a wide variety of ornamentals (mostly bromeliads), many in pots, line the lower east margin of the site.

The survey observed 64 taxa within the area. This count is large considering the size of the property, but understandable in light of the regular disturbance of most areas and likelihood of constant accidental introductions from users of the facility. None of the species recorded are native plants, although three are early (precontact) Polynesian introductions. These include ‘ihi‘ai or yellow wood sorrel *(Oxalis corniculate),* ki or ti *(Cordyline fruticosa)* and a hybrid banana *(Musa acuminata).* All three of these species are commonly occurring species of no special cultural significance.

There are no species of plants of conservation concern or listed as threatened or endangered at the sites of planned KTS Improvements.

Fauna

A total of 138 individual birds representing 18 species were recorded from the point-count stations. Common Myna *(Acridotheres tristis),* Zebra Dove *(Geopelia striata),* and Domestic Chicken *(Gallus gallus)* were the most common species observed and collectively account for almost half (45 percent) of the total birds enumerated. The bird species observed correspond to the disturbed, coastal lowland habitats present at the Project site.

The Hawaiian endemic sub-species of Short-eared Owl or pueo *(Asio flammeus sandwichensis)* is state-listed as endangered on O‘ahu only. Short-eared Owl nest on the ground and are thus susceptible to mammalian predation. The species is increasingly scarce on O‘ahu but has been observed in the general vicinity. No evidence of Short-eared Owl was found in the survey. The disturbed industrial habitat available at the Project site has no potential to support this species, although on occasion owls may hunt rodents attracted to the Project site.

No waterbird habitat occurs within the Project site. However nearby (across Kawailoa Drive) occurs extensive open water of ‘Uko‘a Pond. State listed waterbirds such as the Hawaiian Duck *(Anas wyvilliana),* Hawaiian Stilt *(Himantopus mexicanus knudseni),* Hawaiian Coot *(Fulica alsi),* and Hawaiian Common Gallinule *(Gallinula chhloropus sandvicensis)* have the potential to occur in the vicinity of the Project site.

Only tracks and a sighting of domestic cat *(Felis catus)* were noted around the Project site, although it is probable that small Indian mongoose *(Herpestes javanicus)* and one or more alien Muridae species (rats and mice) utilize the Project site to some extent. The findings of the mammalian survey are consistent with the location of the Project in an industrial setting.

Yellow-faced bee are listed as endangered in the Hawaiian Islands, and six of seven species of yellow-faced bee are known to occur on O'ahu *(Hylaeus anthracinus, H. assimulans, H. facilis, H. kuakea, H. longiceps,* and *H. mana)* in montane and coastal habitat. No yellow-faced bee species were observed during the survey. The Project site lacks habitat for the bees as well as endangered native damselflies.

No federally or state designated Critical Habitat occurs in the Project vicinity.

Anticipated Impacts and Proposed Mitigation

DOFAW recommends minimizing the movement of plant or soil material between worksites, such as infill. Soil and plant material may contain invasive fungal pathogens (e.g. Rapid 'Ohi'a Death), vertebrate and invertebrate pests (e.g. Little Fire Ants, Coconut Rhinoceros Beetles), or invasive plant parts that could harm our native species and ecosystems. The O'ahu Invasive Species Committee should be contacted during the planning, design, and construction of the Project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.

The potential presence of the following species may require additional consideration and mitigation measures:

- *State listed waterbirds* – It is against State law to harm or harass State listed waterbirds. If any of these species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, the O'ahu DLNR DOFAW Office should be contacted.

- *Seabirds* – Hawaiian seabirds may traverse KTS at night during the breeding season (March 1 to December 15). Potential seabird species may include the endangered Hawaiian petrel (*Pterodroma sandwichensis*), threatened Newell's shearwater (*Puffinus auricularis newelli*), and endangered Distinct Population Segment (DPS) band-rumped storm-petrel (*Oceanodroma castro*).

  While no seabird nestings are located within the planned improvement areas at KTS, use of outdoor lights could pose a potential impact to birds, as lighting can disorient seabirds which can result in their downing or harm. Exterior facility lighting will be shielded to reduce the potential for interactions of nocturnally flying seabirds with external lights or other structures. Automatic motion sensor switches and controls on all outdoor lights can be installed or lights manually turned off when human activity is not occurring in the lighted area.

  Nighttime construction activity will be avoided during the seabird fledgling period of September 15 through December 15. Sealed containers will be used for waste to avoid attracting unwanted predators. Post-construction, trash receptacles will be covered, cats will be removed, and bait stations for rodents and mongoose will be used to minimize predator presence.

- *Hawaiian Hoary Bat* – The Hawaiian hoary bat, or ʻŌpeʻapeʻa (*Lasiuris cinereus semotus*), potentially utilize the Project site. Although KTS has limited vegetation suitable for ʻŌpeʻapeʻa roosting, the improvements will require removal of a large ʻopiuma tree *(Pithecellobium dulce)* for sufficient transfer trailer movement. In order to avoid potential negative impacts to roosting bats, woody vegetation taller than 15 feet will not be removed during pupping season (between June 1 and September 15). If this cannot be avoided, woody plants greater than 15 feet tall should not be disturbed, removed, or trimmed without consulting DOFAW.

Recommended avoidance and mitigation measures will be incorporated into the Project design. The contractor will adhere to Project plans and specifications which will incorporate measures to avoid or minimize impacts to listed species during construction. The Project will implement the identified concerns to minimize impacts to listed animal species.

Reasonable measures will be taken to control vectors (including rodents, cockroaches and other insects), such as frequent removal of trailers. Refuse will be contained in the trailers, and with the trailer opening approximately 13 feet off the ground, it will make it difficult for vermin to enter. Used tires must be stored in a manner that minimizes the accumulation of water and creation of a vector problem, and removed from the facility once every two weeks or more frequently when it is full. Other practices include hiring a professional licensed pest control company with expertise and experience in controlling specific vector populations; treating insect breeding areas, eliminate existing and prevent an new breeding areas as possible; and implement practices that reduce the likeliness of attracting vectors (e.g., remove all waste at the end of the operating day, wash tipping areas daily, pick up litter and other debris daily).

With respect to structural features of the proposed improvements, the soil around the proposed Facility Manager's Office will be initially treated to repel termites using chemicals that are approved for use by the Federal and State authorities, and applied in controlled amounts by a licensed pest control operation. The transfer station grounds will be periodically sprayed for pest control measures. However, it is very costly to apply these chemicals, and their use on this site will be strictly limited for both environmental and cost control reasons.

It is anticipated that the improvements to KTS will not cause long term effects to endangered or threatened plant or animal species.

3.6 Historical and Cultural Resources

A Cultural Impact Assessment (CIA), including archival research and ethnographic surveys of area residents, was completed by Keala Pono Archaeological Consulting, LLC (December 2020). The findings of the assessment are included as *Appendix B.* Additionally, a Literature Review and Field Inspection of the Project site was conducted by Kleinfelder/GANDA in October 2020 and is included as *Appendix C.*

Existing Conditions

The Project site is located on the interior coastal plain in the ahupuaʻa of Kawailoa, however Dega (1996) suggests that prior to the Māhele the area comprised by Kawailoa was traditionally identified as six ahupuaʻa: Kapaeloa, Punanue, Kuikuiloloa, Lauhulu, Kawailoa, and Paʻalaʻa. Sahlins (1992) refers to the other five land units as ʻili. The Project site would have been located in Lauhulu. The Māhele of 1848 was an event marked by complex land transaction that often resulted in changed names and configurations; this report will refer to the single post-Māhele Kawailoa Ahupuaʻa.

Within the vicinity of the Project site lies ‘Uko‘a Fishpond. According to Hawaiian mo‘olelo, this freshwater fishpond was occupied by the goddess Laniwahine (a mo‘o or lizard) and her brother Puhiuila. Traditional accounts of ‘Uko‘a Fishpond recognize its cultural importance as a royal fishpond and its significant economic output of fish. Others recognize that ‘Uko‘a Fishpond was an important aquaculture resource in the political economy of the ruling chiefs.

Following the decline and the collapse of the traditional Hawaiian subsistence economy and chiefly system of centralized taro and fishpond production to the Māhele and Land Tenure Change, large ponds such as ‘Uko‘a Fishpond fell into disuse. Land Commission Awards indicate that lands located in the Project site were awarded to Victoria Kamāmalu under land commission award (LCA) 7713:33, along with most of the land located in the ahupua‘a of Kawailoa and adjacent Pa‘ala‘a. Ownership eventually fell to the Bernice Pauahi Bishop Estate (now Kamehameha Schools).

The Kawailoa area became home to Meadow Gold Dairy, formally known as Dairymen’s Association. The area, which was once swampy lands, was eventually filled in by the Meadow Gold Dairy. Archaeological test excavations conducted by Garcia and Associates in 2015 confirmed the presence of such fill on lands adjacent to the Project site. While dairy operations dominated the Kawailoa area, the current study area became the Kawailoa Landfill which operated from 1954 to 1986. The landfill required alterations to the Project site including grading, construction of large berms, and large amounts of fill.

Interviews with individuals knowledgeable about the Kawailoa area held in October and November 2020 produced information about the cultural significance there. The interviewees have extensive knowledge of Kawailoa and the area surrounding the transfer station. All three interviewees are longtime residents of the region, with one consultant having grown up less than a mile from the Project site and another currently living across from Kawailoa Drive.

Several mo‘olelo were shared about the Project vicinity including stories associated with ‘Uko‘a Pond such as the deity Laniwahine, another about a swimming hole that connected to the ocean. Whereas the interviewees did not mention any traditional gathering practices occurring in the specific Project site, they did note gathering bulrushes and catching fish and prawns in ‘Uko‘a Pond as well as hukilau down at the shore. Many archaeological sites were also shared for the region. Archaeological sites mentioned in the vicinity include the former Kawailoa Camp, a pumphouse, a fishing village, a heiau, a stone wall, a stone mound, ‘Uko‘a Pond, and various cemeteries. One interviewee noted that his grandfather collected multiple traditional artifacts from the area near the pond and possibly also the study lands. These included poi boards, poi pounders, ‘ulu maika, and moa pahe‘e.

Anticipated Impacts and Proposed Mitigation

The interviewees voiced their concerns and recommendations for the Project. Overall, those consulted viewed the Project positively and support improvements to the transfer station. One interviewee even said that the upgrades and improvements were necessary and long awaited. Participants did not think that the Project would affect any cultural sites or gathering practices. A concern was raised about the potential long term effects of the closed landfill with respect to shallow groundwater quality and environmental conditions. One interviewee recommended that more interviews should be conducted to gather additional information from kūpuna that grew up in the area since they are getting older. Overall, the three interviewees are supportive of the proposed improvements to KTS if proper measures are taken.

In sum, background research and oral history interviews identified several archaeological resources in the vicinity of the Project site. Whereas the Project site has been previously disturbed, it is not likely that vestiges of pre-contact archaeological sites remain on the surface. Likewise, because the area has been used as a dump for many years, pre-contact subsurface archaeological remains are not likely. The community should be kept informed on the improvement plans, and their concerns and recommendations should be considered during all phases of the proposed work.

3.7 Archaeological Resources

A Literature Review and Field Inspection was completed by Kleinfelder/GANDA for the areas of planned improvements at KTS in October 2020, and is included in *Appendix C.*

Existing Conditions

Several previous archaeological studies have been conducted in the vicinity of the Project site and are identified in *Figure 3.4.*

Archaeological findings within 0.5-miles of the Project site consist of a mix of archaeological findings from the traditional Hawaiian and post-Contact Hawaiian, or Historic Period. These include human remains near the coastline, stone enclosures, concrete and rock foundations, terraces, a platform, pathway, Japanese cemetery, World War II remains, historic trash dump, and sites associated with former plantation activities.

There are no known archaeological or historic resources at the Project site.

Anticipated Impacts and Proposed Mitigation

Based on the completed studies and the historic and modern land alterations within the current Project site, there is an extremely low probability of encountering traditional Hawaiian, early post-Contact Hawaiian, or Historic Period deposits at KTS. While there is a possibility that historic land use associated with dairy pasture improvements (i.e., filling of wetlands) may have disturbed or capped these older types of deposits, the more recent construction of the Kawailoa Landfill and Transfer Station has completely altered the study area, including massive earthworks to construct the landfill berms and existing load-out facilities.

Although the possibility of encountering historic properties within the study area cannot be entirely ruled out, based on a review of the environmental, cultural, and historical setting of the Project site, and the results of previous archaeological studies in the vicinity, no historic properties are likely to be present. Therefore, this study agrees with the findings of the previous 2002 EA (Group 70 International 2002) and State Historic Preservation District (SHPD) concurrence of the EA's determination (Log No. 28567; Doc No. 0111EJ09) that no historic properties will be affected during the proposed Project. In a letter dated March 11, 2021 (Doc. No. 2103SCH07), SHPD again concurs with the ENV's project effect determination of "No historic properties affected" for the current construction and site improvements project at KTS. No further archaeological work is recommended, however should historic properties by inadvertently discovered during the Project construction, SHPD will be notified immediately. Per SHPD, the HRS 6E historic preservation review process has ended, and Project initiation may proceed.

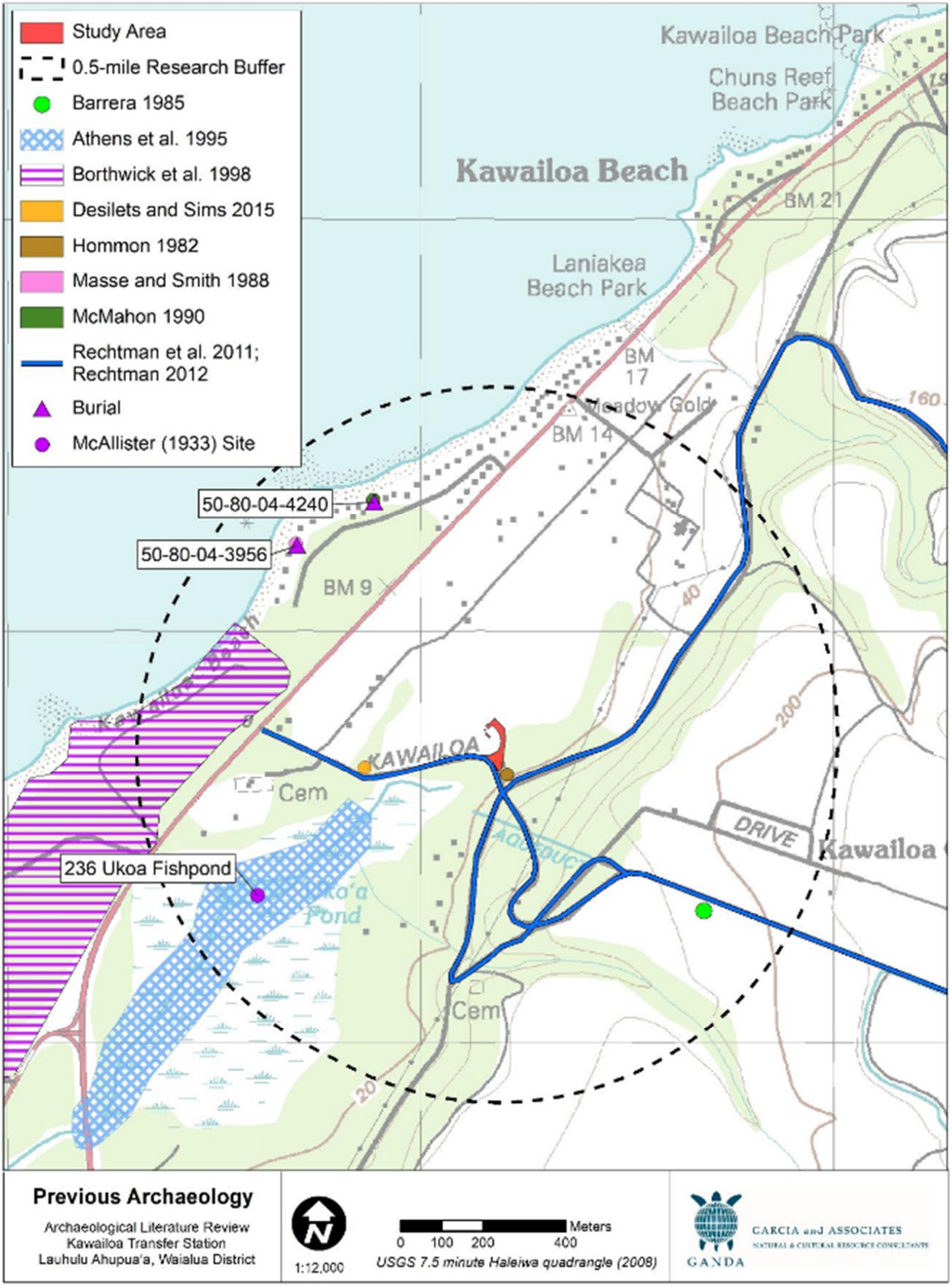

Figure 3.4 **Previous Archaeological Studies Conducted Within 0.5 Miles of the Study Area (Kleinfelder/GANDA)**

3.8 Socioeconomic Characteristics

Existing Conditions

The KTS area of planned improvements is situated within the Census Tract 100 (Kawailoa). This is a large area that spans from Kaukonahua Road (not including Hale‘iwa) to Waimea Bay and Elehana Stream, from the shoreline mauka to Poamoho Stream near the center of the island.

From 2013 to 2017, there were 1,172 households in Census Tract 100, with an average household size of 2.66 people. Families made up 78.8 percent of the households, with 41.7 percent of all households having one or more people under the age of 18; 13.7 percent of all households had one or more people 65 years and over.

Approximately 95.0 percent of the people living in Census Tract 100 from 2013 to 2017 were U.S. natives. Foreign-born residents came from different parts of the world, including Latin America (37.9 percent), Asia (33.1 percent), Oceania (21.9 percent), and Europe (7.1 percent). Among people at least five years old, 18.2 percent spoke a language other than English at home. Spanish was spoken by 7.7 percent, with Asian and Pacific Islander languages spoken by 6.9 percent, other Indo-European languages spoken by 3.6 percent, and 5.4 percent reported that they did not speak English "very well."

For people reporting one race alone, 57.5 percent were White; 15.9 percent were Black or African American; 9.6 percent were Native Hawaiian and Other Pacific Islander; 6.3 percent were Asian; and 0.1 percent were some other race. An estimated 10.6 percent reported two or more races. An estimated 13.5 percent of the people were Hispanic.

From 2013 to 2017, 95.0 percent of people 25 years and over had at least graduated from high school and 27.4 percent had a bachelor's degree or higher. An estimated 5.1 percent did not complete high school.

Of the population 16 and over, 41.3 percent were employed and 27.8 percent were not currently in the labor force. An estimated 57.5 percent of the people employed were private wage and salary workers; 37.2 percent were federal, state, or local government workers; and 5.3 percent were self-employed in their own business. In 2013 to 2017, the civilian employed population 16 years and older worked in the following industries: Public Administration (23.4 percent); Educational services, health care or social assistance (20.4 percent); Retail Trade (15.7 percent); Arts, entertainment, recreation, accommodation or food services (12.8 percent); and Construction (8.3 percent). The median income of households was $56,198.

The median age was 28.1 years. An estimated 19.5 percent of the population was under 18 years, 59.4 percent was 18 to 44 years, 13.2 percent was 45 to 64 years, and 7.9 percent was 65 years and older.

Anticipated Impacts and Proposed Mitigation

The planned improvements to KTS have no foreseeable negative impacts on the residential population of the area. The improvements are anticipated to slightly increase the residential haulers in the area. However, these marginal increases will not significantly change the character or culture of the North Shore area. There are no residential units being developed in conjunction with the KTS improvements, therefore the planned improvements will not affect land and housing speculation, property values of area homes, or affordable housing in the area.

The development of the KTS improvements will have some short-term economic benefits resulting from the construction of the facilities. Construction will be completed by a local contractor. Total construction cost for the facilities is estimated at approximately $5,264,000. Long-term economic benefits will also result from the employment of KTS staff that will support the green waste activities at the new facilities.

The planned improvements are not expected to result in significant impacts to the socioeconomics or environmental justice of the area. The surrounding area consists of low density residential area with numerous beach parks, open space and small-scale agricultural uses. Implementation of the planned improvements will not change the characteristics of KTS, but instead provide an additional service.

3.9 Visual Resources

Existing Conditions

Scenic view sheds around the Project site are identified in both the North Shore Sustainable Communities Plan (SCP) and the City's Coastal View Study (1987). *Figure 1.1* provides an aerial perspective of the general area. While lacking scenic value at the Project site, analysis of viewshed and view corridors from the two documents identified above, follows.

The North Shore SCP states that scenic views should be preserved of the mountains, coastal pali and shoreline areas including mauka and makai views seen from near shore waters and heavily traveled areas such as Kamehameha Highway, Farrington Highway and Kaukonahua Road. KTS is located on Kawailoa Road approximately 2,000 feet from Kamehameha Highway, with landscaping along the road making it impossible to see the transfer station until just before the turn into the property. This area of the highway is also heavily landscaped with large trees on either side, making it difficult to observe site features located behind them.

The Coastal View Study, prepared by the City's Department of Land Utilization in 1987, does not identify the Project site in its inventory of significant coastal views in the North Shore area. Located in Section D of the North Shore Viewshed Kawailoa, views are noted primarily as several breaks between residential lots on the makai side of Kamehameha Highway, further diminished by encroachment from vegetation and parked cars which often fill the view corridor.

Anticipated Impacts and Proposed Mitigation

KTS is an established transfer station shrouded by vegetation and is currently not visible from Kamehameha Highway. The natural environment surrounding KTS will be maintained. Two trees planned for removal do not currently offer screening of the site. The most significant structure planned for construction is the Facility Manager's Office. This will be similar in height to an existing overhang. Construction activities may be visible at the southern edge of the Project site, along Kawailoa Road. Views of construction operations on the site will be minimized by proper equipment and materials storage, minimized vegetation clearing, and sensitive site planning and building design. No significant adverse impacts to coastal views, scenic vistas or existing landscapes are anticipated.

3.10 Utilities

The following section provides key highlights and assesses potential impacts of infrastructure and utility needs.

Water

Existing Conditions

KTS has existing water service, provided by BWS. There is one existing water service consisting of a 1-inch water meter serving the site.

According to early consultation with BWS, the existing water system cannot provide adequate off-site fire protection for the proposed improvements. The nearest fire hydrant, Fire Hydrant No. C-00056, is located on Kamehameha Highway, which is more than 1,840 linear feet from the Project site. The water system improvements will be extensive.

No wells are planned at the Project site.

Anticipated Impacts and Proposed Mitigation

BWS will continue to supply water to the transfer station. If additional water is needed, KTS will be required to pay the BWS Water System Facilities Charges for resource development, transmission and daily storage. The proposed Project is subject to BWS Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit applications.

KTS will provide a private water system where all appurtenances, hydrant spacing, and fire flow requirements meet BWS standards. The on-site fire protection requirements will be coordinated with the Fire Prevention Bureau of the HFD, and civil drawings will be provided for review and approval. The construction schedule will be coordinated to minimize impact to the water system.

Water supplies will be conserved by implementing water efficiency and conservation measures, such as monitoring water use and water loss, fixing leaks, installing low flow plumbing fixtures, and drought tolerant landscaping.

Wastewater

Existing Conditions

There are no municipal sewer systems located in the vicinity of KTS. The on-site staff currently uses a portable toilet that is pumped on a regular maintenance schedule.

Anticipated Impacts and Proposed Mitigation

The improvements to KTS will require a wastewater holding tank. A wastewater holding tank will be used instead of an individual wastewater system, as the water table in this location is shallow. The holding tank will be sited in the location of the current portable toilet, next to the stair entry. The wastewater plans for the Project will be designed and constructed in accordance with applicable DOH requirements for wastewater systems (HAR §11-62).

Leachate

Existing Conditions

During precipitation events, rainwater can sometimes contact the waste material at the Project site and this water is considered potentially contaminated and recognized as "leachate." Leachate can be generated by liquids contained in the solid waste and/or precipitation entering the open sides of the existing transfer facility. The existing transfer station design and operation currently manages runoff water with a system of separate collection and proper management on-site.

Anticipated Impacts and Proposed Mitigation

With the Project improvements, leachate can be generated by liquids contained in the solid waste and/or stormwater blowing in the open sides of the transfer facility. Transfer station design and operation will ensure that potential contaminated water is collected separately, then properly managed on-site.

Leachate containment will be provided for the tipping building to prevent any travel of leachate outside the tipping area. Trench drains will be located on either side of the tipping floors. The tipping floor will be pitched to direct leachate runoff, if any, into the trench drain grates. The floor drain collection system will be piped outside of the building and connected to a leachate collection tank located outside the building below the pavement. The collection tank will be a double-walled, fiberglass tank with a 5,000 gallon holding capacity. Any collected leachate will be properly managed and disposed prior to creating a nuisance, health or environmental threat. Records will be maintained as to the quantity and management of all collected leachate. It is anticipated that the leachate will be properly collected and not affect water quality surrounding the Project site.

Solid Waste and Litter Control

Existing Conditions

Solid waste at the facility is dumped from the tipping floor directly into a transfer trailer located in the tipping pit below. The solid waste will be moved continually during the day as part of normal operations. Other items previously indicated as being collected outside the tipping area are stored in roll-off containers or in the case of scrap metal and white goods, on a designated paved area *(Figure 2.2).* Batteries are stored in a box.

Onsite staff regularly monitor the site for litter, and the site is bound by a low chain link fence to help control litter blowing in the wind. The trailers transporting refuse to the solid waste management and disposal facilities are fully covered with suitable covering to prevent fugitive dust and litter.

Anticipated Impacts and Proposed Mitigation

The current siting locations for the bulky items will be re-arranged to allow for necessary truck removal at the second waste tipping area *(Figure 2.8).* Green waste will be transferred to Hawaiian Earth Recycling in Wahiawā. Existing disposal procedures of the MSW and bulky items will continue.

Electrical Power and Communications

Existing Conditions

The electricity for KTS is currently provided by the Hawaiian Electric Company (HECO) via 12 kilovolt (kV) distribution lines extending from Kamehameha Highway along Kawailoa Road. There are electrical and communication boxes located adjacent to the fence next to Kawailoa Road and in the yard near the weigh scale, as well as security cameras posted in several locations throughout the site.

Anticipated Impacts and Proposed Mitigation

Electrical and communication boxes and light poles will need to be removed and relocated on site.

An additional electrical demand of 1,478 kWH per month is estimated for the new loadout and scale. Solar hot water panels will be installed to heat water supplied to the sink and shower, and additional PV panels will be installed to offset some electrical usage for the site. The solar hot water panel and electrical PV will be constructed over the roof of the new Facility Manager's Office. KTS will coordinate its additional electrical supply needs with HECO to avoid service disruption to local customers.

3.11 Roadways and Traffic Conditions

A Traffic Impact Analysis Report (TIAR) for the planned improvements at KTS was conducted by Austin Tsutsumi & Associates (ATA), Inc. (October 2020) and is included as *Appendix D.*

Existing Conditions

Access to the Project site is currently via an existing driveway along Kawailoa Drive, located off the main Kamehameha Highway. Kamehameha Highway (Route 83) is generally a north-south, two-way, two-lane, undivided State roadway and is part of the National Highway System (NHS). Kamehameha Highway is principal arterial roadway that provides regional connectivity along the windward coast between Kāneʻohe and Haleʻiwa. The posted speed limit on Kamehameha Highway is 35 mph in the vicinity of the Project. Kawailoa Drive is generally a two-way, east-west, County roadway with no posted speed limit. This roadway provides access to KTS and the residential areas nearby. The existing driveway along Kawailoa Drive will continue to provide access to the Project site. The TIAR studied traffic movement at the intersection of Kamehameha Highway and Kawailoa Drive and the existing driveway to the Project site along Kawailoa Drive.

Due to the prolonged disruptions to both residential and visitor traffic in the Haleʻiwa region as a result of the impacts of COVID-19, instead of collecting new traffic count data, most recently available traffic volume data from the DOT and existing land uses were used to estimate the existing 2020 traffic volumes at the study intersections. DOT collected data along Kamehameha Highway between Pohakuloa Way and Punalau Place and JP Leong Highway south of Kamehameha Highway between 2014 and 2019. Based on the data, the weekday PM peak hour vehicular traffic was generally observed from 3:30 p.m. to 4:30 p.m. Saturday peak hour vehicular traffic was generally observed to occur between 12:00 p.m. and 2:00 p.m. Observations of existing conditions in the study area were not conducted as part of this study as a result of the atypical traffic conditions.

The ENV provided existing daily trip estimates for KTS. The ENV estimates that roughly 200 household trips and four (4) transfer trailer trips to/from KTS occur each day.

The highway capacity analysis performed in this TIAR is based upon procedures presented in the Highway Capacity Manual 6th Edition (HCM), published by the Transportation Research Board. HCM defines the Level of Service (LOS) as "a quantitative stratification of a performance measure or measures representing quality of service." HCM defines the six (6) Levels of Service from the traveler's perspective, ranging from ideal or free-flow traffic operating conditions at LOS "A" to unacceptable or potentially congested traffic operating conditions at LOS "F" *(Table 3.1).*

Table 3.1 Level of Service Criteria

LOS	Control Delay (sec/veh)	Description
A	< 10	Control delay is minimal.
B	> 10 – 15	Control delay is not significant.
C	> 15 – 25	Stable operation. Queuing begins to occur.
D	> 25 – 35	Less stable condition. Increase in delays, decrease in travel speeds.
E	> 35 – 50	Unstable operation, significant delays.
F	> 50	High delays, extensive queuing.

Based off the analysis, all movements at the study intersections currently operate at LOS D or better during the weekday peak hours and Saturday midday peak hours of traffic.

To evaluate the potential impacts of traffic generated by the planned improvements on the surrounding highway system, it was necessary to first develop estimates of future traffic conditions in the area without the planned improvements. Background traffic growth in the study area was determined based on the O'ahu Regional Transportation Plan 2040 (ORTP) Travel Demand Forecasting Model (TDFM). The TDFM uses data from 2012 as its baseline before assigning land uses and socioeconomic data to Traffic Analysis Zones (TAZs) to generate and assign traffic across the roadway network. Based on the TDFM, a background growth rate of one percent was applied along Kamehameha Highway to determine Base Year 2022 conditions without the proposed improvements. Development in the area were also identified to account for increased traffic movement.

The TIAR identified four potential future development projects in the Project region which have been proposed but all lack final land use approvals and there is no certainty that these projects will be developed in the foreseeable future. For a conservative analysis of traffic conditions, however, these proposed projects are included in the Base Year 2022 conditions:

- Kamehameha Schools Town Center Commercial Development – 85,000 SF commercial development along with 50 rental apartments
- Hale'iwa Residential Village – 125 condominium/apartment units, 150 townhomes, and 75 single family homes
- Backyard Hale'iwa – 156 two-bedroom apartment units
- Papailoa Road and Kapaeloa Residential Developments – 130 single-family residential homes

It is anticipated that by 2022, traffic will have increased over the existing conditions due to the planned development in the study area. Under Base Year 2022 conditions, all movements at the study intersections are expected to continue operating similar to existing conditions with an expected increase in vehicle delay of one second or less except for the intersection at Kamehameha Highway and Kawailoa Drive in the westbound shared left turn/right turn lane where it is expected to operate at LOS E.

An analysis for the Future Year 2022 scenario (worst case condition with the above-listed planned developments) was used to represent the traffic conditions within the Project area with the full build-out of the Project. It is anticipated that the proposed improvements would generate an increase of two residential trips per hour per day and an increase of two transfer trailer trips per day. Under Future Year 2022 scenario, all movements at the Study Intersections are expected to continue operating similar to Base Year 2022 conditions during both the weekday peak hours and Saturday midday peak hours of traffic with an expected increase in vehicle delay of four seconds or less.

Anticipated Impacts and Proposed Mitigation

Construction period traffic will be limited in duration, mitigated by contractors combining worker vehicle use and off-peak equipment/materials delivery. Area representatives, neighborhood board, as well as the area residents will be notified regarding the construction period for the Project.

A permit will be required from the Highways Division to transport oversized/overweight equipment/loads within State highways facilities. During construction and upon completion of the Project, any damages/deficiencies along the roadways on Kawailoa Drive shall be repaired to City Standards and accepted by the City.

Under both Base Year 2022 conditions and Future Year 2022 conditions, movements at the study intersections are expected to continue to operate similar to the existing conditions with the exception of the Kamehameha Highway/Kawailoa Drive Intersection, which is expected to operate at LOS E and under capacity during PM and Saturday midday peak hours of traffic. Due to the low increase in traffic with the proposed improvements, no roadway improvements are recommended.

3.12 Air Quality and Odor Control

Existing Conditions

Air quality of the area of planned improvements at KTS is primarily affected by air pollutants from natural and/or vehicular sources. Natural sources of air pollution that may affect the air quality of the study area include aero-allergens from plants and wind-blown dust from bare soil areas. Emissions from on-site transfer trailers may be dispersed in the area of planned improvements.

There are no adverse odor conditions emanating from KTS. Refuse is hauled away by the transfer trailers at frequent enough intervals to prevent it from “rotting” onsite and causing an odor.

The U.S. Environmental Protection Agency (EPA) established the National Ambient Air Quality Standards (NAAQS) per the requirements of the Clean Air Act (last amended in 1990) to protect public health and welfare and prevent the significant deterioration of air quality. These standards account for seven major air pollutants: carbon monoxide (CO), nitrogen oxides (NO_X), ozone (O_3), particulate matter smaller than 10 microns (PM_{10}), particulate matter smaller than 2.5 microns ($PM_{2.5}$), sulfur oxides (SO_X), and lead. DOH CAB has also established State Ambient Air Quality Standards (SAAQS) for

six of these air pollutants to regulate air quality statewide. The SAAQS for carbon monoxide and nitrogen dioxide are more stringent than NAAQS. Hawai‘i also has a stringent standard for hydrogen sulfide, which is a common odorous pollutant associated with wastewater treatment facilities.

DOH CAB regularly samples ambient air quality at monitoring stations throughout the State and annually publishes this information. On O‘ahu, there are six monitoring stations. Currently, no monitoring station exists on the North Shore of O‘ahu. The DOH Air Monitoring Station nearest Hale‘iwa is located in the Kapolei Business Park at 2050 Lauwiliwili Street. This station was established to monitor SO_2, CO, NO_2, PM_{10} and $PM_{2.5}$.

In Hawai‘i, both Federal and State environmental health standards pertaining to outdoor air quality are generally met due to prevalent trade winds and the absence of major stationary sources of pollutant emissions. The relative absence of stationary pollutant sources in the area keep air quality in the Project site at levels well within the air quality standards.

Anticipated Impacts and Proposed Mitigation

Construction activities at KTS are not expected to generate significant air quality impacts. There will be limited grading required to establish these uses, with less than one acre affected by construction activities. Effective air pollution control measures will need to be provided to prevent or minimize any fugitive dust emissions caused by construction work from affecting the surrounding areas. A program of BMPs will be implemented during construction of the Project to minimize potential impacts. Some BMPs could include job site watering to minimize dust loss during construction, and proper maintenance of construction equipment and vehicles to minimize emissions.

If an odor problem develops it will be dealt with by the utilization of any one of many commercially available deodorizers if a mechanical or operational remedy cannot be implemented.

3.13 Noise

Existing Conditions

HAR §11-160 defines maximum permissible sound levels which are intended to protect, control, and abate noise pollution from stationary sources and construction, industrial, and agricultural equipment. As detailed below, maximum permissible sound levels in various zoning districts are set for excessive noise sources during the day (7 a.m. to 10 p.m.) and night (10 p.m. to 7 a.m.) at the property line where the activity occurs.

- Class A – Residential, conservation, preservation, public space, open space, or similar type zones – 55 decibel (dBA) (day) and 45 dBA (night)
- Class B – Multi-family dwellings, apartment, business, commercial, hotel, resort, or similar type zones – 60 dBa (day) and 50 dBa (night)
- Class C – Agriculture, country, industrial, or similar type zones – 70 dBa (day) and 70 dBA (night)

Noise generated by activities at the existing KTS facility include the movement of 18-wheel transfer trailer trucks and vehicular traffic of users.

Anticipated Impacts and Proposed Mitigation

Construction noise at the proposed location is not expected to be significant. Construction operations must comply with State DOH regulations and the City Noise Ordinance, which limits construction operations and resultant noise to daytime hours and specific maximum levels. The relative isolation of the transfer station also limits the effect of construction noise on the surroundings.

Noise from the operations of the proposed KTS improvements will remain about the same, as it is anticipated that the proposed improvements would generate an increase of two residential trips per hour per day and an increase of two transfer trailer trips per day.

3.14 Public Services

This section discusses the potential effects to public facilities and services at the project site and surrounding area.

Educational Facilities

Educational facilities located near the Project site include:

- Haleʻiwa Elementary School located at 67-020 Waialua Beach Road is approximately 2.6 mile away from the Project site.
- Waialua Elementary School located at 67-020 Waialua Beach Road is approximately 4.1 miles away.
- St. Michael School located at 67-340 Haona Street is approximately 5.0 miles away.
- Waialua High and Intermediate School located 67-160 Farrington Highway is approximately 5.0 miles away.

The Project is not expected to affect existing educational facilities near the Project site. No mitigation is proposed.

Recreational Facilities

Public beach parks provide open space and a natural outdoor environment for both residents of Hawaiʻi and tourists to enjoy. The public parks located nearest to KTS are Laniakea Beach (1.1 miles) Haleʻiwa Beach Park (1.2 miles) and Puaʻena Point Beach Park (1.2 miles). These public recreational facilities will not be affected by the KTS improvements.

Medical Facilities

Wahiawā General Hospital is located at 128 Lehua Street in Wahiawā. This hospital is located approximately 11.1 miles from the Project site. Kahuku Hospital is located approximately 13.5 miles from the Project site at 56-117 Pualalea Street in Kahuku. The proposed Project will not impact the handling of emergency medical services. No mitigation is proposed.

Police Services

The North Shore region is under the protection of the HPD. The area is part of HPD District 2 (Wahiawā/North Shore), which is located in Central Oʻahu and is bounded by Kipapa Gulch and Waiāhole Stream on the south, the Waiʻanae mountains on the west, the Koʻolau mountains on the east, and the shoreline from Kaʻena Point through Sunset Beach on the north. The district includes the communities of Mililani, Kunia, Wahiawā, Whitmore, Waialua, Haleʻiwa, Waimea, and Sunset Beach.

This Project will not impact HPD's operations or ability to provide adequate protection services to the surrounding community. The District 2 police protection should be adequate for the proposed Project operations. No adverse impacts or mitigation is proposed.

Fire Services

The North Shore region is served by four fire stations of the HFD, which include:

- Station 11: The Sunset Beach Fire Station is located at 59-719 Kamehameha Hwy in Sunset Beach
- Station 13: The Kahuku Fire Station is located at 56-460 Kamehameha Hwy in Kahuku
- Station 14: The Waialua Fire Station is located at 66-420 Haleʻiwa Road in Haleʻiwa
- Station 16: The Wahiawā Fire Station is located at 40 California Avenue in Wahiawā

Station 14 is located closest to the Project site, approximately 2.4 miles away.

This Project is not expected to impact HFD's operations or ability to provide fire protection services to the Project site and surrounding areas. The Project and fire department access roads will be designed to meet fire and building code requirements, including the National Fire Protection Association Uniform Fire Code dated 2012.

3.15 Potential Cumulative and Secondary Impacts

Cumulative impacts are the result of incremental effects of an activity when combined with other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Minor but collectively significant actions over a period of time can result in cumulative impacts to a place. The areas within KTS which are planned for improvements have been previously disturbed from the inception of Kawailoa Landfill operations. The improvements will take place in existing development footprints, and as a result, are not anticipated to generate significant cumulative impacts. The new planned or permitted development Projects located within the vicinity of KTS are listed in *Section 3.11,* which are anticipated to increase traffic on Kamehameha Highway, bringing the LOS from a D to an E or better.

Secondary effects are impacts that are associated with an activity but do not result directly from the activity. Overall, the KTS improvements will provide beneficial secondary effects for the North Shore communities by improving the accessibility for green waste recycling, and therefore reducing the amount of solid waste that is sent to H-POWER and increasing the amount of green waste available for mulch and compost production.

Section 4

Alternatives

Chapter 4

Alternatives

The following presents an analysis and discussion of potential alternatives to the planned improvements to KTS.

4.1 Alternative A – No-Action Alternative

The No-Action Alternative is the baseline against which all other alternatives are measured. "No-Action" refers to the future site conditions that would result should the planned improvements to KTS not proceed.

The No-Action Alternative would result in the continued use of the transfer station to collect and store materials before transport to H-POWER, the City's waste-to-energy facility. The City-collected green waste at KTS from the Waialua to Lāʻie area would be taken with the rest of the refuse to H-POWER and not be recycled. Residents self-hauling their green waste for recycling would have to travel to either the Lāʻie Refuse Convenience Center or Hawaiian Earth Recycling in Wahiawā.

In this alternative the tipping floor extension and the new facility supervisor's office would not be built. Although the alternative would have no direct adverse environmental impacts from project construction, No-Action means that North Shore residents would not have a means to locally recycle their green waste and the amount of material going to H-POWER would not be reduced.

4.2 Alternative B – North Side Loadout Area

Alternative B would locate the loadout on the northern side of the transfer station near the access stairs. This alternative would require less grading, paving and other site development than the proposed loadout on the eastern side.

However, in studying and planning for a north side loadout, it was determined that a cut would be needed into the recorded limits of the landfill, thereby potentially exposing the landfill contents. This would require much more environmental oversight and significantly increases the risk of a landfill fire. In addition, the existing power supply, internal electrical equipment, access stairs, office building, and hydraulic unit feed lines for the knuckle boom crane would have to be relocated. Turning and backing of self-haulers would require a 180-degree turn which would likely increase traffic pattern conflicts if both loadout areas were operated at the same time. The north side loadout alternative would require reverse routing of existing transfer truck patterns to eliminate opposing traffic patterns. The interior yard area would need to be used for transfer truck turning, reducing operational area. It could potentially require relocation of the existing white goods receiving and storage area either on or off-site.

Alternative B is not the most advantageous option due to the many constraints, relocation of facilities, and alteration of traffic patterns,

4.3 Alternative C – On-Site Green Waste Recycling

Under this alternative, an area of the closed landfill would be used to process the green waste. This would be the most intensive use of the site. The benefits of the alternative are that the green waste would not need to be transported for processing, and residents would have a nearby mulch supply.

The green waste would be stored in piles to age and to accumulate for batch processing. Storage piles would need to be monitored to ensure that decomposition does not heat the piles to an unsafe level. Periodically a large tub grinder would be brought on-site to grind the green waste into mulch. During the grinding operation, noise and dust would be generated. This alternative would also use a larger area than the proposed project and more extensive grading would be required to prepare the site. This alternative could include grading of the closed landfill area.

While this alternative offers savings in transporting the material, the costs associated with grinding the material on-site are many. Managing a mulching operation requires expertise and equipment that are usually cost effective at a larger scale. These factors coupled with impact of grading a large area for operations make this a less viable option.

4.4 Alternative D – Off-Site Collection

Alternative D would build a new off-site location for green waste collection and storage. With a new site the environmental impacts of construction, dust and noise might affect the surrounding community, especially if the site is located closer to a residential area. Traffic around the new site would increase with City and private vehicles accessing the facility. The convenience to residents would be decreased as many residents would need to travel to both facilities when they have green waste and refuse items for disposal.

If suitable off-site land could be found, this alternative would still provide a local opportunity for green waste recycling. However, operating a second transfer facility would create a loss of efficiency and increased costs for the City and taxpayers. The additional impacts of new site construction, the increased traffic, the loss of convenience and operating efficiency do not make this an attractive alternative.

Section 5

Plans and Policies

Chapter 5

Plans and Policies

The consistency of the KTS planned improvements with applicable State of Hawai‘i and City planning and land use objectives, policies, principles and guidelines are discussed below.

5.1 Hawai‘i State Land Use District Guidelines

Under HRS §205, all lands of the State are to be classified in one of four categories: urban, rural, agricultural, and conservation lands. The State Land Use Commission (LUC), an agency of the State Department of Business, Economic Development, and Tourism (DBEDT), is responsible for each district's standards and for determining the boundaries of each district (HRS §205-2(a)). Under this Chapter, all lands in Hawai‘i are classified into four land use districts: (1) Conservation, (2) Agricultural; (3) Urban, and (4) Rural.

KTS is in the State Land Use Agriculture District. Permissible uses within the agricultural districts are classified in HRS §205-4.5. Within the Agricultural district, all lands classified as LSB A or B are permitted to usages such as "Public, private, and quasi-public utility lines and roadways, transformer stations, communications equipment buildings, solid waste transfer stations, major water storage tanks, and appurtenant small buildings such as booster pumping stations, but not including offices or yards for equipment, material, vehicle storage, repair or maintenance, treatment plants, corporation yards, or other similar structures" (HRS §205-4.5(7)).

Discussion: As classified by the State of Hawai‘i LUC, KTS is situated within the State Agricultural District. Although the LSB for the Project site is rated D, the transfer station falls within permitted use of the State's Agricultural land use designation. The planned improvements are consistent with permitted uses stated in HRS §205-4.5 within the State Agricultural District.

5.2 Hawai‘i State Plan

The Hawai‘i State Plan (HRS §226) establishes a statewide planning system that provides goals, objectives, and policies that detail priority directions and concerns of the State of Hawai‘i. It is the goal of the State, under the Hawai‘i State Planning Act, to achieve the following:

- A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawai‘i present and future generations.
- A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.
- Physical, social, and economic well-being, for individuals and families in Hawai‘i, that nourishes a sense of community responsibility, of caring, and of participation in community life.

Specific objectives and policies of the State Plan that pertain to the planned improvements are as follows:

Section 226-11 Objectives and policies for the physical environment–land-based, shoreline, and marine resources:

(a) Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:
  (1) Prudent use of Hawai'i's land-based, shoreline, and marine resources.
  (2) Effective protection of Hawai'i's unique and fragile environmental resources.

(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:
  (1) Exercise an overall conservation ethic in the use of Hawai'i's natural resources.
  (2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.
  (3) Take into account the physical attributes of areas when planning and designing activities and facilities.
  (4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.
  (6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawai'i.
  (8) Pursue compatible relationships among activities, facilities, and natural resources.
  (9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.

Discussion: The improvement and subsequent operation of KTS will provide a facility in the North Shore area that promotes green waste separation and recycling. The center will be improved with minimal impacts to the surrounding environment. The site lacks significant natural vegetation and wildlife resources because of previous disturbances and existing uses. The improved facility will be a compatible and beneficial use for the surrounding North Shore area.

Section 226-14 Objectives and policies for facility systems—in general.

(a) Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.
  (1) Accommodate the needs of Hawai'i's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.
  (3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.

Discussion: The Project is consistent with this objective to plan for waste disposal systems that support state planning efforts. The Project results in improved, efficient handling of the green waste stream on the North Shore of O'ahu, without cost to the residential hauler.

Section 226-15 Objectives and policies for facility systems–solid and liquid wastes.

(a) Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:
(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.
(b) To achieve solid and liquid waste objectives, it shall be the policy of this State to:
(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.
(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.

Discussion: The ENV continually maintains and improves upon basic public health and sanitation standards with regard to solid wastes. The recycling of green waste employs a conservation ethic to solid waste handling. Commercial, government, homeowners' associations, and nonprofit organizations are required to use recycling facilities for disposal of all their green waste. Private vendors turn green waste into compost and other products, which are purchased and reused for landscaping, erosion control, soil amendments, and mulching materials. This reduction in the waste stream and beneficial reuse of green waste complies with the state objectives for reuse and recycling.

5.3 Hawai'i Coastal Zone Management Program

The Coastal Zone Management Act of 1972 (16 USC Section 1451), as amended through Public Law 104-150, created the coastal management program and the National Estuarine Research Reserve system. The coastal states are authorized to develop and implement a state coastal zone management program. The Hawai'i Coastal Zone Management (CZM) Program received federal approval in the late 1970's (HRS §205A-2). The objectives of the State's CZM Program are to protect valuable and vulnerable coastal resources such as coastal ecosystems, special scenic and cultural values and recreational opportunities. The objectives of the program are also to reduce coastal hazards and to improve the review process for activities proposed within the coastal zone.

Each county is responsible for designating an SMA that extends inland from the shoreline. Development within the SMA is subject to County approval to ensure the proposal is consistent with the policies and objectives of the Hawai'i CZM Program. A portion of the KTS site is within the SMA as delineated by the City and as such, requires an additional review under State CZM and County SMA rules. The following subsections examine the objectives of the Hawai'i CZM Program and the impacts of the planned improvements relative to the State CZM objectives and policies. Specific City SMA policies are also discussed in *Section 5.8.*

RECREATIONAL RESOURCES
Objective: Provide coastal recreational opportunities accessible to the public.

(A) Improve coordination and funding of coastal recreation planning and management.
(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:
- *Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;*
- *Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites and sandy beaches, when such resources will be unavoidably*

damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;

- *Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;*
- *Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;*
- *Encouraging expanded public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value;*
- *Adopting water quality standards and regulating point and non-point sources of pollution to protect and where feasible, restore the recreational value of coastal waters;*
- *Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, artificial reefs for surfing and fishing; and*
- *Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use Commissions, board of land and natural resources, county planning commissions, and crediting such dedication against the requirements of Section 46-6.*

Discussion: The proposed improvements will not impact any existing public coastal recreational opportunities since the Project site does not include any public access/trails or other coastal recreation opportunities. Access to coastal resources will not be affected by the proposed improvements with the site located mauka of Kamehameha Highway.

HISTORIC RESOURCES

Objective: Protect, preserve and, where desirable, restore those natural and man-made historic and pre-historic resources in the coastal zone management area that are significant in Hawai'i and American history and culture.

(A) Identify and analyze significant archaeological resources;
(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and
(C) Support state goals for protection, restoration, interpretation and display of historic resources.

Discussion: An Archaeological Literature Review and CIA were prepared to assess the impacts of the proposed improvements to historic and archaeological resources within the Project site. Findings from these surveys reflect that no historic properties will be affected with the proposed improvements. Additionally, this Project has been through the process of SHPD consultation and cultural stakeholders as part of the EA and complies with all applicable state and county laws. It was determined that there are likely no significant archaeological or historical resources on the Project site or in the immediately surrounding area. SHPD has approved the Project with conditions to ensure the appropriate handling and management of resources should they be uncovered during the construction phase.

SCENIC AND OPEN SPACE RESOURCES

Objective: Protect, preserve and where desirable, restore or improve the quality of coastal scenic and open space resources.

(A) Identify valued scenic resources in the coastal zone management area;
(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and
(D) Encourage those developments which are not coastal dependent to locate in inland areas.

Discussion: As discussed in *Section 3.11,* the planned improvements are not expected to adversely affect vistas or scenic resources. The topography of the transfer station site limits the effect site improvements will have on the visual environment. The Kawailoa landfill is directly adjacent to development on the site and serves to isolate site facilities. The site does not have significant stationary views as determined by the City Coastal View Study of 1987.

COASTAL ECOSYSTEMS
Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
(B) Improve the technical basis for natural resource management;
(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and
(E) Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.

Discussion: The proposed improvements to KTS will have no adverse effect on coastal ecosystems. Runoff will be controlled at the Project site, and will not affect waters leading to the coast. Mitigative measures to reduce runoff for the short-term construction and long-term use of the site are discussed in detail in *Section 3.3 Soils and Grading*.

ECONOMIC USES
Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

(A) Concentrate coastal dependent development in appropriate areas;
(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and
(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:
  (i) Use of presently designated locations is not feasible;
  (ii) Adverse environmental effects are minimized; and
  (iii) The development is important to the State's economy.

Discussion: The proposed improvements are taking place at an already developed inland location.

COASTAL HAZARDS

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and
(D) Prevent coastal flooding from inland projects.

Discussion: Although the Project is located within the Tsunami Evacuation Zone, current technology would allow enough warning to evacuate any users from the site to safer ground. The Project will not cause coastal flooding. The Project is located in flood zones XS and D, therefore Special Flood Hazard Area construction is not required.

MANAGING DEVELOPMENT

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and
(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Discussion: The KTS improvements are publicly motivated with the intention of providing a green waste recycling option to the North Shore community. The public will be informed of any potential short and long-term impacts of the Project through publication of this EA in Office of Environmental Quality Control's *The Environmental Notice,* a presentation of the Draft EA to the North Shore Neighborhood Board No. 27, and during a public hearing held during the SMA application process.

PUBLIC PARTICIPATION

Objective: Stimulate public awareness, education, and participation in coastal management.

(A) Promote public involvement in coastal zone management processes;
(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and
(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Discussion: A pre-consultation outreach effort followed by a public review/comment period is being conducted as part of this environmental review process. This allows stakeholders to participate in the review process. All formal comments received during the EA process are followed with response letters. A presentation before the North Shore Neighborhood Board No. 27 will be offered. The site location and scope does not require public awareness efforts for coastal management.

BEACH PROTECTION

Objective: Protect beaches for public use and recreation.

(A) Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;
(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities;
(C) Minimize the construction of public erosion-protection structures seaward of the shoreline;
(D) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor; and
(E) Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor.

Discussion: The planned improvements are not anticipated to result in adverse effects to local beaches, nor should it affect public use of nearby coastal resources and recreational opportunities.

MARINE RESOURCES

Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

(A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;
(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;
(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;
(D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and
(E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Discussion: The Project site is not located near the shoreline or beaches. The planned improvements will neither impact beaches nor warrant beach protection.

5.4 City and County of Honolulu Land Use Ordinance Guidelines

The purpose of the Land Use Ordinance (LUO) is to regulate land use in a manner that will encourage orderly development in accordance with adopted land use policies, including the County General Plan and development plans. The LUO is also intended to provide reasonable development and design standards. These standards are applicable to the location, height, bulk and size of structures, yard areas, off-street parking facilities, and open spaces, and the use of structures and land for agriculture, industry, business, residences or other purposes (ROH Chapter 21).

Discussion: The Project site is located within the City AG-1 Restricted Agriculture District and is a permitted use as a public use and structure. The proposed improvements to KTS will adhere to the development standards established for the AG-1 districted stated in the ROH §21.3.50-4, which states that the maximum height for a non-agricultural structure in the AG-1 district may be increased from

15 ft to up to 25 ft if height setbacks are provided. No structures will measure taller than 25 ft and all setbacks from every side and rear buildable area boundary line will be met.

5.5 City and County of Honolulu General Plan

The General Plan for the City was adopted in 1977 and has been subsequently amended (most recently in 2002). The General Plan is a comprehensive statement of the long-range social, economic, environmental and design objectives for the general welfare and prosperity of the people of O‘ahu. The objectives and policies are organized into 11 subject areas and are intended to guide and coordinate City land use plans and regulations, and budgeting policies and decisions for public facility capital improvements, operations and maintenance.

A Draft 2035 O‘ahu General Plan Update was published for public review in November 2012, and the Revised General Plan was submitted to the City Council in April 2018 for approval. A Final Revised General Plan Update is still pending. The planned improvements at KTS are consistent with the applicable objectives and policies of the existing City General Plan as amended in 2002, described below.

<u>NATURAL ENVIRONMENT</u>

Objective A: To protect and preserve the natural environment.

- *Policy 1. Protect O‘ahu’s natural environment, especially the shoreline, valleys, and ridges, from incompatible development.*
- *Policy 4. Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive land forms, and existing vegetation.*
- *Policy 6. Design surface drainage and flood-control systems in a manner which will help preserve their natural settings.*
- *Policy 7. Protect the natural environment from damaging levels of air, water, and noise pollution.*
- *Policy 8. Protect plants, birds, and other animals that are unique to the State of Hawai‘i and the Island of O‘ahu.*

<u>TRANSPORTATION AND UTILITIES</u>

Objective B: To meet the needs of the people of Oahu for an adequate supply of water and for environmentally sound systems of waste disposal.

Policy 3. Encourage the development of new technology which will reduce the cost of providing water and the cost of waste disposal.

Policy 5. Provide safe, efficient and environmentally sensitive waste-collection and waste-disposal services.

Policy 6. Support programs to recover resources from solid-waste and recycle wastewater.

<u>ENERGY</u>

Objective C: To fully utilize proven alternative sources of energy.

Policy 2. Support the increased use of operational solid waste energy recovery and other biomass energy conversion systems.

PHYSICAL DEVELOPMENT AND URBAN DESIGN

Objective A: To coordinate changes in the physical environment of O'ahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.

- *Policy 2. Coordinate the location and timing of new development with the availability of adequate water supply, sewage treatment, drainage, transportation, and public safety facilities.*
- *Policy 7. Locate new industries and new commercial areas so that they will be well related to their markets and suppliers, and to residential areas and transportation facilities.*
- *Policy 8. Locate community facilities on sites that will be convenient to the people they are intended to serve.*

CULTURE AND RECREATION

Objective B: To protect O'ahu's cultural, historic, architectural, and archaeological resources.

- *Policy 2. Identify, and to the extent possible, preserve and restore buildings, sites, and areas of social, cultural, historic, architectural, and archaeological significance.*
- *Policy 3. Cooperate with the State and Federal governments in developing and implementing a comprehensive preservation program for social, cultural, historic, architectural, and archaeological sites, buildings, and artifacts.*

GOVERNMENT OPERATIONS AND FISCAL MANAGEMENT

Objective A: To promote increased efficiency, effectiveness, and responsiveness in the provision of government services by the City and County of Honolulu.

- *Policy 1. Maintain City and County government services at the level necessary to be effective.*

Discussion: Improvements at KTS which include green waste recycling facilities will enhance the efficiency and promote recycling for residential haulers on the North Shore. The Project will occur in an inland area that has already been developed. Drainage will be kept on site and directed towards storm drains. Due to the limited vegetation and existing uses, wildlife communities are sparse on the site.

Once constructed, the new facilities will promote the importance of recycling and sustainable environmental practices within the North Shore community. By separating green waste from refuse, the transfer station is supporting the increased use of operational solid waste energy recovery and other biomass energy conversion systems. A local facility at Kawailoa will provide a convenient green waste drop-off point for residents of the North Shore. The siting of the improved facilities is considered ideal because of the site's existing use as a refuse transfer station, its relative isolation from residential areas and the surrounding community's awareness of the center.

Through this EA, an archaeological literature review and field study were conducted. It has been concluded that no archeological resources will be impacted by construction of the center as outlined in *Section 3.7* of this document. The correct permitting procedures are being conducted through SHPD.

The planned improvements will increase the efficiency of the KTS green waste handling procedures. The Proposed Action is necessary as part of the continued operation of an effective waste management system that serves the needs of O'ahu. While no increase in green waste volume is anticipated with implementation of the planned improvements, there will be more efficient on- and off-loading and transferring of green waste consistent with the objectives and policies for government operations.

5.6 City and County of Honolulu North Shore Sustainable Communities Plan

The island of O'ahu is divided into eight regional plan areas; six areas (including North Shore) are addressed in "sustainable communities plans" (SCP) in keeping with modest development patterns and rural characteristics. Each plan implements the objectives and policies of the General Plan and provides guidance on public policy, investment, and decision-making within each respective region. Together with the General Plan, they guide population and land use growth over a 20- to 25-year time span.

The 2010 North Shore SCP was adopted by the City Council via Ordinance 11-3 in May 2011. According to the 2010 North Shore SCP, the role of the North Shore in O'ahu's development pattern is to maintain the rural character, agricultural lands, open space, natural environment, recreation resources and scenic beauty of O'ahu's northern coast. The North Shore SCP proposed land use policies are intended to outline policies for future actions and agency decisions making. General policies are broad statements of intent that express the City's overall philosophy toward particular land uses. Planning principles and guidelines provide more specific guidance in terms of planning, design and implementation of projects and programs. The following describe areas where the proposed Project conforms to policies in the North Shore SCP. The proposed Project is designated as a Refuse Transfer Station on the North Shore SCP Public Facilities Map *(Figure 5.1).*

The Project is consistent with the applicable objectives and policies of the City North Shore SCP as described below.

<u>OPEN SPACE AND NATURAL ENVIRONMENT</u>

- *Protect and enhance significant natural features and ecologically sensitive lands, including mountain areas, shoreline areas, wetlands, fishponds, natural gulches, streams and drainageways. Provide protective buffer zones and setbacks around biologically sensitive areas to minimize habitat disturbance.*
- *Limit visual impacts from utility installations. Ensure that permitted utility installations are developed and/or managed in ways that maintain or enhance the natural, cultural, and scenic resource qualities of the surrounding landscape.*
- *Allow outdoor lighting at the minimum level necessary for public safety, security and community aesthetics consistent with the goals of energy conservation and environmental protection.*
- *Preserve and maintain all North Shore wetlands and wildlife habitats. When considering future activities/construction in the vicinity of biologically sensitive areas such as wetlands, the preferred sequence will be to:*
    - *avoid ecologically sensitive areas entirely;*
    - *if not possible, minimize potential project impacts; and*
    - *if negative impacts are unavoidable, require mitigation that will offset the loss of resources.*

<u>HISTORIC AND CULTURAL RESOURCES</u>

- *Consider the particular qualities of a site and its relationship to its physical surroundings when determining the appropriate treatment for a site. Determine the following on a site-by-site basis in consultation with the State Historic Preservation Division:*
    - *appropriate preservation methods;*
    - *appropriate delineation of site boundaries and setbacks; and*
    - *appropriate restrictions on uses and development of adjacent lands.*

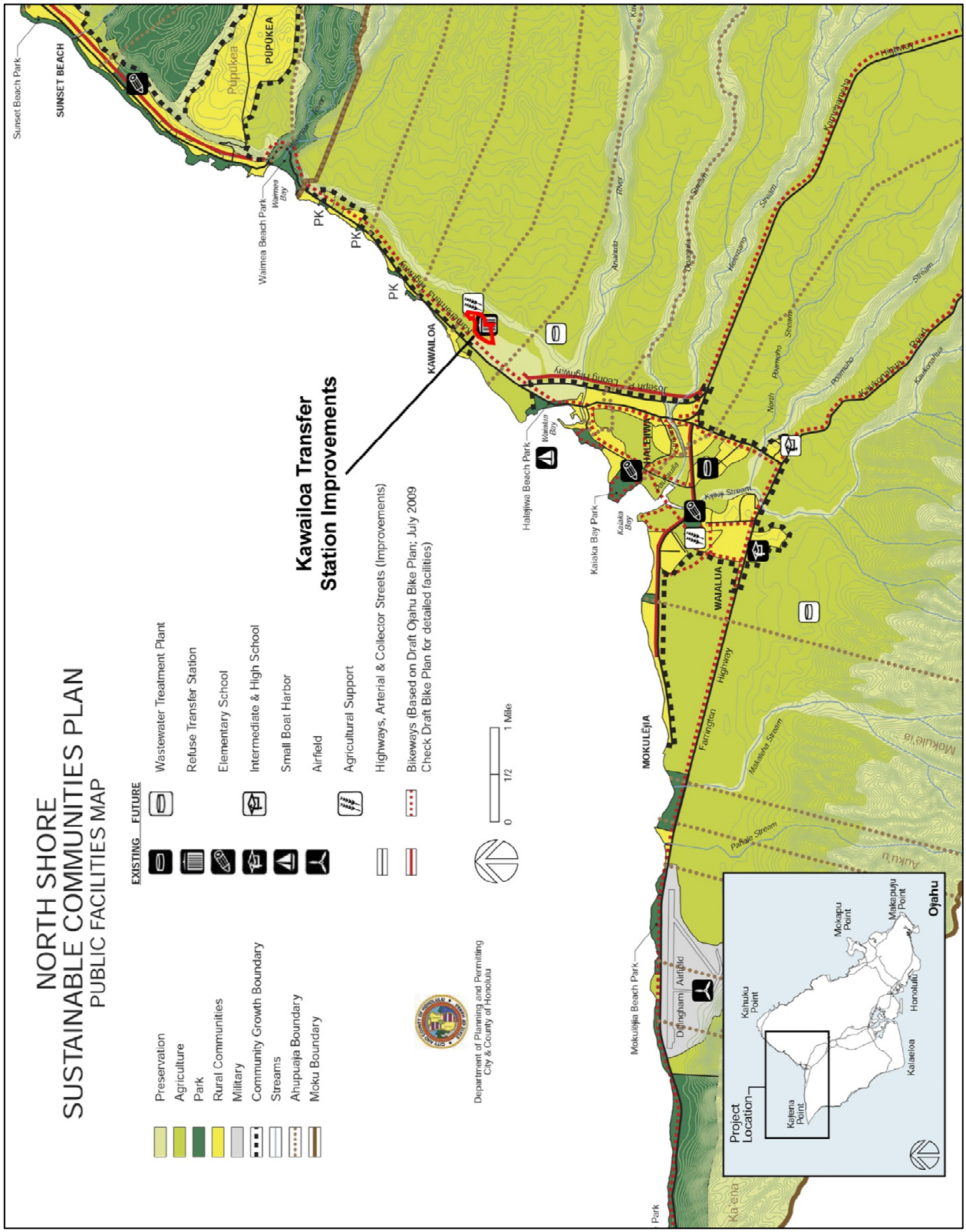

Figure 5.1 **City and County of Honolulu North Shore Sustainable Communities Plan**

INSTITUTIONAL USES

- *Co-locate social, social service institutions, and other public service agencies to provide convenient one-stop services to the region.*

PUBLIC FACILITIES AND INFRASTRUCTURE

Water Systems

- *Protect and preserve the region's water resources, including groundwater, streams, wetland areas, natural drainage systems, watershed areas and the shoreline and coastal areas. Ensure that the high quality of the region's nearshore and coastal waters is maintained to benefit recreation, the economy, the region's natural biological systems, and future generations.*
- *Integrate management of all potable and nonpotable water sources, including groundwater, surface water, storm water, and reclaimed water following City development of plans and adoption of appropriate management processes in accordance with City and State mandates.*
- *The BWS will either indicate that adequate potable and nonpotable water is available, deny, or will require/recommend conditions that should be included as part of any application for zone changes, master plans, subdivisions, and building permit approvals for a new residential or commercial development on the North Shore, in order to assure water service adequacy, dependability and efficiency.*
- *All developments are required to conserve water supplies by implementing water efficiency and conservation measures, such as monitoring water use and water loss, fixing leaks, installing low flow plumbing fixtures, drought tolerant landscaping, submetering, and soil moisture sensors in irrigation systems.*

Electrical Systems

- *Promote the use of renewable energy sources and energy conservation measures.*

Solid Waste Handling and Disposal

- *Promote recycling and other source reduction programs dedicated to minimizing the amount of solid waste generated.*
- *Expand recycling collection facilities and services, and public outreach and education programs that promote responsible waste management and source reduction*
- *Encourage recycling of regional green waste by establishing green waste facilities in an appropriate location, possibly integrated with, or adjacent to the Kawailoa Refuse Transfer Station.*

DRAINAGE SYSTEMS

- *To the extent possible, integrate planned improvements to the drainage system into the regional open space network.*
- *Require all structural and land improvements to provide adequate drainage and flood mitigation measures to reduce storm runoff and flood hazard.*
- *Regularly maintain and clean drainageways and flood mitigation structures of debris to ensure that they achieve the purpose for which they were designed.*
- *Employ best management practices to minimize runoff from existing conservation and agricultural land uses, and other areas that may generate sediment and debris.*

Discussion: Planned improvements at KTS will be sure to protect adjacent ecologically sensitive lands by keeping stormwater on-site and directing it into existing storm drains. The on-site drainageways will be regularly maintained and cleaned of debris to ensure that they achieve the purpose for which they were designed. BMPs will be employed to minimize runoff. KTS is located in an area that is not visible from a distance and the improvements will maintain the natural, cultural, and scenic resource qualities of the surrounding landscape. Outdoor lighting will be used when necessary to maintain security on-site.

Through this EA, an archaeological literature review and field study were conducted. It was determined that there are likely no significant archaeological or historical resources on the Project site or in the immediately surrounding area due to previous development.

The planned improvements will properly manage stormwater to protect and preserve the region's water resources. The Board of Water Supply will indicate whether adequate potable water is available during the permitting stage. Water supplies will be conserved by implementing water efficiency and conservation measures, such as monitoring water use and water loss, fixing leaks, installing low flow plumbing fixtures, and drought tolerant landscaping. In addition, KTS will promote the use of renewable energy sources and energy conservation measures with the installation of solar photovoltaic panels.

Co-locating the green waste recycling option with the existing transfer station provides a convenient one-stop service to the North Shore region. Improving KTS with green waste collection facilities promotes recycling and will reduce the amount of solid waste collected and disposed by the City. The result will be a lower level of solid waste disposed and a smaller quantity of waste by-product present on Oʻahu.

5.7 City and County of Honolulu Special Management Area Guidelines

KTS is partially located within the SMA *(Figure 1.5 and 5.2),* which was established to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawaiʻi. Special controls on development within the SMA are necessary to avoid permanent loss of valuable resources and foreclosure of management options. The review guidelines of ROH §25-3.2 are used by the DPP and the City Council for the review of developments proposed in the SMA. These guidelines are derived from HRS §205A-26.

(1) All Development in the SMA shall be subject to reasonable terms and conditions set by the council in order to ensure that:

- *Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas, and natural reserves is provided to the extent consistent with sound conservation principles;*
- *Adequate and properly located public recreation areas and wildlife preserves are reserved;*
- *Provisions are made for solid and liquid waste treatment, disposition, and management which will minimize adverse effects upon special management area resources; and*
- *Alteration to existing land forms and vegetation, except crops, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation or failure in the event of an earthquake.*

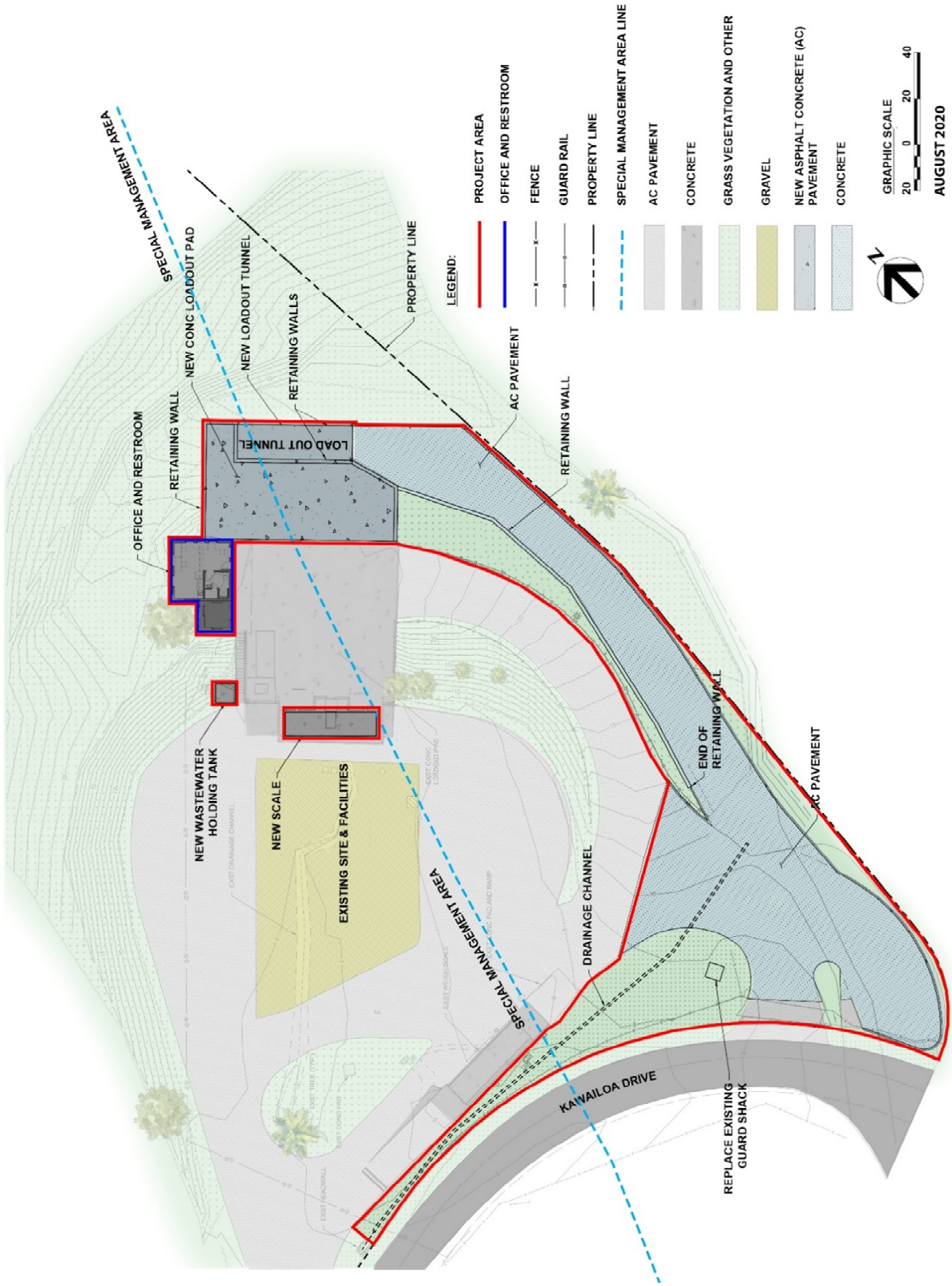

Figure 5.2 **Kawailoa Transfer Station Conceptual Site Plan Within the SMA**

(2) No development shall be approved unless the council has first found that:

- *The development will not have any substantial, adverse environmental or ecological effect except such adverse effect is minimized to the extent practicable and clearly outweighed by public health and safety, or compelling public interests. Such adverse effect shall include, but not be limited to, the potential cumulative impact of individual developments, each one of which taken in itself might not have a substantial adverse effect, and the elimination of planning options;*
- *The development is consistent with the objectives and policies set forth in Section 25-3.2 and area guidelines contained in Section 205A-26, Hawai'i Revised Statutes; and*
- *The development is consistent with the County General Plan, Development Plans, Zoning and subdivision codes and other applicable ordinances.*

(3) The Council shall seek to minimize, where reasonable:

- *Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough or lagoon;*
- *Any development which would reduce the size of any beach or other area usable for public recreation;*
- *Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the special management area and the mean high tide line where there is no beach;*
- *Any development which would substantially interfere with or detract from the line of sight toward the sea from the State highway nearest the coast; and*
- *Any development which would adversely affect water quality, existing areas of open water free of visible structure, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.*

Discussion: The proposed action will involve facilities improvements within the SMA and require an SMA Use-Major Permit, as the cost of development within the SMA will exceed $500,000. The proposed Project will be consistent with this SMA policy because no public areas or wildlife preserves are affected. Water and scenic resources will not be adversely affected. The consistency of the proposed action with the objectives and policies of the Hawai'i State Plan, County General Plan and the North Shore SCP are described earlier in *Section 5.2, 5.5 and 5.6*. Generally, these review guidelines do not apply to the proposed action. The Project will not adversely affect water quality, as all of the site improvements are proposed for areas containing existing refuse transfer uses.

Section 6

Findings Supporting the Anticipated Determination

Chapter 6

Findings Supporting the Anticipated Determination

6.1 Anticipated Determination

Based on a review of the significance criteria outlined in HRS §343 and HAR §11-200.1-13, the planned improvements to KTS are not anticipated to result in significant adverse effects on the natural or human environment. A FONSI is anticipated.

6.2 Reasons Supporting the Anticipated Determination

The potential impacts of the KTS improvements have been fully examined and discussed in this EA. As stated earlier, there are no significant environmental impacts expected to result from the planned improvements. This determination is based on the assessments as presented below for criterion (1) to (13).

(1) Irrevocably commit a natural, cultural or historic resource.

The Project does not involve a loss or destruction of natural or cultural resources as discussed in the previous sections. The Project site has been previously disturbed by the construction and generation of the landfill and of the transfer station.

(2) Curtail the range of beneficial uses of the environment.

The improvements to KTS will not curtail the range of beneficial uses of the environment. Existing uses conform to existing land use designations. The planned improvements will be made on land that is set aside for handling the North Shore's solid waste. As land abutting a closed landfill, this is a beneficial use to the environment. The improved facility at KTS promotes sound environmental practices and the reduction of waste by-products.

(3) Conflict with the State's environmental policies or long-term environmental goals established by law.

The planned improvements at KTS does not conflict with state environmental policies in HRS §344, and any revisions thereof and amendments thereto, court decision, or executive orders.

(4) Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and State.

The proposed action will generate short-term economic benefits from construction activity and the long-term economic benefits of waste and transport cost reduction. No impacts to social welfare or cultural practices are anticipated.

(5) Have a substantial adverse effect on public health.

The planned improvements to KTS will be consistent with existing land uses and are not expected to affect public health. However, there will be temporary short-term impacts to air quality from possible dust emissions and temporary degradation of the acoustic environment in the immediate vicinity resulting from construction equipment operations. Dust emissions and acoustic noise resulting from construction equipment operations will be mitigated by complying with DOH Administrative Rules and implementing BMPs to minimize temporary impacts. The reduction in landfill disposal needs by recycling green waste provides a benefit. Currently, most of the North Shore green waste is disposed of at H-POWER.

(6) Involve adverse secondary impacts, such as population changes or effects on public facilities.

This Project will have no impact on population. Other existing public facilities will not be affected.

(7) Involve a substantial degradation of environmental quality.

Development of the improved green waste collection at KTS will have a positive effect on environmental quality in the North Shore area. Short-term construction activity may briefly affect the environmental quality of the immediate area, but construction activities will follow strict erosion control, noise reduction and air quality measures. The Project site is an existing transfer station at a closed landfill where disturbance to the environment has already occurred. Little or no new impacts will result from the facility improvements.

(8) Be individually limited but cumulatively have substantial adverse effect upon the environment or involved a commitment for larger actions.

The planned improvement at KTS will have a positive effect on the surrounding environment and region for reasons discussed in the previous sections. Development of the improved facilities does not require a commitment for larger actions or development, and it does not induce further growth.

(9) Have a substantial adverse effect on a rare, threatened or endangered species, or its habitat.

No rare, threatened, or endangered species or habitats are present on-site or will be substantially affected by this Project.

(10) Have a substantial adverse effect on air or water quality or ambient noise levels.

General temporary impacts associated with construction are identified in *Section 3.0* of this EA. Mitigation measures which are outlined in this EA will be applied during the on-going construction activity. No detrimental long-term impacts to air, water, or acoustic quality are anticipated with the planned improvements.

(11) Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters.

The development of the Project is limited to existing developed areas and has no potential significant effect on an environmentally sensitive area. The Project is not likely to suffer damage by being located in an environmentally sensitive area such as a food plain, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters. Although located within the tsunami evacuation zone, minimal impact is anticipated.

(12) Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in county or state plans or studies.

The proposed Project will not affect scenic vistas and view planes identified in county or state plans or studies.

(13) Require substantial energy consumption or emit substantial greenhouse gases.

The energy consumption levels will increase by an estimated 1,478 kWH per month, equivalent to less than two households, which is not a substantial energy consumption. Solar hot water panels will be installed to heat water supplied to the sink and shower, and additional PV panels will be installed to offset some electrical usage on-site.

6.3 Determination Pursuant to HRS Chapter 343

Based on the above findings, further evaluation of the Proposed Action's impacts through the preparation of an Environmental Impact Statement is not warranted. The EA recommends mitigation measures to alleviate impacts where such impacts are identified. A FONSI is anticipated.

The planned improvements will result in beneficial environmental impacts to the community by consolidating refuse and green waste disposal at a single location. This will result in diverting recyclable green waste from the solid waste stream. Waste hauling time will also be reduced as compared to the existing operations as a portion of the waste products typically transferred to H-POWER in Kalaeloa will now be transferred to Hawaiian Earth Recycling in Wahiawā. In summary, the planned improvements will provide a public benefit while resulting in minimal impacts to the surrounding environment.

Section 7

List of Agencies, Organizations and Individuals Receiving Copies of the EA

Chapter 7

List of Agencies, Organizations and Individuals Receiving Copies of the EA

7.1 Consultation List

Early consultation on the planned improvements to Kawailoa Transfer Station was carried out on August 20, 2020 with various agencies and stakeholders as part of the scoping process for this Project. The Draft EA was published in *The Environmental Notice* on January 23, 2021. Publication of the Draft EA was followed by a 30-day public comment period. A total of 13 State and City agencies or agency divisions commented on the Project. Parties contacted in preparation of the Draft EA process, comments received, those that were provided an opportunity to review the Draft EA, and Draft EA comments received are identified in *Table 7.1* below. Comment letters received during these consultation processes are also provided following this list.

Table 7.1 Agencies, Organizations and Individuals Receiving Copies of the EA

Respondents and Distribution	Early Consultation	Received Draft EA	Draft EA Comments Received	Receiving Final EA/ FONSI
Federal Agencies				
U.S. Army Corps of Engineers	X	X	X	X
U.S. Department of Agriculture, Natural Resources Conservation Service	X	X		X
U.S. Department of the Interior, Fish and Wildlife Service	X	X		X
State of Hawai'i Agencies				
Department of Health (DOH), Environmental Health Administration	X	X		X
DOH, Clean Air Branch	X	X		X
DOH, Clean Water Branch	X	X		X
DOH, Disability and Communication Access Board		X		X
DOH, Environmental Management Division	X	X		X
DOH, Safe Drinking Water Branch	X	X	X	X
DOH, Solid and Hazardous Waste Branch	X	X		X
Department of Land and Natural Resources (DLNR), Land Division		X	X	X
DLNR, Division of Aquatic Resources		X		X

Table 7.1 Agencies, Organizations and Individuals Receiving Copies of the EA				
Respondents and Distribution	Early Consultation	Received Draft EA	Draft EA Comments Received	Receiving Final EA/ FONSI
DLNR, Department of Forestry and Wildlife	X	X	X	X
DLNR, Engineering Division			X	X
Department of Transportation	X	X	X	X
Office of Hawaiian Affairs	X	X		X
Office of Planning	X	X		X
City and County of Honolulu Agencies				
Board of Water Supply	X	X	X	X
Department of Design and Construction	X	X	X	X
Department of Facility Maintenance	X	X	X	X
Department of Planning and Permitting	X	X	X	X
Department of Transportation Services	X	X	X	X
Honolulu Fire Department	X	X	X	X
Honolulu Police Department	X	X	X	X
Office of Climate Change, Sustainability, and Resiliency	X	X		X
Elected Officials				
Senator Gil Riviere – State Senate District 23	X	X		X
Representative Sean Quinlan – State House District 47	X	X		X
Mayor Kirk Caldwell		X		
Mayor Rick Blangiardi*				X
Councilmember Heidi Tsuneyoshi – Honolulu City Council District 2	X	X		X
North Shore Neighborhood Board No. 27	X	X		X
Libraries				
Hawai‘i State Library		X		X
Waialua Public Library		X		X

** Former Mayor Kirk Caldwell received the Draft EA.*

7.2 Summary of Comments

A summary of comments received during the Draft EA comment period by major topics and associated responses is provided in *Table 7.2* below. Refer to comment letters located after *Table 7.2.*

Table 7.2 DEA Summary of Comments and Responses		
Comments	**Commenter**	**Responses**
Construction Impacts and Best Management Practices (BMPs)		
During construction and upon completion of the project, any damages/deficiencies along the City maintained portion of the roadway on Kawailoa Drive (Kamehameha Highway to the cattle gate) shall be repaired to City standards and accepted by the City and at no cost to the City and County of Honolulu.	DFM	As discussed in *Section 3.11 Roadways and Traffic Conditions,* ENV understands that they are responsible for damages to Kawailoa Drive caused by the proposed improvements.
The Project must comply with the prevailing soil erosion and storm water quality standards and the Rules Relating to Water Quality. This will be confirmed during the development and building permit stage of development. However, the Final EA should describe the types of best management practices and other measures that will be employed to comply with these requirements.	DPP	According to the City Rules Relating to Water Quality §3-14(f), KTS is considered a Category 3 project as it requires a grading, grubbing, or stockpiling permit and is 7,500 square feet or more, but the total area graded or stockpiled upon is less than 7,500 square feet. The Project will require an Erosion and Sediment Control Plan (ESCP). ESCPs must include BMPs to address and achieve erosion control, sediment control, and good housekeeping practices as outlined in the City Rules Relating to Water Quality §3-22(c). *Section 3.2 Soils, Topography and Grading* has been updated in the FEA to include this information.
Street Condition. Any damage to the existing roadway and sidewalk area caused by the project should be restored to its original or better condition.	DTS	As discussed in *Section 3.11 Roadways and Traffic Conditions,* ENV understands that they are responsible for damages to Kawailoa Drive caused by the proposed improvements. There are no sidewalks in the area.
Clean Streets. Best Management Practice controls should be included at the construction site to prevent trailing of dirt and debris on Kawailoa Drive and City roadways.	DTS	The addition of the BMP controls to minimize the trailing of dirt and debris on Kawailoa Drive and City roadways has been added to *Section 3.2 Soils, Topography and Grading.*
Special Management Area (SMA)		
A portion of the Project site is within the Special Management Area (SMA) and Section 2.6 of the Draft EA suggests an SMA Use Permit is required for the Project. The Final EA should include a figure showing the SMA boundary on a site plan to clearly show which elements of the Project are within the SMA. The Final EA should also specify whether any elements of the Project would not be considered "development" for purposes of Section 25-1.3, Revised Ordinances of Honolulu. Finally, a cost estimate of those elements of the Project that are in the SMA and are considered "development" should be provided, unless it is clear the cost exceeds $500,000.	DPP	The Final EA includes *Figure 5.2* showing the SMA boundary on the proposed site plan. Development within the SMA will exceed $500,000.

Table 7.2 DEA Summary of Comments and Responses		
Comments	**Commenter**	**Responses**
Development Standards		
Section 5.4 of the Draft EA states the Project will comply with the development standards of the AG-1 Restricted Agricultural District. The Final EA should include a discussion of whether there is a possibility that the equipment or structures will ultimately need to exceed the height limit. If that is a possibility, a Zoning Waiver should be added to the list of potentially necessary permits and approvals.	DPP	According to ROH §21-3.50-4(c), the maximum height for a non-agricultural structure in the AG-1 district may be increased from 15 ft to up to 25 ft if height setbacks are provided. No structures will measure taller than 25 ft and all setbacks from every side and rear buildable area boundary line will be met. *Section 5.4 City and County of Honolulu Land Use ordinance Guidelines* has been updated in the FEA to reflect this information.
Disability and Communication Access Board (DCAB). Project plans (vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by DCAB to ensure full compliance with Americans with Disabilities Act (ADA) requirements.	DTS	ENV understands that DCAB will be reviewing the project during the design and building permit stage to ensure compliance with ADA requirements.
Traffic Impacts		
Transportation Impact Assessment (TIA). The applicant should monitor the development status so that should circumstances change, either project based or in the project environs, the TIA can be modified to reflect the change. Of particular interest is the intersection of Kawailoa Drive and Kamehameha Highway. The applicant shall submit all native files (e.g., Synchro, Excel, etc.) for the raw multi-modal counts and accompanying analyses to the Regional Planning Branch (RPB) at dtsplanningdiv@honolulu.gov. Please refer to the Department of Transportation Services (DTS) TIA Guide for multimodal assessment tools and recommended analyses. The TIA Guide can be found at http://www4.honolulu.gov/docushare/dsweb/View/Collection-7723.	DTS	The ENV Project team will maintain awareness of the project scope and new development plans in the area which may affect traffic flow at the highway intersection. The traffic consultant for the Project will submit the technical traffic data directly to DTS.
Neighborhood Impacts. The area representatives, neighborhood board, as well as the area residents, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.	DTS	Area representatives, neighborhood board, as well as the area residents will be notified regarding the construction period for the Project. This information has been added to *Section 3.11 Roadways and Traffic Conditions.*

Table 7.2 DEA Summary of Comments and Responses		
Comments	**Commenter**	**Responses**
Based on the DEA and the conclusions of the Traffic Impact Analysis Report dated December 2, 2020, the operation and the proposed work does not appear to generate significant traffic impacts onto the State facility.	DOT	ENV acknowledges this comment.
Fire Code		
Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet (46 meters) from fire department access roads as measured by an approved route around the exterior of the building or facility. (National Fire Protection Association [NFPA] 1; 2012 Edition, Sections 18.2.3.2.2 and 18.2.3.2.2.1.) A fire department access road shall extend to within 50 feet (15 meters) of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1; 2012 Edition, Section 18.2.3.2.1.)	HFD	ENV will design fire department access roads to meet the requirements of the National Fire Protection Association Uniform Fire Code dated 2012. This information has been added to *Section 3.14 Public Services.*
A water supply approved by the county, capable of supplying the required fire flow for fire protection shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet (45,720 millimeters) from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ [Authority Having Jurisdiction]. (NFPA 1; 2012 Edition, Section 18.3.1, as amended.)	HFD	ENV has been made aware that the existing water system cannot provide adequate off-site fire protection for the proposed improvements. The nearest fire hydrant, Fire Hydrant No. C-00056, is located on Kamehameha Highway, which is more than 1,840 linear feet from the Project site. The water system improvements will be extensive. As discussed in *Section 3.10 Utilities,* KTS will provide a private water system where all appurtenances, hydrant spacing, and fire flow requirements meet county standards. The on-site fire protection requirements will be coordinated with the Fire Prevention Bureau of the HFD. The construction schedule will be coordinated to minimize impact to the water system.
The unobstructed width and unobstructed vertical clearance of a fire apparatus access road shall meet county requirements. (NFPA 1; 2012 Edition, Sections 18.2.3.4.1.1 and 18.2.3.4.1.2, as amended.)	HFD	The unobstructed width and unobstructed vertical clearance of a fire apparatus access road will meet county requirements.

Table 7.2 DEA Summary of Comments and Responses		
Comments	**Commenter**	**Responses**
Submit civil drawings to the HFD for review and approval.	HFD	Civil drawings for the improvements at KTS will be provided to the HFD for review and approval. This statement has been added to *Section 3.10 Utilities.*
The existing water system cannot provide adequate off-site fire protection to the transfer station improvement project. The nearest fire hydrant, Fire Hydrant No. C-00056, is located on Kamehameha Highway, which is more than 1,840 linear feet from the project site. The water system improvements are extensive.	BWS	ENV understands that the existing water system is not adequate to support off-site fire protection to the project site with the proposed improvements. As discussed in *Section 3.10 Utilities,* ENV will provide a private water system where all appurtenances, hydrant spacing, and fire flow requirements meet BWS standards.
The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.	BWS	ENV acknowledges this comment as stated in *Section 3.10 Utilities.*
Waters of the United States and Flood Zone		
A Department of the Army permit is needed if work occurs in Waters of the United States (WOTUS) under Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act. When your project is being developed, we ask that you identify areas that may fall within the Corps jurisdiction as WOTUS such as streams, rivers, and wetlands. Our first requirement is to avoid impacts to our WOTUS. If impacts are unavoidable (such as a stream crossing), then a permit will be needed from the Corps. If a permit is needed from the Corps, then would require an application be provided. We must also evaluate the project for any impacts to resources such as threatened or endangered species, historic properties, and/or essential fish habitat, and consult if necessary. A permit is not required if all work being done is located in uplands.	USACE	*Section 3.3 Drainage and Hydrology* discusses that no jurisdictional waters are currently present on the Project site. During the processing of the transfer station SMP (84/SMA-78), a portion of the Project site had been designated as a wetland. At that time, a Department of Army Permit (DA) was issued to allow fill and construction of the transfer station. In a letter dated December 10, 2002, the Army Corps indicated that no further DA permit would be required for the proposed green waste recycling improvements.
The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).	DLNR, ED	A discussion on flood zones is provided in *Chapter 3.4 Natural and Manmade Hazards* of the EA.

Table 7.2 DEA Summary of Comments and Responses		
Comments	**Commenter**	**Responses**
Flora and Fauna		
The State listed Hawaiian Hoary Bat or ʻŌpeʻapeʻa *(Lasiurus cinereus semotus)* has the potential to occur in the vicinity of the project area and may roost in nearby trees. If any site clearing is required this should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW.	DLNR, DOFAW	ENV is aware of the potential for ʻŌpeʻapeʻa to occur in the vicinity of the project area. A discussion on Hawaiian Hoary Bat mitigation measures is provided in *Chapter 3.5 Flora and Fauna* of the EA.
DOFAW recommends minimizing the movement of plant or soil material between worksites, such as in fill. Soil and plant material may contain invasive fungal pathogens (e.g. Rapid ʻŌhiʻa Death), vertebrate and invertebrate pests (e.g. Little Fire Ants, Coconut Rhinoceros Beetles), or invasive plant parts that could harm our native species and ecosystems. We recommend consulting the Oʻahu Invasive Species Committee at (808) 266-7994 in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.	DLNR, DOFAW	ENV understands that DOFAW recommends minimizing the movement of plant and soil materials between worksites. A discussion on fungal pathogen mitigation is provided in *Chapter 3.5 Flora and Fauna* of the EA.
State listed waterbirds such as the Hawaiian Duck (Anas wyvilliana), Hawaiian Stilt (Himantopus mexicanus knudseni), Hawaiian Coot (Fulica alai), and Hawaiian Common Gallinule (Gallinula chloropus sandvicensis) have the potential to occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, please contact the Oʻahu DOFAW Office at (808) 973-9778.	DLNR, DOFAW	A discussion on waterbird mitigation measures is provided in *Chapter 3.5 Flora and Fauna* of the EA.

Table 7.2 DEA Summary of Comments and Responses		
Comments	**Commenter**	**Responses**
DOFAW is concerned about attracting vulnerable birds to areas that may host nonnative predators such as cats, rodents, and mongoose. Additionally, improvements to the facility are likely to increase human and operational activity and may generate more predator attractants. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.	DLNR, DOFAW	A discussion on minimizing predator presence is provided in *Chapter 3.5 Flora and Fauna* of the EA.
We note that artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade artifacts or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea. For illustrations and guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawai‘i please visit: https://d1nr.hawaii.Nov/wildlife/files/2016/03/DOC439.pdf.	DLNR, DOFAW	A discussion on minimizing the effects of nighttime lighting on seabirds is provided in *Chapter 3.5 Flora and Fauna* of the EA.
Potable and Non-potable Water		
All new public water systems are required to demonstrate and meet minimum capacity requirements prior to their establishment. This requirement involves demonstration that the system will have satisfactory technical, managerial, and financial capacity to enable the system to comply with safe drinking water standards and requirements.	DOH, SDWB	As discussed in *Section 3.10 Utilities,* BWS will continue to supply water to the transfer station. If additional water is needed, KTS will be required to pay the BWS Water System Facilities Charges for resource development, transmission and daily storage. The proposed Project is subject to BWS Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit applications.
All projects which propose the establishment of a potentially contaminating activity (as identified in the Hawai'i Source Water Assessment Plan) within the source water protection area of an existing source of water for a public water supply should address this potential and activities that will be	DOH, SDWB	A potential contaminating activity is defined as a facility or activity that: 1) stores, transmits, uses, or produces contaminants, chemicals or by-products; and 2) has the potential to release contaminants that may impact quality of the source water. While KTS may have potential contaminating activity with the storage of waste

Table 7.2 DEA Summary of Comments and Responses		
Comments	**Commenter**	**Responses**
implemented to prevent or reduce the potential for contamination of the drinking water source.		materials, it is not located within a source water protection area of an existing source of water for a public water supply. No mitigation to reduce the potential for contamination of the drinking water source is provided.
The parcel has an existing water service. If additional water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission, and daily storage.	BWS	ENV acknowledges this comment as discussed in *Section 3.10, Utilities.*
Water conservation measures are required for the proposed developments. These measures include utilization of nonpotable water for irrigation using rain catchment, drought tolerant plants, xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets.	BWS	Water conservation measures are currently discussed in *Section 3.10 Utilities* and additional measures will be considered as practical.
The proposed project is subject to Board of Water Supply Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.	BWS	ENV acknowledges this comment as discussed in *Section 3.10, Utilities.*
The construction drawings should be submitted for our review. The construction schedule should be coordinated to minimize impact to the water system.	BWS	ENV acknowledges this comment as discussed in *Section 3.10, Utilities.*
Public Safety		
The Honolulu Police Department has reviewed the plans and does not have any comments or concerns at this time.	HPD	ENV acknowledges this comment.

Early Consultation Letters and Responses

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
01EPIF00-2020-TA-0454

August 28, 2020

Ms. Barbara Natale, AICP
G70
111 S. King Street, Suite 170
Honolulu, HI 96813

Subject: Technical Assistance for the Kawailoa Transfer Station Preparation of a Draft Environmental Assessment, Haleiwa, Oahu

Dear Ms. Natale:

Thank you for your recent correspondence requesting technical assistance on species biology, habitat, or life requisite requirements. The Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (Service) appreciates your efforts to avoid or minimize effects to protected species associated with your proposed actions. We provide the following information for your consideration under the authorities of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 *et seq*.), as amended.

Due to significant workload constraints, PIFWO is currently unable to specifically address your information request. The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. Based on your project location and description, we have noted the species most likely to occur within the vicinity of the project area, in the '**Occurs In or Near Project Area'** column. Please note this list is not comprehensive and should only be used for general guidance. We have added to the PIFWO website, located at https://www.fws.gov/pacificislands/promo.cfm?id=177175840 recommended conservation measures intended to avoid or minimize adverse effects to these federally protected species and best management practices to minimize and avoid sedimentation and erosion impacts to water quality.

If you are representing a federal action agency, please use the official species list on our web-site for your section 7 consultation. You can find out if your project occurs in or near designated critical habitat here: https://ecos.fws.gov/ipac/.

Under section 7 of the ESA, it is the Federal agency's (or their non-Federal designee) responsibility to make the determination of whether or not the proposed project "may affect"

federally listed species or designated critical habitat. A "may affect, not likely to adversely affect" determination is appropriate when effects to federally listed species are expected to be discountable (*i.e.*, unlikely to occur), insignificant (minimal in size), or completely beneficial. This conclusion requires written concurrence from the Service. If a "may affect, likely to adversely affect" determination is made, then the Federal agency must initiate formal consultation with the Service. Projects that are determined to have "no effect" on federally listed species and/or critical habitat do not require additional coordination or consultation.

Implementing the avoidance, minimization, or conservation measures for the species that may occur in your project area will normally enable you to make a "may affect, not likely to adversely affect" determination for your project. If it is determined that the proposed project may affect federally listed species, we recommend you contact our office early in the planning process so that we may assist you with the ESA compliance. If the proposed project is funded, authorized, or permitted by a Federal agency, then that agency should consult with us pursuant to section 7(a)(2) of the ESA. If no Federal agency is involved with the proposed project, the applicant should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. A section 10 permit application must include a habitat conservation plan that identifies the effects of the action on listed species and their habitats, and defines measures to minimize and mitigate those adverse effects.

We appreciate your efforts to conserve endangered species. We regret that we cannot provide you with more specific protected species information for your project site. If you have questions that are not answered by the information on our website, you can contact PIFWO at (808) 792-9400 and ask to speak to the lead biologist for the island where your project is located.

Sincerely,

Acting Island Team Manager
Pacific Islands Fish and Wildlife Office

The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. For your guidance, we‘ve marked species that may occur in the vicinity of your project, this list is not comprehensive and should only be used for general guidance.

Scientific Name	**Common Name / Hawaiian Name**	**Federal Status**	**May Occur In Project Area**
Mammals			
Lasiurus cinereus semotus	Hawaiian hoary bat/ ‘ōpe‘ape‘a	E	☒
Reptiles			
Chelonia mydas	Green sea turtle/honu - Central North Pacific DPS	T	☐
Erectmochelys imbricata	Hawksbill sea turtle/ Honu ‘ea	E	☐
Birds			
Anas wyvilliana	Hawaiian duck/ koloa	E	☐
Branta sandvicensis	Hawaiian goose/ nēnē	T	☐
Fulica alai	Hawaiian coot/ ‘alae kea	E	☐
Gallinula chloropus sandvicensis	Hawaiian gallinule/ ‘alae ‘ula	E	☐
Himantopus mexicanus knudseni	Hawaiian stilt/ Ae‘o	E	☐
Oceanodroma castro	Band-rumped storm-petrel/ ‘akē‘akē	E	☒
Pterodroma sandwichensis	Hawaiian petrel/ ‘ua‘u	E	☒
Puffinus auricularis newelli	Newell’s shearwater/ ‘a‘o	T	☒
Ardenna pacificus	Wedge-tailed Shearwater/ ‘ua‘u kani	MBTA	☐
Gygis alba	White Tern/ manu-o-kū	MBTA	☐
Buteo solitarius	Hawaiian hawk/ ‘io	E	☐
Insects			
Manduca blackburni	Blackburn’s sphinx moth	E	☐
Megalagrion pacificum	Pacific Hawaiian Damselfly	E	☐
M. xanthomelas	Orangeblack Hawaiian Damselfly	E	☐
M. nigrohamatum nigrolineatum	Blackline Hawaiian Damselfly	E	☐

Plants				
Scientific Name	**Common Name or Hawaiian Name**	**Federal Status**	**Locations**	**May Occur In Project Area**
Abutilon menziesii	Koʻoloaʻula	E	O, L, M, H	☐
Achyranthes splendens var. *rotundata*	ʻEwa hinahina	E	O	☐
Bonamia menziesii	No common name	E	K, O, L, M, H	☐
Canavalia pubescens	ʻĀwikiwiki	E	Ni, K, L, M	☐
Colubrina oppositifolia	Kauila	E	O, M, H	☐
Cyperus trachysanthos	Puʻukaʻa	E	K, O	☐
Gouania hillebrandii	No common name	E	Mo, M	☐
Hibiscus brackenridgei	Maʻo hau hele	E	O, Mo, L, M, H	☐
Ischaemum byrone	Hilo ischaemum	E	K, O, Mo, M, H	☐
Isodendrion pyrifolium	Wahine noho kula	E	O, H	☐
Marsilea villosa	ʻIhiʻihi	E	Ni, O, Mo	☐
Mezoneuron kavaiense	Uhiuhi	E	O, H	☐
Nothocestrum breviflorum	ʻAiea	E	H	☐
Panicum fauriei var. *carteri*	Carter's panicgrass	E	Molokini Islet (O), Mo	☐
Panicum niihauense	Lauʻehu	E	K	☐
Peucedanum sandwicense	Makou	E	K, O, Mo, M	☐
Pleomele (Chrysodracon) hawaiiensis	Halapepe	E	H	☐
Portulaca sclerocarpa	ʻIhi	E	L, H	☐
Portulaca villosa	ʻIhi	E	Le, Ka, Ni, O, Mo, M, L, H, Nihoa	☐
Pritchardia affinis (maideniana)	Loulu	E	H	☐
Pseudognaphalium sandwicensium var. *molokaiense*	ʻEnaʻena	E	Mo, M	☐
Scaevola coriacea	Dwarf naupaka	E	Mo, M	☐
Schenkia (*Centaurium*) *sebaeoides*	ʻĀwiwi	E	K, O, Mo, L, M	☐
Sesbania tomentosa	ʻŌhai	E	Ni, Ka, K, O, Mo, M, L, H, Necker, Nihoa	☐
Tetramolopium rockii	No common name	T	Mo	☐
Vigna o-wahuensis	No common name	E	Mo, M, L, H, Ka	☐

Location key: O=Oʻahu, K=Kauaʻi, M=Maui, H=Hawaiʻi Island, L=Lānaʻi, Mo=Molokaʻi, Ka=Kahoʻolawe, Ni=Niʻihau, Le=Lehua

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

January 13, 2021

Ms. Jiny Kim
Acting Island Team Manager
U.S. Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, HI 96850

Subject: 01EPIF00-2020-TA-0454
Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
O‘ahu, Waialua District, Kawailoa Ahupua‘a
TMK: (1) 6-1-005:018 (por.)

Dear Ms. Kim,

Thank you for your comment letter dated August 28, 2020 concerning the Early Consultation for Draft Environmental Assessment (EA) for the proposed Kawailoa Transfer Station Green Waste Recycling Improvements project, located at 62-180 Kawailoa Drive, Hale‘iwa, Hawai‘i 96712.

Thank you for providing us with a list of protected species that are most likely to be encountered based on the location of the project. The proposed improvements will seek to avoid affecting any federally listed endangered species. The Draft EA will assess conservation measures intended to avoid and minimize adverse effects to these federally listed endangered species that may occur in the project area. Best management practices will be included which minimize and avoid sedimentation and erosion impacts to water quality.

We anticipate a determination by the Federal agency that the proposed project “may affect, not likely to adversely affect” federally listed species or designated critical habitat, and we will contact your office should we find that the proposed project would affect either.

We appreciate your input and participation in this review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC., dba G70

Jeffrey H. Overton, AICP, LEED AP
Principal

cc: Josh Nagashima, ENV

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

RECEIVED
OCT 01 2020
G70

September 25, 2020

G70
111 South King Street, Suite 170
Honolulu, HI 96813
Attn: Barbara Natale, AICP

Log no. 2770

Dear Ms. Natale:

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your inquiry regarding the Early Consultation for the Draft Environmental Assessment of the Kawailoa Transfer Station green water recycling improvements in Pūpūkea on O'ahu, Hawai'i, TMK: (1) 6-1-005:018. The proposed project involves expanding the existing Kawailoa Transfer Station and consists of vegetation clearing, minor grading and excavation, paving and general construction to accomodate 28,000 square feet of collection, transfer, parking and circulation, storage and operational space.

The State listed Hawaiian Hoary Bat or 'Ōpe'ape'a (*Lasiurus cinereus semotus*) has the potential to occur in the vicinity of the project area and may roost in nearby trees. If any site clearing is required this should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW.

DOFAW recommends minimizing the movement of plant or soil material between worksites, such as in fill. Soil and plant material may contain invasive fungal pathogens (e.g. Rapid 'Ōhi'a Death), vertebrate and invertebrate pests (e.g. Little Fire Ants, Coconut Rhinoceros Beetles), or invasive plant parts that could harm our native species and ecosystems. We recommend consulting the O'ahu Invasive Species Committee at (808) 266-7994 in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.

State listed waterbirds such as the Hawaiian Duck (*Anas wyvilliana*), Hawaiian Stilt (*Himantopus mexicanus knudseni*), Hawaiian Coot (*Fulica alai*), and Hawaiian Common Gallinule (*Gallinula chloropus sandvicensis*) have the potential to occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the

area of its own accord. If a nest is discovered at any point, please contact the O'ahu DOFAW Office at (808) 973-9778.

DOFAW is concerned about attracting vulnerable birds to areas that may host nonnative predators such as cats, rodents, and mongoose. Additionally, improvements to the facility are likely to increase human and operational activity and may generate more predator attractants. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.

We note that artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade artifacts or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea. For illustrations and guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawai'i please visit: https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Lauren Taylor, Protected Species Habitat Conservation Planning Coordinator at (808) 587-0010 or lauren.tavlor@hawaii.gov.

Sincerely,

DAVID G. SMITH
Administrator

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

January 13, 2021

Mr. David G. Smith
Administrator
State of Hawai‘i
Department of Land and Natural Resources
Department of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, HI 96813

Subject: Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
O‘ahu, Waialua District, Kawailoa Ahupua‘a
TMK: (1) 6-1-005:018 (por.)

Dear Mr. Smith,

Thank you for your comment letter dated September 25, 2020 concerning the Early Consultation for Draft Environmental Assessment (EA) for the proposed Kawailoa Transfer Station Green Waste Recycling Improvements project, located at 62-180 Kawailoa Drive, Hale‘iwa, Hawai‘i 96712.

The following is in response to your comments.

The Draft EA will include a discussion of the potential impacts and mitigation measures for the Hawaiian Hoary Bat, state listed waterbirds, and seabirds that may be potentially impacted with the proposed improvements.

We understand DOFAW recommends minimizing the movement of plant and soil materials between worksites. The Draft EA will address potential impacts and mitigation measures involving the clearing of vegetation and landscaping activity with the proposed improvements.

A copy of the Draft EA will be provided to your office. Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC., dba G70

Jeffrey H. Overton, AICP, LEED AP
Principal

cc: Josh Nagashima, ENV

DAVID Y. IGE
GOVERNOR OF HAWAII

BRUCE S. ANDERSON, Ph.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
File:

September 2, 2020 S0903LI

Ms. Barbara Natale, AICP
Group 70 International, Inc.
111 South King Street, Suite 170
Honolulu, Hawaii 96813
Via Email Only: KawailoaTS@g70.design

Dear Ms. Natale:

SUBJECT: Early Consultation Request for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
62-180 Kawailoa Drive, Haleiwa, Hawaii 96712
TMK: (1) 6-1-005:018

The Department of Health, Solid and Hazardous Waste Branch received your letter dated August 20, 2020. Your letter requested comments on the proposed expansion project.

Based on your August 20, 2020 letter, we understand that the proposed project will involve the construction and operation of a second load-out area, permanent office structure and restroom. The proposed expansion of your solid waste activity will require a modification to your existing solid waste management permit, in accordance with Chapter 11-58.1, Hawaii Administrative Rules. We will be asking the applicant to address our regulatory requirements and our specific concerns during the solid waste permitting process.

However, as you prepare your Draft Environmental Assessment and your preliminary designs for the facility, please pay extra consideration to your environmental controls for the specific materials and collection activity to address potential leachate generation and management; surface water runoff; fire; and litter, dust, odor, and vector. In addition, we note that the old landfill and existing stormwater drainage and culvert appears to be relatively close to the limits of the proposed expansion. As with many old landfills, the estimated limit of waste may not be exactly as described in former documents and field verification in the area of the construction may be warranted and accounted for in the design. Please consider design, construction, and operational impacts on not just the proposed expansion (e.g., settlement, gas migration) but also on the old landfill (e.g. surface water management).

In addition, our standard comments may be found at:
https://health.hawaii.gov/epo/files/2018/11/SHWB-standard-comments-v3-Nov-2018-update.pdf.

If you have any questions regarding this letter, please contact me at (808) 586-4226.

Sincerely,

Lene Ichinotsubo

LENE ICHINOTSUBO, P.E., ACTING CHIEF
Solid and Hazardous Waste Branch

c: Mr. Josh Nagashima, Planner, ENV/Refuse Division (via email only)

Solid and Hazardous Waste Branch
Standard Comments

November 26, 2018

The Solid and Hazardous Waste Branch administers programs in the areas of:

1) Management of hazardous waste;
2) Management of solid waste; and
3) Regulation of underground storage tanks.

Our general comments on projects are below. For further information about these programs, please contact the Solid and Hazardous Waste Branch at (808) 586-4226. All chapters of the Hawaii Revised Statutes (HRS) are at https://www.capitol.hawaii.gov/hrscurrent/.

Hazardous Waste Program

- The state regulations for hazardous waste and used oil are in chapters 11-260.1 to 11-279.1, Hawaii Administrative Rules (HAR) [http://health.hawaii.gov/shwb/hwrules/]. These rules apply to the identification, handling, transportation, storage and disposal of regulated hazardous waste and used oil. Generators, transporters and treatment, storage, and disposal facilities of hazardous waste and used oil must adhere to these requirements. Violations are subject to penalties under chapter 342J, HRS.

Solid Waste Section

- The Solid Waste Section (SWS) enforces laws and regulations contained in chapters 342H and 342I, HRS, and chapter 11-58.1, HAR, "Solid Waste Management Control" [http://health.hawaii.gov/shwb/solid-waste/].

- The purpose of the rules is to establish minimum standards governing the design, construction, installation, operation, and maintenance of solid waste disposal, recycling, reclamation and transfer systems.

- All facilities that accept solid wastes are required to obtain a solid waste management permit from the SWS. Examples of the types of facilities governed by these regulations include landfills, transfer stations and convenience centers, recycling facilities, composting facilities, and salvage facilities. Medical waste, infectious waste, and foreign waste treatment facilities are also included.

- Generators of solid waste are required to ensure that their wastes are properly delivered to permitted solid waste management facilities. Managers of construction and demolition projects should require their waste contractors to submit disposal receipts and invoices to ensure proper disposal of wastes.

Solid and Hazardous Waste Branch Standard Comments

Office of Solid Waste Management

- The Office of Solid Waste Management (OSWM) administers statewide integrated solid waste management planning activities, which apply to the counties, as well as various recycling programs, e.g. the Glass Advance Disposal Fee (ADF) and Deposit Beverage Container (DBC) Programs. Management of the DBC Program is conducted pursuant to chapter 342G, HRS, which contains compliance and enforcement provisions, and chapter 11-282, HAR, "Deposit Beverage Recycling" [http://health.hawaii.gov/hi5/rules-regulations-additional-links/]. OSWM is also responsible for limited enforcement and compliance of solid waste management facilities that operate primarily as certified DBC redemption centers pursuant to chapter 342H, HRS, and chapter 11-58.1, HAR, "Solid Waste Management Control" [http://health.hawaii.gov/shwb/solid-waste/]. Authority for the integrated solid waste management planning and ADF programs is contained in chapter 342G, HRS.

- Glass Advance Disposal Fee Program: Businesses that import glass containers into Hawaii are required to register with the Department of Health and pay a 1.5 cent per container fee. Fee revenue is distributed to the counties for the operation of glass recycling programs.

- Deposit Beverage Container Program: Business that manufacture or import deposit beverage containers into Hawaii are required to register with the Department of Health and pay the five cent deposit and one cent container fee on each deposit container. Deposits and fees are deposited into a special fund and are used to reimburse DBC redemption center refunds paid to consumers; and to pay handling fees to redemption/recycling companies to process and recycle collected deposit beverage containers; and to pay program administrative costs.

- The Department of Health reimburses and pays an associated handling fee for the redemption of deposit beverage containers (DBC). These transactions are conducted only with certified redemption centers. Certification requires obtaining a solid waste management permit from the SWS (which addresses environmental issues) and a certification from the DBC program (which standardizes the redemption process).

- Chapter 342G, HRS, encourages the reduction of waste generation, reuse of discarded materials, and the recycling of solid waste. Businesses, property managers and developers, and government entities are highly encouraged to develop solid waste management plans to ensure proper handling of wastes and divert recyclables from being landfilled.

- Solid waste management plans seek to maximize waste diversion and minimize disposal. Such plans should include designated areas to promote the collection of reusable and recyclable materials.

Solid and Hazardous Waste Branch Standard Comments

Underground Storage Tank Program

- The state's underground storage tank (UST) regulations, found in chapter 11-280.1, HAR [http://health.hawaii.gov/shwb/underground-storage-tanks/], include specific requirements that UST owners and operators must meet when installing, operating, and permanently closing their UST systems and addressing releases from USTs. Violations are subject to penalties under chapter 11-280.1, HAR, and chapter 342L, HRS.

- A permit is required prior to the installation and operation of a UST. Any new UST system that will be installed must have secondary containment with interstitial monitoring. Refer to subchapters 2, 3, 4, and 12 of chapter 11-280.1, HAR. The installation permit expires 1 year from the date of issuance. The operation permit expires 5 years from the date of issuance.

- §11-280.1-50, HAR, requires owners and operators of USTs or tank systems to notify DOH within twenty-four (24) hours and follow the procedures in §11-280.1-52, HAR, if any of the following occur, with specific exceptions found in the rules:
  1) The discovery by any person of evidence of regulated substances which may have been released at the UST site or in the surrounding area (such as the presence of free product or vapors in soils, basements, sewer and utility lines, or nearby surface water);
  2) Unusual UST system operating conditions observed or experienced (such as the erratic behavior of product dispensing equipment, the sudden loss of product from the UST, or an unexplained presence of water in the tank); or
  3) Monitoring results from a release detection method required under §§11-280.1-41 or 11-280.1-42 indicate a release may have occurred.

- For release response actions, responsible parties and their consultants and contractors should follow the applicable guidance in the Department of Health Hazard Evaluation Emergency (HEER) Office Technical Guidance Manual, HEER Environmental Action Level (EAL) guidance, and other guidance documents on the DOH HEER Office website [http://eha-web.doh.hawaii.gov/eha-cma/Org/HEER/], including those pertaining to Multi-Increment Sampling of soil, low flow groundwater sampling, soil vapor sampling, and Environmental Hazard Evaluations (EHE)/Environmental Hazard Management Plans (EHMP).

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

January 13, 2021

Ms. Lene Ichinotsubo, P.E.
Acting Chief
Solid and Hazardous Waste Branch
State of Hawai‘i, Department of Health
P.O. Box 3378
Honolulu, HI 96801-3378

Subject: Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
O‘ahu, Waialua District, Kawailoa Ahupua‘a
TMK: (1) 6-1-005:018 (por.)

Dear Ms. Ichinotsubo,

Thank you for your comment letter dated September 2, 2020 concerning the Early Consultation for Draft Environmental Assessment (EA) for the proposed Kawailoa Transfer Station Green Waste Recycling Improvements project, located at 62-180 Kawailoa Drive, Hale‘iwa, Hawai‘i 96712.

We understand the proposed improvements will require a modification to the existing solid waste management permit. The Draft EA will acknowledge the regulatory requirements of the solid waste permitting process.

In addition, the Draft EA will address environmental controls for the specific materials and collection activity on the property. Consideration will be given in the design of the proposed improvements to allow for management of potential leachate generation and surface water runoff. Fire, litter, dust, odor and vectors are addressed in the facility’s Site Operations Manual/Plan and the improvements will be incorporated into the plan. The Draft EA will consider design, construction, and operational impacts on not just the proposed expansion but also on the old landfill.

The Draft EA will acknowledge the State regulations associated with the improvements to the transfer station, as mentioned in the standard comments.

We appreciate your input and participation in this review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC., dba G70

Jeffrey H. Overton, AICP, LEED AP
Principal

cc: Josh Nagashima, ENV

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

Deputy Director
LYNN A.S. ARAKI-REGAN
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

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

IN REPLY REFER TO:
DIR 0796
HWY-PS 2.4059

September 23, 2020

Ms. Barbara Natale
Group 70 International, Inc.
111 South King Street, Suite 170
Honolulu, Hawaii 96813

Dear Ms. Natale:

Subject: Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Expansion
Pupukea, Oahu, Hawaii
Tax Map Key No.: (1) 6-1-5: 018

Thank you for your letter dated August 20, 2020, requesting an early consultation on the preparation of a Draft Environmental Assessment (DEA) required by Chapter 343, Hawaii Revised Statutes on the subject project due to the use of City lands and City funds.

The proposed work includes the expansion of an existing refuse and green waste recycling station. The project improvements will provide additional office building, restroom, storage and collection area totaling 28,000 square feet to the property. The project involves the construction of an office structure and various improvements that will also require excavating, grading, and clearing of vegetation at the site. The station will be supported by daily operations including the receiving and transferring of County refuse and green waste. This particular station will also be opened to the general public as a drop off convenience center for refuse and recycling.

The site's primary access is off State Kamehameha Highway (Route 83) via Kawailoa Drive; a County roadway.

The Hawaii Department of Transportation has the following comments:

1. A discussion in the DEA and/or a Traffic Assessment prepared by a Professional Engineer with State license and traffic expertise, should be included to address the following concerns:

    a. An analysis should be provided to identify trip generated impacts by possible expansion or new operational uses from the project site onto the nearest State Kamehameha Highway. Also, provide any mitigation measures that may be required.

b. A permit is required from the Highways Division to transport oversized/overweight equipment/loads within our State highways facilities.

If you have any questions, please contact Jeyan Thirugnanam, Systems Planning Engineer, Highways Division, Planning Branch at (808) 587-6336 or by email at jeyan.thirugnanam@hawaii.gov. Please reference file review number PS 2020-130.

Sincerely,

JADE T. BUTAY
Director of Transportation

c: Josh Nagashima (City and County of Honolulu)

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

January 13, 2021

Mr. Jade T. Butay
Director of Transportation
State of Hawai‘i
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

Subject: Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
O‘ahu, Waialua District, Kawailoa Ahupua‘a
TMK: (1) 6-1-005:018 (por.)

Dear Mr. Butay,

Thank you for your comment letter dated September 23, 2020 concerning the Early Consultation for Draft Environmental Assessment (EA) for the proposed Kawailoa Transfer Station Green Waste Recycling Improvements project, located at 62-180 Kawailoa Drive, Hale‘iwa, Hawai‘i 96712.

The following is in response to your comments.

A Traffic Assessment prepared by a Professional Engineer will be included as part of the Draft EA to assess the potential trip generated impacts and mitigation measures due to the proposed improvements. The discussion will include the need for a permit from the Highways Division to transport oversized/overweight equipment/loads within State highway facilities.

A copy of the Draft EA will be provided to your office. Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC., dba G70

Jeffrey H. Overton, AICP, LEED AP
Principal

cc: Josh Nagashima, ENV

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

MARY ALICE EVANS
DIRECTOR
OFFICE OF PLANNING

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

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

DTS 202009092246HE

September 14, 2020

Ms. Barbara Natale, AICP
Project Manager
G70
111 South King Street, Suite 170
Honolulu, HI 96813

Dear Ms. Natale:

Subject: Early Consultation Draft Environmental Assessment for the Proposed Kawailoa Transfer Station Green Waste Recycling Improvements
Oahu, Koolau Loa District, Pupukea Ahupuaa
TMK: (1) 6-1-005: 018

Thank you for the opportunity to provide comments for the Early Consultation Request of a Draft Environmental Assessment (Draft EA) for the proposed Kawailoa Transfer Station Green Waste Recycling Improvements and Expansion project, located in Haleiwa, Oahu. The review material was transmitted to our office via letter dated August 20, 2020.

It is our understanding that the project involves the expansion of the Kawailoa Transfer Station to handle the collection and storage of green waste for recycling. The enhancements, proposed by the City and County of Honolulu, Department of Environmental Services (ENV), is expected to include building a second load-out, permanent offices, and restrooms.

Site improvements will be limited to the developed portion of the site and will include 28,000 square feet of collection, transfer, parking and circulation, storage, and operational spaces. Development of the site will involve minor grading, grubbing, and excavation, paving, and general construction. Upon completion of the expanded facility, green waste will be received and transferred separately at the improved transfer station.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. <u>The Hawaii State Planning Act</u>
   The Hawaii Revised Statutes (HRS) Chapter 226, serves as a guide for long-term development for the State. It provides 1) goals, objectives, and policies; 2) the allocation of resources through planning coordination and implementation efforts; and 3) priority

guidelines for the State. The Draft EA should include a discussion on the provisions of Hawaii Revised Statutes (HRS) Chapter 226, as they pertain to the expansion of the Kawailoa Transfer Station.

2. Hawaii Coastal Zone Management (CZM) Program
The CZM area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" (HRS § 205A-1).

   In implementing the objectives and supporting policies of the Hawaii CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As this project is being proposed by ENV, a government agency, the Draft EA should include analysis on the project's consistency with the objectives and supporting policies of the Hawaii CZM Program, HRS § 205A-2, as amended. Compliance with HRS § 205A-2 is an important component for satisfying the requirements of HRS Chapter 343.

3. Special Management Area (SMA)
The subject Environmental Assessment (EA) will serve as the primary supporting document for any SMA Use Permit application. The EA, therefore, should specifically discuss compliance with the requirements of Revised Ordinances of Honolulu Chapter 25, SMA, for the proposed project by consulting with the Department of Planning and Permitting, City and County of Honolulu.

4. Climate Change / Sea Level Rise (SLR)
Sea level rise increases the risk of flooding, storm surges, and coastal erosion. To assess any potential impacts of sea level rise on the proposed residential development area, OP suggests the Draft EA refer to the findings of the Hawaii Sea Level Rise Vulnerability and Adaptation Report 2017, accepted by the Hawaii Climate Change Mitigation and Adaptation Commission. The Report, and the Hawaii Sea Level Rise Viewer (which can be accessed at https://www.pacioos.hawaii.edu/shoreline/slr-hawaii/), identifies a 3.2-foot sea level rise exposure area across the main Hawaiian Islands, including Oahu, which may occur in the mid to latter half of the 21st century. The Draft EA should provide a map of 3.2-foot sea level rise exposure area in relation to the property area and consider site-specific mitigation measures to respond to the potential impacts of sea level rise on the proposed development.

5. Stormwater Runoff, Erosion, and Water Resources
Pursuant to Hawaii Administrative Rules (HAR) § 11-200.1-18(d)(7) – identification and analysis of impacts and alternatives considered; to ensure that nearshore marine resources

along the Leeward coastal area of Oahu remain protected, the negative effects of stormwater inundation and sediment loading surrounding the proposed project site should be evaluated.

Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, potential vulnerability of water resources, the shoreline, and examining any increase of permeable surfaces in the area. Developing mitigation measures for the protection for surface water resources and the coastal ecosystem should take this into account, pursuant to HAR § 11-200.1-18(d)(8).

To assist in the development of stormwater runoff strategies, OP has developed guidance documents on this subject. We recommend consulting these stormwater evaluative tools when developing mitigation approaches for polluted runoff. They offer useful techniques to keep land-based pollutants and sediment in place, while considering the management practices best suited for the topography of the area and the types of contaminants potentially affecting nearby water resources. The evaluative tools can be used during the design process of stormwater mitigation strategies include:

- Stormwater Impact Assessments can be used to identify and analyze information on hydrology, sensitivity of coastal and riparian resources, and management measures to control runoff, as well as consider secondary and cumulative impacts to the area. http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_stormwater_impact_assessments_guidance.pdf.; and

- Low Impact Development (LID), A Practitioners Guide covers a range of structural BMPs for stormwater control management, onsite infiltration techniques, and water reuse methods that minimize negative environmental impacts. http://files.hawaii.gov/dbedt/op/czm/initiative/lid/lid_guide_2006.pdf

If you have any questions regarding this comment letter, please contact Joshua Hekekia of our office at (808) 587-2845.

Sincerely,

Mary Alice Evans

Mary Alice Evans
Director

c: Josh Nagashima, City and County of Honolulu, Department of Environmental Services, Refuse Division

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

January 13, 2021

Ms. Mary Alice Evans
Director
State of Hawai‘i
Office of Planning
P.O. Box 2359
Honolulu, HI 96804

Subject: Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
O‘ahu, Waialua District, Kawailoa Ahupua‘a
TMK: (1) 6-1-005:018 (por.)

Dear Ms. Evans,

Thank you for your comment letter dated September 14, 2020 concerning the Early Consultation for Draft Environmental Assessment (EA) for the proposed Kawailoa Transfer Station Green Waste Recycling Improvements project, located at 62-180 Kawailoa Drive, Hale‘iwa, Hawai‘i 96712.

The following is in response to your comments.

The Draft EA for the proposed improvements will be prepared in accordance with the applicable State and County plans and policies including goals, policies, and objectives stated in the Hawai‘i Revised Statutes (HRS), Chapter 226; the objectives and policies of the Hawai‘i CZM Program and HRS Chapter 205A-2, as amended; and the Revised Ordinances of Honolulu, Chapter 25 Special Management Area.

A 3.2-foot sea level rise exposure map will be prepared in relation to the project site to assess the potential impacts of sea level rise.

The Draft EA will identify and analyze alternatives for the proposed project. Additionally, the Draft EA will evaluate stormwater runoff and sediment loading with the proposed improvements. Pursuant to HAR Chapter 11-200.1-18(d)(8), mitigation measures to protect the North Shore coastal area downstream and surface water resources from stormwater runoff will be discussed in the Draft EA.

We appreciate your input and participation in this review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC., dba G70

Jeffrey H. Overton, AICP, LEED AP
Principal

cc: Josh Nagashima, ENV

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

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ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

September 17, 2020

RECEIVED
18 2020
G70

Ms. Barbara Natale
Group 70 International, Inc.
111 South King Street, Suite 170
Honolulu, Hawaii 96813

Dear Ms. Natale:

Subject: Your Letter Dated August 20, 2020 Requesting Comments on the Early Consultation for Draft Environmental Assessment for Kawailoa Transfer Station Green Waste Recycling Improvements off Kawailoa Drive, Tax Map Key: 6-1-005: 018

Thank you for the opportunity to comment on the proposed transfer station improvements project.

The existing water system cannot provide adequate off-site fire protection to the proposed green waste facility improvement project. The nearest fire hydrant, Fire Hydrant No. C-00056, is located on Kamehameha Highway, which is more than 1,840 linear feet from the project site. The water system improvements are extensive.

The parcel has an existing water service. If additional water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission, and daily storage.

The proposed project is subject to BWS Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.

The construction drawings should be submitted for our review. The construction schedule should be coordinated to minimize impact to the water system.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

cc: Josh Nagashima, Department of Environmental Services

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

January 13, 2021

Mr. Ernest Y. W. Lau, P.E.
Manager and Chief Engineer
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, HI 96843

Subject: Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
O‘ahu, Waialua District, Kawailoa Ahupua‘a
TMK: (1) 6-1-005:018 (por.)

Dear Mr. Lau,

Thank you for your comment letter dated September 17, 2020 concerning the Early Consultation for Draft Environmental Assessment (EA) for the proposed Kawailoa Transfer Station Green Waste Recycling Improvements project, located at 62-180 Kawailoa Drive, Hale‘iwa, Hawai‘i 96712.

We understand the existing water system cannot provide off-site fire protection to the project site with the proposed improvements. The water system improvements will be addressed in the Draft EA. We also understand if additional water is made available, the City will be required to pay the Water System Facilities Charges. Additionally, we understand the proposed improvements are subject to the review of the Cross Connection Control Section prior to the issuance of a building permit.

Construction drawings will be submitted for your review and construction schedule coordinated to minimize impact to the water system. On-site fire protection requirements will be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

A copy of the Draft EA will be provided to your office. Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC., dba G70

Jeffrey H. Overton, AICP, LEED AP
Principal

cc: Josh Nagashima, ENV

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

MARK YONAMINE, P.E.
DIRECTOR

HAKU MILLES, P.E.
DEPUTY DIRECTOR

September 3, 2020

SENT VIA EMAIL

KawailoaTS@g70.design
G70

Attn: Barbara Natale, AICP

Dear Ms. Natale,

Subject: Early Consultation for Draft Environmental Assessment (DEA) Kawailoa Transfer Station Green Waste Recycling Improvements, Oahu, Koolau Loa District, Pupukea Ahupuaa TMK: 6-1-05:18

Thank you for the opportunity to review and comment. The Department of Design and Construction has no comments to offer at this time.

Should you have any further questions, please contact me at 768-8480.

Sincerely,

FOR Mark Yonamine, P.E.
Director

MY:cf

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

January 13, 2021

Mr. Mark Yonamine, P.E.
Director
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, HI 96813

Subject: Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
O‘ahu, Waialua District, Kawailoa Ahupua‘a
TMK: (1) 6-1-005:018 (por.)

Dear Mr. Yonamine,

Thank you for your comment letter dated September 3, 2020 concerning the Early Consultation for Draft Environmental Assessment (EA) for the proposed Kawailoa Transfer Station Green Waste Recycling Improvements project, located at 62-180 Kawailoa Drive, Hale‘iwa, Hawai‘i 96712.

We acknowledge that the Department of Design and Construction has no comments to offer at this time.

A copy of the Draft EA will be provided to your office. Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC., dba G70

Jeffrey H. Overton, AICP, LEED AP
Principal

cc: Josh Nagashima, ENV

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Ulu`ohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROSS S. SASAMURA, P.E.
DIRECTOR AND CHIEF ENGINEER

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 20-455

September 4, 2020

RECEIVED
SEP 08 2020
G70

Ms. Barbara Natale, AICP
G70
111 S. King Street, Suite 170
Honolulu, Hawaii 96813

Dear Ms. Natale:

Subject: Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
TMK: 6-1-05:18

Thank you for the opportunity to review and comment on the subject project.

Our comments are as follows:

- During construction and upon completion of the project, any damages/deficiencies along the roadways on Kawailoa Drive shall be repaired to City Standards and accepted by the City and at no cost to the City and County of Honolulu.

- Please note that there is a roadway easement that is located fronting the property and four drainage inlet/outlets located within the property.

If you have any questions, please call Mr. Kyle Oyasato of the Division of Road Maintenance at 768-3697.

Sincerely,

Ross S. Sasamura, P.E.
Director and Chief Engineer

cc: Department of Environmental Services, Refuse Division - Josh Nagashima

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

January 13, 2021

Mr. Ross S. Sasamura, P.E.
Director and Chief Engineer
City and County of Honolulu
Department of Facility Maintenance
1000 Ulu‘ohia Street, Suite 215
Kapolei, HI 96707

Subject: Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
O‘ahu, Waialua District, Kawailoa Ahupua‘a
TMK: (1) 6-1-005:018 (por.)

Dear Mr. Sasamura,

Thank you for your comment letter dated September 4, 2020 concerning the Early Consultation for Draft Environmental Assessment (EA) for the proposed Kawailoa Transfer Station Green Waste Recycling Improvements project, located at 62-180 Kawailoa Drive, Hale‘iwa, Hawai‘i 96712.

We understand the applicant is responsible for any damages to Kawailoa Drive caused by the proposed improvements. We also understand the front of the property along with four drainage inlet/outlets are under a roadway easement that is fronting the property. Although the proposed improvements will not adversely affect the areas under the easement, the Draft EA will include mitigation measures to avoid adverse effects to the four drainage inlet/outlets located on the property.

A copy of the Draft EA will be provided to your office. Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC., dba G70

Jeffrey H. Overton, AICP, LEED AP
Principal

cc: Josh Nagashima, ENV

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
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KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

RECEIVED
SEP 11 2020
G70

September 9, 2020

2020/ELOG-1633(LP)

Ms. Barbara Natale, AICP
G70
111 South King Street, Suite 170
Honolulu, Hawaii 96813

Dear Ms. Natale:

SUBJECT: Kawailoa Transfer Station Green Waste Recycling Improvements
62-180 Kawailoa Drive - Haleiwa
Tax Map Key 6-1-005: 018

This is in response to your letter, received on August 24 2020, requesting for early consultation for a Draft Environmental Assessment (DEA) for the subject site. The site is a 28.32 acre lot in the AG-1 Restricted Agricultural District and the State Land Use Agricultural District. The majority of the site in the Special Management Area (SMA) and in Flood Zone D - which constitutes areas of undetermined flood hazard and Flood Zone XS - which constitutes areas within the 500-year flood plain. The site is classified as a PEM1C Freshwater Emergent Wetland (palustrine system, emergent class, subclass persistent, and water regime seasonally flooded). Loko Ea Stream is located to the south of the site and flows into a PABH Freshwater Pond (palustrine system, class aquatic bed, water regime permanently flooded). The DEA should address the potential environmental impacts associated with each of these issues.

SMA Use Permit No. 84/SMA-78 was approved with conditions for the Kawailoa Refuse Transfer Station. SMA Use Permit No. 2002/SMA-55 was a major modification to the existing transfer station to better accommodate the collection and storage of green waste and distribution of mulch by extending the tipping area and adding a paved mulch distribution area and an operator's building. The DEA should discuss how the proposed changes affect these earlier approvals.

The Kawailoa Transfer Station is considered a public use and structure. The DEA should acknowledge and address the items described with sufficient information to determine whether a new SMA Use Permit is required, or if a modification to the former approvals is appropriate.

This letter is not a disclosure statement nor is it intended to substitute for mandatory disclosures in real estate transactions regarding the subject parcel. The City is under no obligation to investigate, research, or participate in the preparation of disclosure statements other than providing available public records. This letter does not create liability on the part of the City, or any officer or employee thereof, if used in or as a disclosure statement. The seller, buyer, lender, or their agent, not the City, is solely responsible for the use of any public record information in the preparation of a disclosure statement.

Should you have any questions, please contact Lena Phomsouvanh, of the Zoning Regulations and Permits Branch, at 768-8052 or by email lena.phomsouvanh@honolulu.gov.

Very truly yours,

For: Kathy K. Sokugawa
Acting Director

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
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January 13, 2021

Ms. Kathy K. Sokugawa
Acting Director
City and County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
O‘ahu, Waialua District, Kawailoa Ahupua‘a
TMK: (1) 6-1-005:018 (por.)

Dear Ms. Sokugawa,

Thank you for your comment letter dated September 9, 2020 concerning the Early Consultation for Draft Environmental Assessment (EA) for the proposed Kawailoa Transfer Station Green Waste Recycling Improvements project, located at 62-180 Kawailoa Drive, Hale‘iwa, Hawai‘i 96712.

We would like to make a correction to the original project description from the August 24, 2020 early consultation letter. This project will not involve mulch distribution nor will a paved mulch distribution area be added. The following is in response to the remainder of your comments.

The Draft EA will address the potential environmental impacts with the property located in the Special Management Area in designated Flood Zone D and Flood Zone XS. Additionally, although the property that is classified as a PEM1C Freshwater Emerged Wetland and the Loko Ea Stream is located south of the property, there are no wetlands present in the Project improvement area and no wetlands will be affected.

The previous SMA Use Permits for this property will be re-examined to determine whether a new SMA Use Permit is required, or if a modification to the former approvals is appropriate. The DEA will discuss how the proposed changes affect these earlier approvals, if at all.

We appreciate your input and participation in this review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC., dba G70

Jeffrey H. Overton, AICP, LEED AP
Principal

cc: Josh Nagashima, ENV

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

KIRK CALDWELL
MAYOR

SUSAN BALLARD
CHIEF

JOHN D. McCARTHY
CLYDE K. HO
DEPUTY CHIEFS

OUR REFERENCE EO-DK

September 1, 2020

Ms. Barbara Natale, AICP
Group 70 International, Inc. (DBA G70)
111 South King Street, Suite 170
Honolulu, Hawaii 96813

Dear Ms. Natale:

This is in response to a letter dated August 20, 2020, from the Department of Environmental Services, requesting input on an Early Consultation for a Draft Environmental Assessment. The project involves the expansion of the City and County of Honolulu's Kawailoa Transfer Station located in Haleiwa.

The Honolulu Police Department has reviewed the plans and does not have any comments or concerns at this time.

If there are any questions, please call Major Dagan Tsuchida of District 2 (Wahiawa) at 723-8703.

Thank you for the opportunity to review this project.

Sincerely,

RADE K. VANIC
Acting Assistant Chief of Police
Support Services Bureau

cc: Mr. Josh Nagashima
Department of Environmental Services

111 S. King Street
Suite 170
Honolulu, HI 96813
808.523.5866
www.g70.design

January 13, 2021

Rade K. Vanic
Acting Assistant Chief of Police
Support Services Bureau
City and County of Honolulu
Police Department
801 South Beretania Street
Honolulu, HI 96813

Subject: Early Consultation for Draft Environmental Assessment
Kawailoa Transfer Station Green Waste Recycling Improvements
O‘ahu, Waialua District, Kawailoa Ahupua‘a
TMK: (1) 6-1-005:018 (por.)

Dear Chief Vanic,

Thank you for your comment letter dated September 1, 2020 concerning the Early Consultation for Draft Environmental Assessment (EA) for the proposed Kawailoa Transfer Station Green Waste Recycling Improvements project, located at 62-180 Kawailoa Drive, Hale‘iwa, Hawai‘i 96712.

We acknowledge that the Honolulu Police Department has no comments or concerns at this time.

A copy of the Draft EA will be provided to your office. Thank you for your participation in the environmental review process.

Sincerely,

GROUP 70 INTERNATIONAL, INC., dba G70

Jeffrey H. Overton, AICP, LEED AP
Principal

cc: Josh Nagashima, ENV

Draft Environmental Assessment Comment Letters

Barbara Natale

From: Maaninen, Michael A CIV USARMY CEPOH (USA) <Michael.A.Maaninen@usace.army.mil>
Sent: Tuesday, February 16, 2021 10:05 AM
To: 220039-01 Kawailoa TS
Subject: Scoping Comments for Kawailoa Transfer Station Improvements

Aloha Jeff,
The US Army Corps of Engineers (Corps) received your request for comments or input on Improvements to the Kawailoa Transfer Station. After review of the draft Environmental Assessment (EA), our comments pertaining to our Regulatory program will be general at this point.

A Department of the Army permit is needed if work occurs in Waters of the United States (WOTUS) under Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act. When your project is being developed, we ask that you identify areas that may fall within the Corps jurisdiction as WOTUS such as streams, rivers, and wetlands. Our first requirement is to avoid impacts to our WOTUS. If impacts are unavoidable (such as a stream crossing), then a permit will be needed from the Corps.

If a permit is needed from the Corps, then would require an application be provided. We must also evaluate the project for any impacts to resources such as threatened or endangered species, historic properties, and/or essential fish habitat, and consult if necessary.

A permit is not required if all work being done is located in uplands.

Please let me know if you have any questions and I'll be happy to discuss. Thank you -Michael

Michael Maaninen
Biologist
Regulatory Office
Honolulu District
U.S. Army Corps of Engineers
Building 252 Fort Shafter, HI 96858-5440
Phone: (808) 835-4307
Fax: (808) 835-4126
Michael.A.Maaninen@usace.army.mil

Barbara Natale

From: Seto, Joanna L <joanna.seto@doh.hawaii.gov>
Sent: Wednesday, January 27, 2021 1:23 PM
To: 220039-01 Kawailoa TS
Subject: DEA Kawailoa Transfer Station Improvements

Aloha Mr. Overton,

Mahalo for your January 23, 2021 letter regarding the Kawailoa Transfer Station Improvements in Kawailoa, Waialua District, Oahu. The Department of Health, Safe Drinking Water Branch (SDWB) has updated our standard comments and will no longer be responding directly to requests for comments on the following documents (Pre-consultation, Early Consultation, Preparation Notice, Draft, Final, Addendums, and/or Supplements):

- Environmental Impact Statements (EIS)
- Environmental Assessments (EA)
- Conservation District Use Applications (CDUA)
- Drinking Water Operator Certification
- Source Water Assessment and Protection
- Underground Injection Control (UIC) Wells

Please download the SDWBStdCmts2020.docx – signed.pdf for our standard comments regarding your project's responsibilities to maintain drinking water quality and any necessary permitting. The SDWB will not provide direct responses to these requests. Agencies and/or project coordinators may download and use this memo as the SDWB's official comments.

Mahalo,
Joanna

Joanna L. Seto, P.E.
Engineering Program Manager
Safe Drinking Water Branch | State of Hawaii, Department of Health
Uluakupu Building 4 | 2385 Waimano Home Road, Suite 110 | Pearl City, HI 96782-1400
Phone: (808) 586-4259
Cell: (808) 292-8408

*Please consider financing your drinking water projects with **low cost** loans. Contact Ms. Joan Corrigan or Ms. Stefanie Weaver at (808) 586-4258 for more information on the benefits of using Drinking Water State Revolving Fund (DWSRF) Loans. Like us on **Facebook** and follow us on **Twitter**.*

Notice: This information and attachments are intended only for the use of the individual(s) or entity to which it is addressed, and may contain information that is privileged and/or confidential. If the reader of this message is not the intended recipient, any dissemination, distribution, or copying of this communication is strictly prohibited and may be punishable under state and federal law. If you have received this communication and/or attachments in error, please notify the sender via e-mail immediately and destroy all electronic and paper copies.

DAVID Y. IGE
GOVERNOR OF HAWAII

ELIZABETH A. CHAR, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
SAFE DRINKING WATER BRANCH
ULUAKUPU BLDG. 4
2385 WAIMANO HOME ROAD, SUITE 110
PEARL CITY, HI 96782

In reply, please refer to:
File: SDWB
SDWBStdCmts2020.docx

November 27, 2020

MEMORANDUM

TO: AGENCIES AND PROJECT OWNERS

FROM: JOANNA L. SETO, P.E., CHIEF
Safe Drinking Water Branch

SUBJECT: SAFE DRINKING WATER BRANCH STANDARD PROJECT COMMENTS

This memo is provided for your information and sharing. You are encouraged to share this memo with your project partners, team members, and appropriate personnel.

The Department of Health (DOH), Safe Drinking Water Branch (SDWB) will no longer be responding directly to requests for comments on the following documents (Pre-consultation, Early Consultation, Preparation Notice, Draft, Final, Addendums, and/or Supplements):

- Environmental Impact Statements (EIS)
- Environmental Assessments (EA)
- Conservation District Use Applications (CDUA)
- Drinking Water Operator Certification
- Source Water Assessment and Protection
- Underground Injection Control (UIC) Wells

For agencies or project owners requiring DOH-SDWB comments for one or more of these documents, please utilize the DOH-SDWB Standard Comments below regarding your project's responsibilities to maintain drinking water quality and any necessary permitting. DOH-SDWB Standard Comments are also available on the DOH-SDWB website located at: https://health.hawaii.gov/sdwb/.

DOH-SDWB Standard Comments

The following information is for agencies and/or project owners who are seeking comments regarding environmental compliance for their projects in the areas of: 1) Public Water Systems; 2) Underground Injection Control; 3) Groundwater Protection, and 4) Drinking Water State Revolving Fund with the Hawaii Administrative Rules (HAR), Chapters 11-19, 11-20, 11-21, 11-23, 11-23A, 11-25, and 11-65. You may be responsible for fulfilling additional requirements related to our program.

1. Public Water System Supervision
   a. Federal and state regulations define a public water system as a system that regularly serves an average of 25 or more individuals at least 60 days per year or has at least 15 service connections providing water for human consumption. All public water system owners and operators are required to comply with Hawaii Administrative Rules (HAR), Title 11, Chapter 20, "Rules Relating to Public Water Systems."
   b. All new public water systems are required to demonstrate and meet minimum capacity requirements prior to their establishment. This requirement involves demonstration that the system will have satisfactory technical, managerial, and financial capacity to enable the system to comply with safe drinking water standards and requirements.
   c. Projects that propose development of new sources of drinking water serving or proposed to serve a public water system must comply with the terms of HAR 11-20-29, entitled "Use of new sources of raw water for public water systems." This section requires that all new public water system sources be approved by the Director of Health (Director) prior to its use. Such approval is based primarily upon the submission of a satisfactory engineering report, which addresses the requirements set in HAR Section 11-20-29.
   d. The engineering report must identify all potential sources of contamination and evaluate alternative control measures, which could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source. In addition, water quality analyses for all regulated contaminants, performed by a laboratory certified by the DOH State Laboratories Division (https://health.hawaii.gov/sdwb/approvedlablist/), must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional parameters may be required by the Director for this submittal or additional tests required upon his or her review of the information submitted.
   e. All sources of public water systems must undergo a source water assessment, which will delineate a source water protection area. This process is preliminary to the creation of a source water protection plan for that source and activities which will take place to protect the drinking water source.
   f. Projects proposing to develop new public water systems or proposing substantial modifications to existing public water systems must receive approval by the Director prior to construction of the proposed system or modification. These projects include treatment, storage, and distribution systems of public water systems. The approval authority for projects owned and operated by a County Board or Department of Water or Water Supply has been delegated to them.

g. All public water systems must be operated by certified distribution system and water treatment plant operators as defined by HAR Chapter 11-25, entitled "Rules Relating to Certification of Public Water System Operators."

h. All projects which propose the use of dual water systems or the use of a non- potable water system in proximity to an existing drinking water system to meet irrigation or other needs must be carefully designed and operated these systems to prevent the cross-connection of these systems and prevent the possibility of backflow of water from the non-potable system to the drinking water system. The two (2) systems must be clearly labeled and physically separated by air gaps or reduced pressure principle backflow prevention devices to avoid contaminating the drinking water supply. In addition, backflow devices must be tested annually to assure their proper operation. Further, all non-potable spigots and irrigated areas should be clearly labeled with warning signs to prevent the inadvertent consumption on non-potable water. Compliance with HAR Chapter 11-21, entitled "Cross-Connection and Backflow Control" is also required.

i. All projects which propose the establishment of a potentially contaminating activity (as identified in the Hawai`i Source Water Assessment Plan) within the source water protection area of an existing source of water for a public water supply should address this potential and activities that will be implemented to prevent or reduce the potential for contamination of the drinking water source.

For further information concerning the application of capacity, new source approval, operator certification, source water assessment, backflow/cross-connection prevention or other regulated public water system programs, please contact the Safe Drinking Water Branch Engineering Section at (808) 586-4258 or email sdwb@doh.hawaii.gov.

2. Underground Injection Control (UIC) Program

a. Injection wells used for the subsurface disposal of wastewater, sewage effluent, or surface runoff are subject to environmental regulation and permitting under HAR Chapter 11-23 entitled "Underground Injection Control." The DOH's approval must be first obtained before any injection well construction commences. A UIC permit must be issued before any injection well operation occurs.

b. Authorization to use an injection well is granted when a UIC permit is issued to the injection well facility. The UIC permit contains discharge and operation limitations, monitoring and reporting requirements, and other facility management and operational conditions. A complete UIC permit application form found at https://eha-cloud.doh.hawaii.gov/epermit/Home/9034789e-2918-4f30-82a2-9a5940e467f2 is needed to apply for a UIC permit.

c. A UIC permit can have a valid duration of up to five (5) years. Permit renewal is needed to keep an expiring permit valid for another term.

d. The UIC line delineates the extent of our underground sources of drinking water and is used to define areas where certain types of injection wells are prohibited. The UIC line is plotted on official UIC maps available for review at SDWB or by contacting the UIC program. Online interpretations of the UIC line maps exists and should be used with

caution as they are not the official maps. One website hosting an interpretation of the UIC line map is at the following: https://geoportal.hawaii.gov/datasets/4597dde2703a4e539f51588531e48101_20

e. If your project involves the construction of an injection well, you must first obtain the DOH's written approval to construct the injection well before any construction commences. The primary purpose of HAR, Chapter 11-23 is to protect underground sources of drinking water from injection well contamination. Written approval is obtained by filing an application for a UIC permit. You may submit your permit application via electronic filing (preferred method) through the DOH website at http://eha_cloud.hawaii.gov/epermit or submit a hard copy permit application to:

   Safe Drinking Water Branch
   Uluakupu Bldg. 4
   2385 Waimano Home Road, Suite 110
   Pearl City, Hawaii 96782-1400

f. Areas mauka of the UIC line are considered to overlie underground sources of drinking water. Therefore, no new subclass A injection wells, such as sewage injection wells that receive greater than 1,000 gallons per day, will be allowed to be constructed.

g. New sewage injection wells have been further prohibited effective July 5, 2018. Hawaii Revised Statutes 340E-2(e) states *"The director shall promulgate regulations establishing an underground injection control program. Such program shall prohibit any underground injection which is not authorized by a permit issued by the director; provided that the director shall not issue permits for the construction of sewage wastewater injection wells unless alternative wastewater disposal options are not available, feasible, or practical;"*

h. New storm water drainage injection well construction must be sited beyond one-quarter mile of a drinking water well. If you intend to construct a drinking water well, be careful to site all drainage injection wells at least one-quarter mile away from the drinking water source well.

For further information about the UIC permit and the UIC Program, please contact UIC staff at (808) 586-4258 or email at sdwb@doh.hawaii.gov.

3. Drinking Water State Revolving Fund Program

The Drinking Water State Revolving Fund (DWSRF) is a federally-capitalized loan program that provides low interest loans to regulated community water systems in the State of Hawaii for their drinking water infrastructure projects. If you would like more information regarding DWSRF eligibility, financing options, etc., you may visit the DWSRF website at https://health.hawaii.gov/sdwb/drinking-water-state-revolving-fund/ or contact Ms. Joan Corrigan at joan.corrigan@doh.hawaii.gov.

4. Private Water Wells

   a. **WARNING!** As the owner of a privately-owned well, you should **NOT** assume that water from your well is safe for consumption. It is your responsibility to make sure that your well water is safe to drink. The only way to do this is to have your well regularly tested for bacteriological and chemical contaminants.

   b. There are no regulations controlling water quality in private wells serving individual residences as there are for public water systems (public or privately-owned utilities supplying water to 25 or more people or 15 service connections). In other words, there are no enforceable limits for contaminants and no requirements for regular testing. Private wells are often found in rural areas, where many activities such as onsite wastewater disposal can contaminate the ground water.

   c. U.S. Environmental Protection Agency (EPA) Recommendations: The EPA recommends that private well owners test their well water each year for such contaminants as Total Coliform bacteria, Nitrates, as well as any other contaminants that may be of concern in your area. More frequent testing may be appropriate if you suspect a problem. EPA also suggests that you consider testing for pesticides, organic chemicals, and heavy metals before using it for the first time. Please refer to the EPA website on Private Drinking Water Wells at http://www.epa.gov/privatewells.

   d. Other Contaminants: Water testing can be very expensive. It is important that you spend time to identify what other potential contaminants may be of concern. Please refer to the EPA website on Private Drinking Water Wells for more information. Be aware of what and how you use and dispose of household and garden chemicals. Also determine the location of nearby septic tanks or cesspools, and agricultural or industrial activities in the area. General information on known chemical contamination of ground water in Hawaii can be found at the DOH website http://health.hawaii.gov/sdwb/groundwater-contamination-viewer.

   e. Laboratories: Whenever possible, utilize a laboratory that is certified or approved for the specific drinking water tests and carefully follow their instructions for collecting, storing, and transporting the samples. Be sure to ask the lab to use EPA approved methods for drinking water analysis. A list of Drinking Water Laboratories Certified or Approved by the Hawaii Department of Health, State Laboratories Division can be found at https://health.hawaii.gov/sdwb/approvedlablist/. As lab certification status changes constantly, confirm their status when you contact the lab. Please note that the list is limited to currently regulated contaminants in public water systems.

   f. Results: Once the lab provides you with the test results, you will be in a better position to determine if your well water is safe to drink or what contaminant you need to treat for. Generally, you should compare the results with Federal (https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations) and State (http://health.hawaii.gov/sdwb/files/2014/07/MCL-Fct-2014-07-10.pdf) Maximum Contaminant Level (MCL) drinking water standards. Where your test results are greater than the Federal or State maximum contaminant levels, your well water should be considered as unsafe for consumption.

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 22, 2021

LD 0076

Jeff Overton, Principal
Group 70 International, Inc. dba G70
111 S. King Street, Suite 170
Honolulu, HI 96813

Via email: KawailoaTS@g70.design

Dear Mr. Overton:

SUBJECT: **Draft Environmental Assessment**
Kawailoa Transfer Station Improvements Project
Kawailoa, Waialua District, Island of Oahu, Hawaii
TMK: (1) 6-1-005:018 (por.)

Thank you for the opportunity to review and comment on the subject project. The Land Division of the Department of Land and Natural Resources (DLNR) distributed copies of your request to DLNR's various divisions for their review and comment.

Enclosed are responses received from our (a) Engineering Division and (b) Land Division, Oahu District. Should you have any questions about the attached responses, please feel free to contact Barbara Lee via email at barbara.j.lee@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Enclosures
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

February 2, 2021

G70
111 South King Street, Suite 170
Honolulu, HI 96813
Attn: Jeff Overton, Principal

Log no. 3000

Dear Mr. Overton:

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your inquiry regarding the Draft Environmental Assessment of the Kawailoa Transfer Station improvements in Pūpūkea on O'ahu, Hawai'i, TMK: (1) 6-1-005:018 (por.). The proposed project involves expanding the existing Kawailoa Transfer Station and consists of vegetation clearing, minor grading and excavation, paving and general construction to accomodate: a new vehicle weigh scale; trench drain; leachate holding tank at the existing and proposed loadouts; a new mechanical/electric room and a new 400 square foot office.

The State listed Hawaiian Hoary Bat or 'Ōpe'ape'a (*Lasiurus cinereus semotus*) has the potential to occur in the vicinity of the project area and may roost in nearby trees. If any site clearing is required this should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW.

DOFAW recommends minimizing the movement of plant or soil material between worksites, such as in fill. Soil and plant material may contain invasive fungal pathogens (e.g. Rapid 'Ōhi'a Death), vertebrate and invertebrate pests (e.g. Little Fire Ants, Coconut Rhinoceros Beetles), or invasive plant parts that could harm our native species and ecosystems. We recommend consulting the O'ahu Invasive Species Committee at (808) 266-7994 in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.

State listed waterbirds such as the Hawaiian Duck (*Anas wyvilliana*), Hawaiian Stilt (*Himantopus mexicanus knudseni*), Hawaiian Coot (*Fulica alai*), and Hawaiian Common Gallinule (*Gallinula chloropus sandvicensis*) have the potential to occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, please contact the O'ahu DOFAW Office at (808) 973-9778.

DOFAW is concerned about attracting vulnerable birds to areas that may host nonnative predators such as cats, rodents, and mongoose. Additionally, improvements to the facility are likely to increase human and operational activity and may generate more predator attractants. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.

We note that artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade artifacts or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea. For illustrations and guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawai'i please visit: https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Koa Matsuoka, Protected Species Habitat Conservation Planning Associate at (808) 587-4149 or koa.matsuoka@hawaii.gov.

Sincerely,

DAVID G. SMITH
Administrator

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 08, 2021

LD 0076

MEMORANDUM

FROM:

~~TO:~~ **DLNR Agencies:**
__Div. of Aquatic Resources *(via email: kendall.l.tucker@hawaii.gov)*
__Div. of Boating & Ocean Recreation
X Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
X Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
__Div. of State Parks
X Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
__Office of Conservation & Coastal Lands
X Land Division – Oahu District *(via email: DLNR.Land@hawaii.gov)*

TO:

~~FROM:~~ Russell Y. Tsuji, Land Administrator *Russell Tsuji*

SUBJECT: **Draft Environmental Assessment (DEA), Kawailoa Transfer Station Improvements**

LOCATION: Kawailoa, Waialua District, Island of Oahu, Hawaii; TMK: (1) 6-1-005:018 (por.)

APPLICANT: **G70 on behalf of the City & County of Honolulu, Department of Environmental Services, Refuse Division**

Transmitted for your review and comment is information on the above-referenced subject. The DEA was published on January 23, 2021 in the Office of Environmental Quality Control's periodic bulletin, The Environmental Notice, at the following link:

http://oeqc2.doh.hawaii.gov/The_Environmental_Notice/2021-01-23-TEN.pdf

Please submit any comments by **February 19, 2021** to DLNR.Land@hawaii.gov, and copied to barbara.j.lee@hawaii.gov and darlene.k.nakamura@hawaii.gov. If no response is received by this date, we will assume your agency has no comments. If you have any questions, please contact Barbara Lee directly via email at barbara.j.lee@hawaii.gov. Thank you.

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(✓) Comments are attached.

Signed: CSC
Print Name: Carty S. Chang, Chief Engineer
Division: Engineering Division
Date: Feb 12, 2021

Attachments
Cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: Draft Environmental Assessment (DEA), Kawailoa Transfer Station Improvements
Location: Kawailoa, Waialua District, Island of Oahu, Hawaii
TMK(s): (1) 6-1-005:018 (por.)
Applicant: G70 on behalf of the City & County of Honolulu, Department of Environmental Services, Refuse Division

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4896.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: Feb 12, 2021

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 08, 2021

LD 0076

MEMORANDUM

TO: **DLNR Agencies:**
___Div. of Aquatic Resources *(via email: kendall.l.tucker@hawaii.gov)*
___Div. of Boating & Ocean Recreation
_X_Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
_X_Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
___Div. of State Parks
_X_Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
___Office of Conservation & Coastal Lands
_X_Land Division – Oahu District *(via email: DLNR.Land@hawaii.gov)*

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: **Draft Environmental Assessment (DEA), Kawailoa Transfer Station Improvements**
LOCATION: Kawailoa, Waialua District, Island of Oahu, Hawaii; TMK: (1) 6-1-005:018 (por.)
APPLICANT: **G70 on behalf of the City & County of Honolulu, Department of Environmental Services, Refuse Division**

Transmitted for your review and comment is information on the above-referenced subject. The DEA was published on January 23, 2021 in the Office of Environmental Quality Control's periodic bulletin, The Environmental Notice, at the following link:

http://oeqc2.doh.hawaii.gov/The_Environmental_Notice/2021-01-23-TEN.pdf

Please submit any comments by **February 19, 2021** to DLNR.Land@hawaii.gov, and copied to barbara.j.lee@hawaii.gov and darlene.k.nakamura@hawaii.gov. If no response is received by this date, we will assume your agency has no comments. If you have any questions, please contact Barbara Lee directly via email at barbara.j.lee@hawaii.gov. Thank you.

( ) We have no objections.
(☑) We have no comments.
( ) We have no additional comments.
( ) Comments are attached.

Signed: _____ BC
Print Name: Patti Miyashiro
Division: DLNR-LAND DIV-ODLO
Date: Feb 8, 2021

Attachments
Cc: Central Files

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

Deputy Director
LYNN A.S. ARAKI-REGAN
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

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

IN REPLY REFER TO:
DIR 0066
HWY-PS 2.5198

February 24, 2021

Mr. Jeff Overton
Principal
Group 70 International, Inc.
111 South King Street, Suite 170
Honolulu, Hawaii 96813

Dear Mr. Overton:

Subject: Request for comments for Draft Environmental Assessment
Kawailoa Transfer Station Expansion
Pupukea, Oahu, Hawaii
Tax Map Key No.: (1) 6-1-005: 018

Thank you for your letter dated January 23, 2021, requesting our comments on the Draft Environmental Assessment (DEA) required by Chapter 343, Hawaii Revised Statutes on the subject project due to the use of City lands and City funds. The DEA review is related to the existing Special Management Area Permits, Nos. 2002/SMA-55 and 84/SMA-78.

The proposed work includes the expansion of an existing and green waste recycling station. The project improvements will provide additional office building, restroom, second loadout station, storage and collection area totaling 28,000 square feet to the property. The project involves the construction of a 400-square-foot office structure and various improvements that will also require excavating, grading, and clearing of vegetation at the site. The station will be supported by daily operations including the receiving and transferring of County refuse and green waste. This particular station will also be opened to the general public as a drop off convenience center for refuse and recycling. The site's primary access is off State Kamehameha Highway (Route 83) via Kawailoa Drive, a County roadway.

Based on the DEA and the conclusions of the Traffic Impact Analysis Report dated December 2, 2020, the operation and the proposed work does not appear to generate significant traffic impacts onto the State facility.

If you have any questions, please contact Jeyan Thirugnanam, Systems Planning Engineer, Highways Division, Planning Branch at (808) 587-6336 or by email at jeyan.thirugnanam@hawaii.gov. Please reference file review number PS 2021-019.

Sincerely,

JADE T. BUTAY
Director of Transportation

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

RICK BLANGIARDI, MAYOR

BRYAN P. ANDAYA, Chair
KAPUA SPROAT, Vice Chair
RAY C. SOON
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ROGER BABCOCK, Jr., Ex-Officio

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

March 2, 2021

TO: MANUEL S. LANUEVO, P.E., DBIA, LEED AP, CHIEF ENVIRONMENTAL SERVICES DEPARTMENT

ATTN: JOSH NAGASHIMA, REFUSE DIVISION

FROM: ERNEST Y. W. LAU, P.E., MANAGER AND CHIEF ENGINEER

SUBJECT: LETTER DATED JANUARY 12, 2021 REQUESTING COMMENTS ON CHAPTER 343, HAWAII REVISED STATUTES (HRS) DRAFT ENVIRONMENTAL ASSESSMENT KAWAILOA TRANSFER STATION IMPROVEMENTS AT 62-180 KAWAILOA DRIVE, HALEIWA
TAX MAP KEY: 6-2-005: 018

Thank you for the opportunity to comment on the proposed transfer station improvement project.

The existing water system cannot provide adequate off-site fire protection to the transfer station improvement project. The nearest fire hydrant, Fire Hydrant No. C-00056, is located on Kamehameha Highway, which is more than 1,840 linear feet from the project site. The water system improvements are extensive.

The parcel has an existing water service. If additional water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission, and daily storage.

Water conservation measures are required for the proposed developments. These measures include utilization of nonpotable water for irrigation using rain catchment, drought tolerant plants, xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets.

The proposed project is subject to Board of Water Supply Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.

The construction drawings should be submitted for our review. The construction schedule should be coordinated to minimize impact to the water system.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

RICK BLANGIARDI
MAYOR

ALEX KOZLOV, P.E.
DIRECTOR

HAKU MILLES, P.E.
DEPUTY DIRECTOR

February 22, 2021

SENT VIA EMAIL

Mr. Jeff Overton
KawailoaTS@g70.design

Dear Mr. Overton,

Subject: Chapter 343 HRS Draft Environmental Assessment (EA)
Kawailoa Transfer Station Improvements
TMK: (1) 6-1-005:018 (por.)
Kawailoa, Waialua District, Oahu, Hawaii

Thank you for the opportunity to review and comment. The Department of Design and Construction does not have any comments to offer at this time.

Should you have any further questions, please contact me at 768-8480.

Sincerely,

FOR Alex Kozlov, P.E.
Director

AK:cf (839245)

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Ulu`ohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

RICK BLANGIARDI
MAYOR

ROGER BABCOCK, JR., Ph.D., P.E.
DIRECTOR AND CHIEF ENGINEER DESIGNATE

TYLER K. SUGIHARA, P.E.
ACTING DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 21-51

RECEIVED
FEB 16 2021
G70

February 10, 2021

Mr. Jeff Overton, AICP, LEED AP
G70
111 S. King Street, Suite 170
Honolulu, Hawaii 96813

Dear Mr. Merz:

Subject: Chapter 343, HRS and Draft Environmental Assessment for the Kawailoa Transfer Station Improvements
TMK: (1) 6-1-005:018 (por.)

Thank you for the opportunity to review and comment on the subject project.

Our comments are as follows:

- During construction and upon completion of the project, any damages/deficiencies along the City maintained portion of the roadway on Kawailoa Drive (Kamehameha Highway to the cattle gate) shall be repaired to City standards and accepted by the City and at no cost to the City and County of Honolulu.

If you have any questions, please call Mr. Kyle Oyasato of the Division of Road Maintenance at 768-3697.

Sincerely,

Roger Babcock, Jr., Ph.D., P.E.
Director and Chief Engineer Designate

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

FILE

RICK BLANGIARDI
MAYOR

DEAN UCHIDA
DIRECTOR

DAWN TAKEUCHI APUNA
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

February 22, 2021 2020/ELOG-178(LP)

Mr. Jeff Overton, Principal
G70
1111 South King Street, Suite 170
Honolulu, Hawaii 96813

Dear Mr. Overton:

SUBJECT: Kawailoa Transfer Station
Draft Environmental Assessment
62-180 Kawailoa Drive - Haleiwa
Tax Map Key 6-1-005: 018

This is in response to your letter, received January 25, 2021, requesting comments on the Draft Environmental Assessment (EA) prepared for the subject Project in compliance with Chapter 343, Hawaii Revised Statures (HRS). The following are our comments for the items to address in the Draft EA:

1. A portion of the Project site is within the Special Management Area (SMA) and Section 2.6 of the Draft EA suggests an SMA Use Permit is required for the Project. The Final EA should include a figure showing the SMA boundary on a site plan to clearly show which elements of the Project are within the SMA. The Final EA should also specify whether any elements of the Project would not be considered "development" for purposes of Section 25-1.3, Revised Ordinances of Honolulu. Finally, a cost estimate of those elements of the Project that are in the SMA and are considered "development" should be provided, unless it is clear the cost exceeds $500,000.

2. Section 5.4 of the Draft EA states the Project will comply with the development standards of the AG-1 Restricted Agricultural District. The Final EA should include a discussion of whether there is a possibility that the equipment or structures will ultimately need to exceed the height limit. If that is a possibility, a Zoning Waiver should be added to the list of potentially necessary permits and approvals.

3. The Project must comply with the prevailing soil erosion and storm water quality standards and the Rules Relating to Water Quality. This will be confirmed during the development and building permit stage of development. However, the Final EA should describe the types of best management practices and other measures that will be employed to comply with these requirements.

Thank you for the opportunity to comment on this proposal. Should you have any questions, please contact Lena Phomsouvanh, of our staff, at (808) 768-8052 or lena.phomsouvanh@honolulu.gov.

Very truly yours,

For: Dean Uchida
Director

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • web: www.honolulu.gov

RICK BLANGIARDI
MAYOR

J. ROGER MORTON
DIRECTOR DESIGNATE

JON Y. NOUCHI
DEPUTY DIRECTOR

RECEIVED
MAR 01 2021
G70

TP2/20-823934

February 24, 2021

Jeff Overton, Principal
G70
111 South King Street, Suite 170
Honolulu, Hawaii 96813

Dear Mr. Overton:

SUBJECT: Chapter 343, Hawai'i Revised Statutes (HRS) Draft Environmental Assessment Kawailoa Transfer Station Improvements
Tax Map Key (TMK): (1) 6-1-005:018 (por.)
Kawailoa, Waialua District, O'ahu, Hawai'i

Thank you for the opportunity to provide written comments regarding the subject project. We have the following comments.

1. **Transportation Impact Assessment (TIA).** The applicant should monitor the development status so that should circumstances change, either project based or in the project environs, the TIA can be modified to reflect the change. Of particular interest is the intersection of Kawailoa Drive and Kamehameha Highway.

   The applicant shall submit all native files (e.g., Synchro, Excel, etc.) for the raw multi-modal counts and accompanying analyses to the Regional Planning Branch (RPB) at dtsplanningdiv@honolulu.gov. Please refer to the Department of Transportation Services (DTS) TIA Guide for multimodal assessment tools and recommended analyses. The TIA Guide can be found at http://www4.honolulu.gov/docushare/dsweb/View/Collection-7723.

2. **Street Condition.** Any damage to the existing roadway and sidewalk area caused by the project should be restored to its original or better condition.

3. **Clean Streets**. Best Management Practice controls should be included at the construction site to prevent trailing of dirt and debris on Kawailoa Drive and City roadways.

4. **Neighborhood Impacts**. The area representatives, neighborhood board, as well as the area residents, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.

5. **Disability and Communication Access Board (DCAB)**. Project plans (vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by DCAB to ensure full compliance with Americans with Disabilities Act (ADA) requirements.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Scott Brady, of my staff, at 768-6693.

Very truly yours,

J. Roger Morton
Director Designate

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

RICK BLANGIARDI
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

RECEIVED
FEB 16 2021
G70

February 10, 2021

Mr. Jeff Overton, Principal
Group 70
111 South King Street, Suite 170
Honolulu, Hawaii 96813

Dear Mr. Overton:

Subject: Draft Environmental Assessment
Kawailoa Transfer Station Improvements
62-180 Kawailoa Drive
Kawailoa, Oahu, Hawaii
Tax Map Key: 6-1-005: 018 (Portion)

In response to your letter dated January 23, 2021, regarding the abovementioned subject, the Honolulu Fire Department (HFD) reviewed the submitted information and requires that the following be complied with:

1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet (46 meters) from fire department access roads as measured by an approved route around the exterior of the building or facility. (National Fire Protection Association [NFPA] 1; 2012 Edition, Sections 18.2.3.2.2 and 18.2.3.2.2.1.)

   A fire department access road shall extend to within 50 feet (15 meters) of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1; 2012 Edition, Section 18.2.3.2.1.)

2. A water supply approved by the county, capable of supplying the required fire flow for fire protection shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet (45,720 millimeters) from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ [Authority Having Jurisdiction]. (NFPA 1; 2012 Edition, Section 18.3.1, as amended.)

3. The unobstructed width and unobstructed vertical clearance of a fire apparatus access road shall meet county requirements. (NFPA 1; 2012 Edition, Sections 18.2.3.4.1.1 and 18.2.3.4.1.2, as amended.)

4. Submit civil drawings to the HFD for review and approval.

Should you have questions, please contact Acting Battalion Chief Timothy Caires of our Fire Prevention Bureau at 723-7094 or tcaires@honolulu.gov.

Sincerely,

JASON SAMALA
Assistant Chief

JS/EO:bh

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

RICK BLANGIARDI
MAYOR

SUSAN BALLARD
CHIEF

JOHN D. McCARTHY
AARON TAKASAKI-YOUNG
DEPUTY CHIEFS

OUR REFERENCE EO-DK

February 3, 2021

SENT VIA EMAIL

Mr. Jeff Overton, Principal
KawailoaTS@g70.design

Dear Mr. Overton:

This is in response to your letter of January 23, 2021, requesting input on the Draft Environmental Assessment for the City and County of Honolulu's Kawailoa Transfer Station Improvements project.

The Honolulu Police Department has reviewed the plans and does not have any comments or concerns at this time.

If there are any questions, please call Acting Major Gordon Lum Kee of District 2 (Wahiawa) at 723-8703.

Thank you for the opportunity to review this project.

Sincerely,

RADE K. VANIC
Assistant Chief of Police
Support Services Bureau

Section 8

List of References

Chapter 8

List of References

City and County of Honolulu Department of Environmental Services. 2019.
Draft 2019 Integrated Solid Waste Management Plan Update. Prepared by Jacobs Engineering Group, Inc.

City and County of Honolulu Department of Land Utilization. 1987.
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U.S. Geological Survey (USGS). 2015.
Seismic Design Maps for International Building Code.

Appendices

Appendix A

Natural Resources Assessment

A natural resources assessment for the Kawailoa Refuse Transfer Station, Kawailoa, Oʻahu

November 13, 2020 *AECOS* No. 1639B

Eric B. Guinther and Bryson Luke
AECOS Inc.
45-939 Kamehameha Highway Suite 104
Kāneʻohe, Hawaiʻi 96744
Phone: (808) 234-7770 Fax: (808) 234-7775 Email: guinther@aecos.com

Introduction

The City & County of Honolulu (C&C), is proposing to undertake various improvements to the Kawailoa Transfer Station (Convenience Center; herein, the "Project") off Kawailoa Drive in Kawailoa on the north shore of Oʻahu (Figure 1). *AECOS* Inc. was requested by Element Environmental (E2) and Group 70 (G70) to conduct a natural resources survey of the Project site and prepare this report of findings[1].

Site Description

The Project site is the existing Kawailoa Transfer Station (Figure 3), to remain as presently configured, proposed improvements comprising of a new office structure, corrosion repairs, expanding the loadout pad to create a new loadout tunnel, and paving/repaving of driveway and refuse storage areas. The site is cut into a hillslope and designed to enable refuse from individual vehicles to be dumped into transport trucks via an overhead hopper. In addition to the transfer set-up, parts of the site serve for truck parking, white goods storage, and materials recycling storage. A shallow drainage channel runs east to west through the site, draining via a culvert lower ground across Kawailoa Drive. A new drainage swale is proposed along the south property line just inside the fence parallel to Kawailoa Drive.

[1] This report is intended to become part of the public record and incorporated into an EA for the subject project.

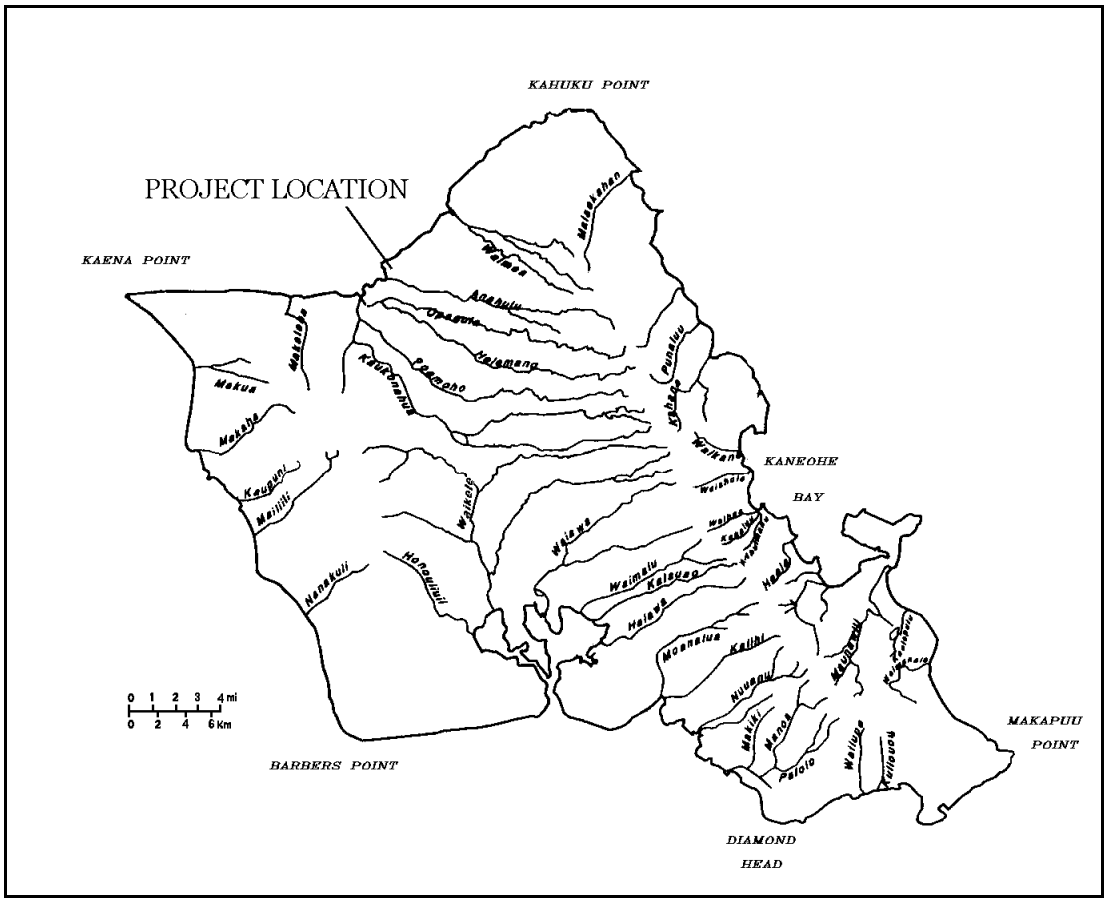

Figure 1. Project location on the north shore of O'ahu.

Methods

Botanical Survey

The natural resources survey of flora in the Project area was undertaken by the authors on November 11, 2020. The survey was recorded on a Trimble 6000 Series GNSS unit (Trimble GeoXH), providing guidance in real time on location and adequacy of coverage during a wandering (pedestrian) transect. The many ornamental plants maintained in pots were not identified and listed as part of our survey.

Plant species were identified as they were encountered. Plant species names follow *Manual of the Flowering Plants of Hawai'i* (Wagner, Herbst, & Sohmer,

1990; Wagner & Herbst, 1999) for native and naturalized flowering plants, and *A Tropical Garden Flora* (Staples & Herbst, 2005) for ornamental plants. More recent name changes for naturalized plant species follow Imada (2019).

Figure 2. C&C Kawailoa Convenience Center survey area (outlined in red).

Terrestrial Vertebrates Survey

Avian Survey

The survey of avian fauna in the Project area was undertaken by Bryson Luke on November 11, 2020. Two, 8-minute avian point-count stations were established at the Project site and counts made in the early morning hours when birds are most active. Weather conditions at the time were no rain (although a shower had passed through prior to the start of the first count) and winds light to variable (0 to 10 mph) from the east.

Figure 3. View of Kawailoa Transfer Station from the front entrance gate.

Birds were identified to species by visual observation aided by Leica 8x42 binoculars, and by listening for vocalizations. The avian phylogenetic order and nomenclature used in this report follow the AOS *Check-List of North and Middle American Birds* 2018 (Chesser et al., 2019,2020) and the *Hawaii Islands Bird Checklist* 2017 (VanderWerf et al., 2018).

Mammalian Survey

We compiled a list of mammals encountered in the survey area. Mammalian phylogenetic order and nomenclature follow *Mammal Species of the World* (Wilson and Reeder, 2005).

Results

Vegetation

Project site vegetation is mostly weedy growth with a few scattered trees planted as part of the landscaping (mostly date palms, *Phoenix* hybrid) and tall kiawe (*Prosopis pallida*), the latter located just off the property (Fig. 3, above). A majority of the area is actively used for car and truck access, parking, and various refuse storage (see Figure 4). The property is bordered by dense grassy slopes (mostly Guinea grass or *Megathyrsus maximum*) and shrubland (*koa haole* or *Leucaena leucocephala*) on the west; a forest is present to the east. Landscaping consisting of a wide variety of ornamentals (mostly bromeliads), many in pots, lines the lower east margin of the site.

Figure 4. View of Kawailoa Transfer Station looking west towards the entrance gate. Transfer loadout hopper on right.

Flora

Table 1 is a listing of ferns and flowering plants (angiosperms) observed during the survey with 64 taxa identified from the survey area. This count is large considering the size of the property, but understandable in light of the regular disturbance of most areas and likelihood of constant accidental introductions from users of the facility. None of the species recorded are native plants, although three are early (precontact) Polynesian introductions. All three of these species are commonly occurring species of no special cultural significance.

Table 1. Plant species observed at the Kawailoa Transfer Station.

Species listed by family	Common name	Status	Abundance	Notes
PTERIDOPHYTES - FERNS & FERN ALLIES				
POLYPODIACEAE				
Phymatosorus grossus (Langsd. & Fisch.) Brownlie	*laua'e*	Nat	U	<2>
FLOWERING PLANTS				
DICOTYLEDONES				
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat	U	
Ruellia brittoniana E. Leonard	---	Nat	R	<2>
AIZOACEAE				
Trianthema portulacastrum L.	---	Nat	O	
AMARANTHACEAE				
Alternanthera pungens Kunth	khaki weed	Nat	O	
Amaranthus spinosus L.	spiny amaranth	Nat	U	
Amaranthus viridus L.	slender amaranth	Nat	U	
ARALIACEAE				
Schefflera actinophylla (Endl.) Harms	octopus tree	Nat	R	
ASTERACEAE				
Bidens alba (L.) DC.	*kī*	Nat	O	
Bidens pilosa L.	*kī*	Nat	R	
Calyptocarpus vialis Less.	---	Nat	O	
Conyza bonariensis (L.) Cronq.	hairy horseweed	Nat	R	
Pluchea x fosbergii Cooper & Galang	---	Nat	R	<3>
Sphagneticola trilobata L.	wedelia	Nat	U	

Table 1 (continued).

Species listed by family	Common name	Status	Abundance	Notes
BRASSICACEAE				
Lepidium virginicum L.	---	Nat	U	
CARICACEAE				
Carica papaya L.	papaya	Nat	R	
CLUSIACEAE				
Clusia rosea Jacq.	autograph tree	Nat	R	
CONVOLVULACEAE				
Ipomoea obscura (L.) Ker-Gawl.	---	Nat	O	
Ipomoea triloba L.	little bell	Nat	R	
EUPHORBIACEAE				
Euphorbia hirta L.	garden spurge	Nat	U	
Euphorbia hypericifolia L.	graceful spurge	Nat	U	
Euphorbia prostrata Aiton	prostrate spurge	Nat	U	
Phylanthus tenellus Roxb.	---	Nat	R	
Ricinus communis L.	castor bean	Nat	R	
FABACEAE				
Crotalaria incanum L.	fuzzy rattlepod	Nat	R	<3>
Desmanthus virgatus (L.) Willd.	virgate mimosa	Nat	R	
Indigofera suffruticosa Mill.	indigo	Nat	R	
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	C	
Neonotonia wightii (Wight & Arnott) Lackey	glycine vine	Nat	C	
Pithecellobium dulce (Roxb.) Benth.	*'opiuma*	Nat	U	
LAURACEAE				
Persea americana Mill.	avocado	Nat	R	
MALVACEAE				
Malvastrum coromandelianum (L.) Garcke	false mallow	Nat	U	
Sida ciliaris L.	---	Nat	A	
Sidastrum micranthum (St. Hill) Frys	---	Nat	A	
MORACEAE				
Ficus microcarpa L. fil.	Chinese banyan	Nat	R	
NYCTAGINACEAE				
Boerhavia coccinea Mill.	false *alena*	Nat	O	
Bougainvillea spectabilis Wild.	bougainvillea	Orn	R	

Table 1 (continued).

Species listed by family	Common name	Status	Abundance	Notes
OXALIDACEAE				
Oxalis corniculata L.	*'ihi'ai*, yellow wood sorrel	**Pol**	C	
PHYTOLACCACEAE				
Rivina humilis L.	coral berry	Nat	U	
PLANTAGINACEAE				
Plantago lanceolata L.	English plantain	Nat	O	
PORTULACACEAE				
Portulaca oleracea L.	pig weed	Nat	R	
SOLANACEAE				
Nicandra cf. *physalodes* (L.) Gaertn.	Apple of Peru	Nat	R	<3>
FLOWERING PLANTS				
MONOCOTYLEDONES				
AGAVACEAE				
Cordyline fruticosa (L.) A. Chev.	ti; *kī*	**Pol**	R	
Cordyline fruticosa cult.	ti	Orn	U	<2>
Dracaena sanderiana M. T. Masters	sanderiana	Orn	R	<2>
Sansevieria trifasciata Prain	mother-in-law tongue	Orn	R	<2>
ARACEAE				
Epipremnum pinnatum (L.) Engl.	pothos	Nat	R	<2>
Monstera deliciosa Lieb.	monstera	Orn	R	<2>
ARECACEAE				
Phoenix hybrid	date palm	Nat	U	
BROMELIACEAE				
numerous (many potted) spp.		Orn	--	
COMMELINACEAE				
Commelina benghalensis L.	hairy *honohono*	Nat	R	
CYPERACEAE				
Cyperus gracilis R. Br.	McCoy grass	Nat	A	
Cyperus involucratus Rottb.	umbrella sedge	Nat	R	<1>
Fimbristylis ferruginea (L.) Vahl	West Indian fimbry	Nat	O	<1>
LILIACEAE				
Asparagus densiflorus (Kunth) Jessop	asparagus "fern"	Nat	R	<2>
MUSACAEAE				
Musa acuminata Colla	hybrid banana	**Pol**	R	
POACEAE (GRAMINEAE)				
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	Nat	A	

Table 1 (continued).

Species listed by family	Common name	Status	Abundance	Notes
POACEAE (cont.)				
Chloris barbata (L.) Sw.	swollen fingergrass	Nat	O	
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat	C	
Eleusine indica (L.) Gaertn.	wiregrass	Nat	O	
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	Nat	O	
Megathyrsus maximus (Jacq.) B.K. Simon & W.L. Jacobs	Guinea grass	Nat	AA	
Paspalum conjugatum Bergius	Hilo grass	Nat	U	
Urochloa mutica (Forssk.) T.Q. Nguyen	California grass	Nat	U	
ZINGIBERACEAE				
Alpinia purpurata (Viell.) K. Schum.	red ginger	Orn	R	

Legend to Table 1

STATUS = distributional status for the Hawaiian Islands:
- Nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
- Orn = A cultivated plant; a species not thought to be naturalized in Hawai'i.
- **Pol** = An early Polynesian introduction. Introduced before 1778.

ABUNDANCE = occurrence ratings for plant species:
- R – Rare — seen in only one or two locations.
- U - Uncommon — seen at most in several locations.
- O - Occasional — seen with some regularity.
- C - Common — observed numerous times during the survey.
- A - Abundant — found in large numbers; may be locally dominant.
- AA - Very abundant — abundant and dominant; a defining vegetation type.

NOTES:
- <1> - Species seen only within a shallow site drainage swale.
- <2> - Planted among other potted ornamentals.
- <3> – Plant lacks flowers or fruits; identification possibly uncertain.

Avian Fauna

A total of 138 individual birds representing 18 species was recorded from the point-count stations (Table 2). Common Myna (*Acridotheres tristis*), Zebra Dove (*Geopelia striata*), and Domestic Chicken (*Gallus gallus*) were the most common species observed and collectively account for almost half (45%) of the total birds enumerated. Three additional species were observed outside of the timed counts and are listed as incidental species in Table 2. The bird species observed correspond to the disturbed, coastal lowland habitats present at the Project site.

Table 2. Avian species detected on November 11, 2020 survey of C&C Transfer Station in Kawailoa.

ORDER FAMILY *Species*	**Common Name**	**Status**	**Relative Abundance**
GALLIFORMES			
PHASIANIDAE			
Francolinus pondicerianus	Gray Francolin	NN	†
Gallus gallus	Domestic Chicken	NN	9.5
COLUMBIFORMES			
COLUMBIDAE			
Streptopelia chinensis	Spotted Dove	NN	3.5
Geopelia striata	Zebra Dove	NN	10
CHARADRIIFORMES			
CHARADRIIDAE			
Pluvialis fulva	Pacific Golden-Plover, *kōlea*	**IM**	0.5
PELECANIFORMES			
ARDEIDAE			
Bubulcus ibis	Cattle Egret	NN	0.5
PASSERIFORMES			
PYCNONOTIDAE			
Pycnonotus cafer	Red-vented Bulbul	NN	4
Pycnonotus jocosus	Red-whiskered Bulbul	NN	2,5
ZOSTEROPIDAE			
Zosterops japonicus	Warbling White-eye	NN	5
MUSCICAPIDAE			
Copsychus malabaricus	White-rumped Shama	NN	0.5
STURNIDAE			
Acridotheres tristis	Common Myna	NN	11.5
CARDINALIDAE			
Cardinalis cardinalis	Northern Cardinal	NN	0.5
THRAUPIDAE			
Paroaria coronata	Red-crested Cardinal	NN	1.5
Sicalis flaveola	Saffron Finch	NN	†
FRINGILLIDAE			
Haemorhous mexicanus	House Finch	NN	0.5
PASSERIDAE			
Passer domesticus	House Sparrow	NN	4

Table 2 (continued).

ORDER FAMILY *Species*	**Common Name**	**Status**	**Relative Abundance**
ESTRILDIDAE			
Estrilda astrild	Common Waxbill	NN	15
Amandava amandava	Red Avadavat	NN	†

† = Incidental observation; observed outside the timed count.

Key to Table2.

Status:
IM = Indigenous, migratory species.
NN = Naturalized, non-native species (introduced).
Relative Abundance: Species count / number of point-count stations (n=2).

Mammals

Only tracks and a sighting of domestic cat (*Felis catus*) were noted around the Project site. The findings of the mammalian survey are consistent with the location of the Project in an industrial setting.

Discussion and Recommendations

Recommendations are partly based on U.S. Fish and Wildlife Service, Animal Avoidance and Minimization Measures (USFWS-PIFWO, nd). Implementation of the recommendations (provided below as bulleted items) by the Project contractor will minimize impacts to protected species and other natural resources of concern to the maximum extent practicable.

Floral Resources

No species of plants of conservation concern or enjoying statutory protection (that is, listed as threatened or endangered; HDLNR, 1998; USFWS, 2020a) were noted present on the site in our survey.

Invertebrates

Yellow-faced bee are listed as endangered in the Hawaiian Islands (USFWS, 2016), and six of seven species of yellow-faced bee are known to occur on Oʻahu

(*Hylaeus anthracinus*, *H. assimulans*, *H. facilis*, *H. kuakea, H. longiceps,* and *H. mana*) in montane and coastal habitat. No yellow-faced bee species was observed during our survey and the Project site lacks habitat for these insects. Likewise, the site lacks habitat for endangered native damselflies.

Avian Resources

Waterbirds

Waterbird species protected under state and federal endangered species statutes on Oʻahu are: Hawaiian Coot or *ʻalae keʻokeʻo* (*Fulica alai*), Hawaiian Common Gallinule or *ʻalae ʻula* (*Gallinula galeata sandvicensis*), and the Hawaiian endemic sub-species of the Black-necked Stilt or *aeʻo* (*Himantopus mexicanus knudseni*). On Oʻahu, the population of Hawaiian Duck or *kōloa* (*Anas wyvilliana*) has interbred extensively with the non-native feral Mallard (*A. platyrynchos*), such that Hawaiian Duck-Mallard hybrid of the two species are predominantly observed and are difficult to distinguish from pure *kōloa* (Uyehara et al., 2007). The Hawaiian Duck-Mallard hybrid is not protected.

No waterbird habitat occurs within the Project area. Nearby (across Kawailoa Drive) occurs extensive open water of ʻUkoʻa Pond, which might harbor *ʻalae keʻokeʻo*, *ʻalae ʻula*, and *kōloa*. This part of the pond appears not to be conducive to use by *aeʻo*, but this stilt could be attracted to any flooded ground on the site following heavy rains. Although very unlikely that these species would wander onto the Transfer Station, the following precaution must be observed.

- Should an endangered waterbird appear on the Project site during construction, work in that area must cease until the animal leaves voluntarily.

Seabirds

Nocturnally-flying seabirds may become disoriented by exterior lighting and collide with man-made structures or the ground. If not killed outright, dazed or injured birds are easy targets of opportunity for feral mammals (Podolsky et al., 1998; Ainley et al., 2001; Day et al., 2003). In Hawaiʻi, night-flying seabirds include Hawaiian Petrel (*Pterodroma sandwichensis*), Wedge-tailed Shearwater (*Ardenna pacifica*), Newell's Shearwater (*Puffinus newelli*), and Band-rumped Storm-petrel (*Oceanodroma castro*). Hawaiian Petrel, Newell's Shearwater, and Band-rumped Storm-petrel nest in upland mountainous habitat and a population of Newell's Shearwater has recently been detected on Oʻahu (Young et al., 2019). Nocturnally-flying seabirds are at-risk of disorientation when birds (particularly fledglings) transit between the sea and inland locations

during night and early morning hours. The primary cause of mortality in both Hawaiian Petrel and Newell's Shearwater is predation by alien mammalian species at the nesting colonies (USFWS, 1983; Ainley et al., 2001). Collision with man-made structures is considered the second most significant cause of mortality of these seabirds in Hawaiʻi. No suitable nesting habitat for seabird species occurs in the Project area.

- Deleterious impacts to transiting seabirds can be avoided if construction occurs during daylight hours and all outdoor lighting installed is fully "dark sky compliant" (HDLNR-DOFAW, 2016).

Owls

The Hawaiian endemic sub-species of Short-eared Owl or *pueo* (*Asio flammeus sandwichensis*) is state-listed as endangered on Oʻahu only. Short-eared Owl nest on the ground and are thus susceptible to mammalian predation. The species is increasingly scarce on Oʻahu, but has been observed in the general vicinity (Luke, personal observation; Cotin & Price, 2018). No evidence of Short-eared Owl was found in our survey. The disturbed industrial habitat available at the Project site has no potential to support this species, although on occasion owls may hunt rodents attracted to the Project site.

Mammalian Resources

Our survey identified only one mammal: domestic cat (*Felis catus*), although it is probable that small Indian mongoose (*Herpestes javanicus*) and one or more alien Muridae species (rats and mice) utilize the Project area to some extent. The aforementioned mammalian species are introduced mammals deleterious to native ecosystems.

It is likely that the endemic Hawaiian hoary bat or *ʻōpeʻapeʻa* (*Lasiurus cinereus semotus*) uses resources within the Project vicinity (for example, this species is known from a nearby windfarm site; SWCA, 2011a, b). Hawaiian hoary bat is a solitary species and potentially widespread throughout the Main Hawaiian Islands (Bonaccorso, et al., 2015). Only a few tall trees suitable for roosting occur on the property.

- To avoid potential deleterious impacts to roosting bats with pups, it is recommended that no woody vegetation taller than 4.6 m (15 ft) be removed during the bat pupping season between June 1 and September 15 (USFWS-PIFWO, nd.). The use of barbed wire to top fence lines may entangle flying bats and is to be avoided (Zimpfer and Bonaccorso, 2010).

Other Resources of Potential Concern

Critical Habitat

No federally designated Critical Habitat occurs in the Project vicinity (USFWS (2020b). No equivalent statute exists under state law.

Jurisdictional Waters

No jurisdictional waters are present on the Project site. Nearby 'Uko'a Pond (across Kawailoa Drive) is probably the nearest jurisdictional water, but will not be impacted by the proposed improvements to the transfer station.

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Appendix B

Cultural Impact Assessment

FINAL—Cultural Impact Assessment for the Kawailoa Transfer Station Improvements Project in Kawailoa Ahupuaʻa, Waialua District, Island of Oʻahu, Hawaiʻi

TMK: (1) 6-1-005:018 (por.)

Prepared For:
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March 2021

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MANAGEMENT SUMMARY

A cultural impact assessment (CIA) was conducted for a portion of TMK: (1) 6-1-005:018 in Kawailoa Ahupuaʻa, Waialua District on the Island of Oʻahu, Hawaiʻi, where the City and County of Honolulu is planning to make improvements to the existing Kawailoa Transfer Station. The CIA took the form of background research and an ethnographic survey consisting of interviews with three people knowledgeable about the area.

The background research synthesizes traditional and historic accounts and land use history for the Waialua District and Kawailoa Ahupuaʻa. Consultations with community members were conducted to obtain information about the cultural significance of the subject property and of Kawailoa as a whole, as well as to address concerns of the community regarding the effects of the proposed project on places of cultural or traditional importance.

The background study revealed that the Waialua District was a land rich in natural and cultural resources. Two prominent freshwater fishponds are located near the project area and associated with traditional lore. The district was also able to support sweet potato cultivation, which supplemented the marine-based diet. Archival documents note many traditional sites in the vicinity of the project area, such as heiau, a kahuna residence, fishponds, a healing stone, and an area where the dead were lain. Waialua was also known as the home of the Poʻe Lō Aliʻi, a special class of royalty that was sought after for strategic marital alliances or when an aliʻi nui was needed.

Interviews with individuals knowledgeable about the Kawailoa area produced information about the cultural significance there. The interviewees mentioned nearby cultural sites such as those at Puaʻena Point in Haleiwa, a nearby heiau, a fishing village, a cemetery, the former Kawailoa Camp, a historic sugarcane pump, a rock wall, a rock mound, and ʻUkoʻa and Lokoea Fishponds. One interviewee mentioned that his grandfather collected traditional artifacts such as a poi board, poi pounder, ʻulu maika, and moa paheʻe. The gathering of prawns, fish, and bulrushes at ʻUkoʻa Pond were also noted. Overall, the three interviewees are supportive of the proposed improvements to the Kawailoa Transfer Station if proper measures are taken.

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INTRODUCTION

At the request of Element Environmental, LLC, on behalf of the City and County of Honolulu, Keala Pono Archaeological Consulting conducted a cultural impact assessment (CIA) for a portion of TMK: (1) 6-1-005:018 in Kawailoa Ahupuaʻa, Waialua District on the Island of Oʻahu, Hawaiʻi. The City and County of Honolulu is planning to expand and improve the current transfer station to handle the collection and storage of green waste for recycling.

The report begins with a description of the project area and a historical overview of land use and archaeology in the area. The next section presents methods and results of the ethnographic survey. Project results are summarized and recommendations are made in the final section. Hawaiian words, flora and fauna, and technical terms are defined in a glossary. At the end of the report are appendices with documents relevant to the ethnographic survey including full transcripts of the interviews.

Project Location and Environment

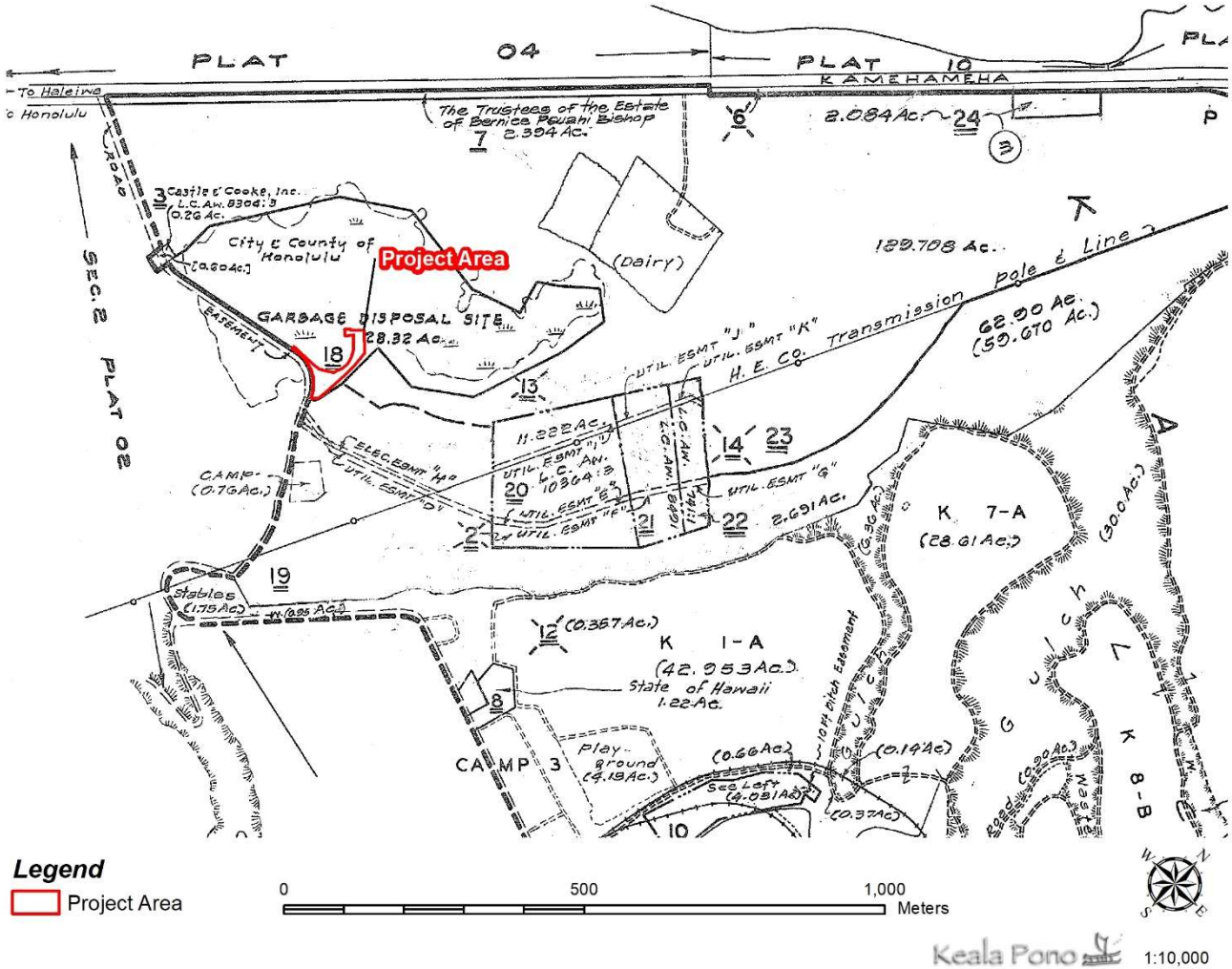
The project area is located in Kawailoa Ahupuaʻa, Waialua District, on the island of Oʻahu (Figure 1). The project area encompasses approximately 0.79 acres (0.32 ha) of TMK: (1) 6-1-005:018, located ma uka of Kamehameha Highway on the North Shore (Figures 2 and 3). The subject property is owned by the City and County of Honolulu and is bounded on the south by Kawailoa Drive, on the west by the existing landfill, and on the north and east by undeveloped land. The site is located within a current transfer station, adjacent to a small, closed landfill. This area was used for discarding unwanted bulk items in the 1950s and turned into an informal "swapping area" of used goods. In the 1960s, the site became a landfill and by the mid-1980s, the landfill was closed down and converted into the current transfer station. The project area is located within the Special Management Area.

The parcel sits approximately .76 km (0.5 mi.) from the coast. Rainfall averages 90.5 cm (35.6 in.) per year with April to September being the driest months and November to January receiving the most rainfall (Giambelluca et al. 2013). January is the wettest month and receives 12.6 cm (5.0 in.). Anahulu River is the largest permanent watercourse in the area, located approximately 1.6 km (1 m.) south of the property. Another body of water is ʻUkoʻa Pond and the surrounding swampland, which lies directly across of Kawailoa Drive from the project. The project area's location relative to Anahulu River and the ʻUkoʻa Pond suggests that this area would be important to the settlement of the region. This will be discussed further in the background section of this report.

Topography of the parcel is flat with little vegetation due to development of the existing transfer station. The transfer station is currently mostly paved, with gravel and dirt roads. Clumps of short grass are scattered throughout, along with predominantly non-native trees along the periphery of the lot. Generally, soils in the area are of the Waialua Association, specifically Waialua stony silty clay, 3–8% slopes (WIB) and coral outcrop (CR) (Figure 4). These are described by Foote et al. (1972:29,128) as follows:

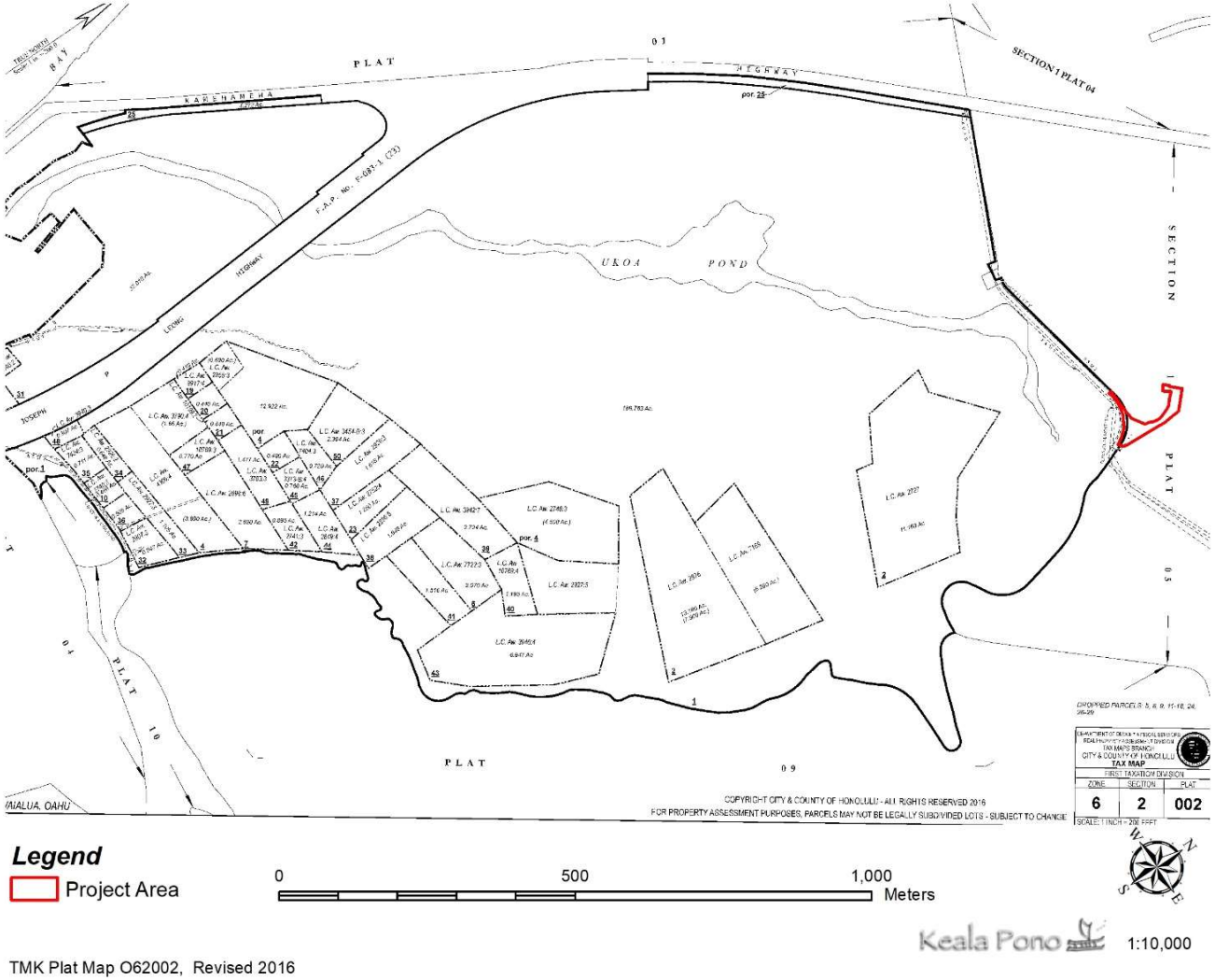
> Waialua Stony Silty Clay, 3–8% slopes (WIB)
>
> This soil has a profile like that of Waialua silty clay, 0–3% slopes, except that there are sufficient stones to hinder tillage but not enough to make intertilled crops impractical. Runoff is slow, and the erosion hazard is slight. Workability is slightly difficult…This soil is used for sugarcane, truck crops, orchards, and pasture.
>
> Coral outcrop (CR)
>
> Coral outcrop (CR) consists of coral or cemented calcareous sand on the island of Oahu. The coral reefs formed in shallow ocean water during the time the ocean stand was at a

Figure 1. Project area on a 7.5 minute USGS Haleiwa quadrangle map (USGS 1999).



TMK Plat Map O61005, Date 1951 Revised

Figure 2. Project area on a portion of a 1951 TMK plat map.



TMK Plat Map O62002, Revised 2016

Figure 3. Project area on a 2016 TMK plat map.

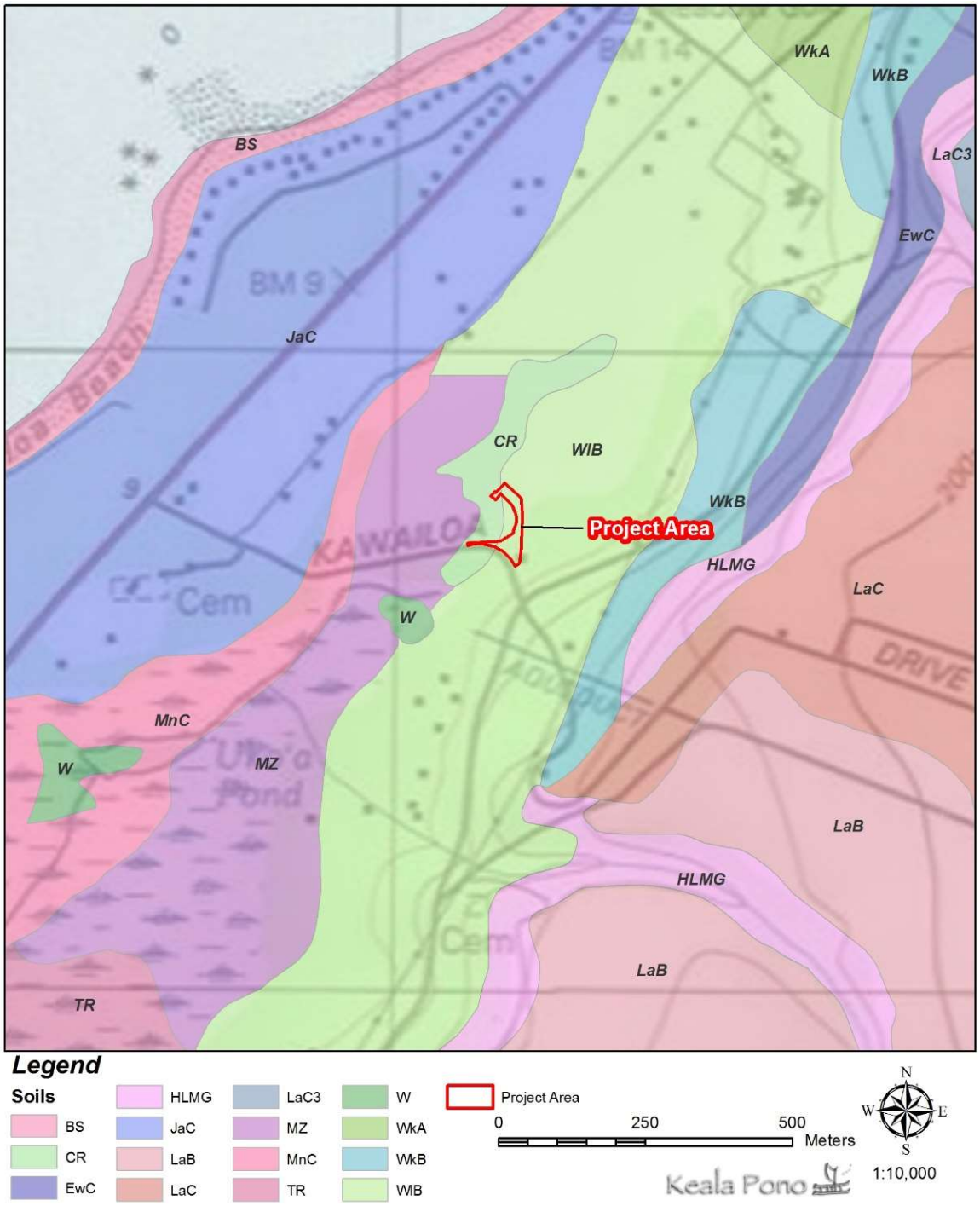


Figure 4. Soils in the vicinity of the project area (data from Foote et al. 1972).

> higher level. Small areas of coral outcrop are exposed on the ocean shore, on the coastal plains, and at the foot of the uplands…This land type is used for military installations, quarries, and urban development.

Additional soils near the project area consist of Ewa stony silty clay, 6–12% slopes (EwC); Helemano silty clay, 30–90% slopes (HLMG); Lahaina silty clay, 3–7% slopes (LaB); Lahaina silty clay, 7–15% slopes (LaC); Lahaina silty clay, 7–15% slopes, severely eroded (LaC3); Mamala stony silty clay loam, 0–12% slopes (MnC); tropaquepts (TR); Waialua silty clay, 0–3% slopes (WkA); and Waialua silty clay, 3–8% slopes (WkB). There are also beaches (BS) along the shore and Jaucas sand, 0–15% slopes (JaC) just inland from the shore at the coastal plain. A large region west and southwest of the project area encompassing ‘Uko‘a Pond is marsh (MZ) and there are two small portions of water (W) (see Figure 4).

The Project

The Kawailoa Transfer Station Improvements Project will consist of expanding the facilities to handle the collection and storage of green waste for recycling. The proposed project will include the construction of a second load-out and a permanent office with a restroom including a holding tank. The second load-out area will make the facility similar to other transfer stations, allowing for operational flexibility and reliability. All improvements will be within the limits of already developed areas and will require roughly 28,000 square feet for collection, transfer, parking, circulation, storage, and operations. Construction will include vegetation clearing, minor grading and excavation, and paving.

The primary customers for the proposed facility are collection trucks from the City’s Lā‘ie and Waialua Refuse Collection Yards, as well as residential self-haulers. Currently, green waste is not accepted for recycling and these loads are sent to H-POWER along with the rest of the refuse. The nearest green waste composting facility is located nine miles away, so upgrading the Kawailoa Transfer Station facilities will reduce the distance residential haulers need to travel for green waste recycling.

BACKGROUND

This section of the report presents background information as a means to provide a context through which one can examine the cultural and historical significance of the ahupuaʻa of Kawailoa and greater Waialua District. In the attempt to record and preserve both the tangible (e.g., traditional and historic archaeological sites) and intangible (e.g., moʻolelo, ʻōlelo noʻeau, place names) culture, this research assists in the discussion of anticipated finds. Research was conducted at the Hawaiʻi State Archives, Hawaiʻi State Library, the SHPD library, and online on the Papakilo database, Waihona ʻAina database, and the State of Hawaiʻi Department of Accounting and General Services (DAGS) website. Historical maps, archaeological reports, and historical reference books were among the materials examined.

Waialua and Kawailoa in the Pre-Contact Era

Information compiled for the pre-contact era (before the arrival of Westerners to Hawaiʻi in 1778) includes data on place names, land use, and subsistence, as well as several moʻolelo, ʻōlelo noʻeau, and oli. Together, they give us an idea of what life may have been like in this storied place.

Place Names

There are other means, besides archival documentation, by which Hawaiʻi's history has been preserved. One often overlooked source of history is the information embedded in the Hawaiian landscape. Hawaiian place names "usually have understandable meanings, and the stories illustrating many of the place names are well known and appreciated… The place names provide a living and largely intelligible history" (Pukui et al. 1974:xii). Place names often shed light on traditional views of an area and can provide important contextual information.

Several conflicting accounts inform on the naming of Waialua District. Thrum (in Sterling and Summers 1978:88) states that "Waialua" translates to "two waters," thus many believe that the name derived from Waialua's two streams. However, he believes that the district was named after a taro patch, and a common saying was that if you traveled to Waialua and did not see this taro patch, then you did not really see Waialua. Pukui (in Sterling and Summers 1978:88) asserts that the district was named for the cruel chief Waia, grandson of Wākea. Waia carried out his evil deeds at Waialua, and there was so much suffering there that the district was named Waialua, or "doubly disgraceful." Another source attributes the name to Waialua Pool at Kemoʻo (Awai in Sterling and Summers 1978:88).

Kawailoa translates to "the long water," which is adapted to the character of the ahupuaʻa, where the long watercourse, the Anahulu River, flows (Pukui et al. 1976:98). In addition to the land division in Waialua, there is a place of the same name in east Oʻahu, and there are bays named Kawailoa in Līhuʻe, Kauaʻi and in northwest Molokaʻi. Anahulu River is a major watercourse of the region and its name translates to "ten days" (Pukui et al. 1976:12).

The current project area and the places around it are listed in *Place Names of Hawaii* along with the meanings of their names and/or other comments about the specific locales (Pukui et al. 1974:12, 37, 44, 67, 98, 128, 133, 181, 185, 190, 214, 220):

> Anahulu…Stream, Waiʻalua, Oʻahu…*Lit*., ten days.
>
> Haleʻiwa… Town, elementary school, beach park, surfing beach…*Lit*., house [of] frigate bird (ʻiwa birds were admired for their beauty).

Helemano… Stream, elementary school, reservoir, ditch, and campus, Wahiawā and Haleʻiwa qds., Oʻahu…*Lit*., many snared or many going.

Kaiaka… Point and bay, Haleʻiwa qd., Oʻahu, said to be named for a person…*Lit*., shadowed sea.

Kawailoa… Hill (610 feet high), beach, village, camps, ranch house, station, Haleʻiwa qd., Oʻahu…*Lit*., the long water.

Laniākea…Surfing area, Haleʻiwa qd., Oʻahu…famous for long "right-side" rides and named for nearby residence…*Lit*., wide sky.

Lokoea…Old fishponds near Waialua and Waipahu, Oʻahu…*Lit*., rising pond.

Paukauila…Land section, Haleʻiwa, Oʻahu…*Lit.,* the lightning ceases.

Poamoho…Stream, trail and camp, Wahiawa, Oʻahu.

Puaʻena…Point and ancient surfing area, Waialua Bay, Oʻahu…*Lit*., issue hot. (Pele lived at Waialua Bay before going to Hawaiʻi)

ʻUkoʻa…Fishpond, Waialua, Oʻahu; believed inhabited by Lani-wahine, a moʻo, for whom offerings were left; she swam to the sea through a tunnel. Strange fish were sometimes found here-part mullet and part weke, or mullet on one side and kūmū on the other. When the fish were scaled, the colors were found to be deeply embedded. Unpredictably the fish might be fat or thin and hardheaded.

Waialua…Mill, town, railroad, bay, beach park, recreation center, district, golf course, reservoir, and elementary and high schools, Haleʻiwa qd., northwest Oʻahu.

Land Use and Subsistence

The greater district of Waialua, of which Kawailoa is a part had been a district of royal lands and royal fishponds and is a region rich in natural and cultural resources. Since the time of initial settlement, it had been a prime location due to its marine resources, easy access to fresh water, and the abundance of its agricultural capabilities. The district was also able to support sweet potato cultivation, which supplemented the marine-based diet. Kawailoa supported two fishponds, Lokoea near today's Haleiwa town and the larger ʻUkoʻa Fishpond, located just southwest of the project area. All of these aspects have made the region particularly valuable throughout the centuries.

Terraced areas were located all along the Anahulu River, in Anahulu Gulch, and in the swamps east of Puaʻena Point (Handy 1940). Handy provides more detail on the agricultural locales in Kawailoa:

> In Anahulu Gulch small flats with old mango trees, indicating kuleana, were observed several miles inland, and I am told that small areas were cultivated far up the gulch. Wild taros were seen in the side gulch at least 5 miles inland. The dry gulches between Anahulu and Waimea Streams probably never watered taro. (Handy 1940:86)

Handy and Handy also note the agricultural abundance of the land:

> Waialua, on its seaward slopes, was as generously endowed with water as any area on Oahu. Much of the gently sloping and level land was formerly covered with wet-taro terraces. And beyond there was a great spread of *kula* land with red soil which was ideal terrain for sweet potato planting. The Waiʻanae range gave this area a rich hinterland.

> Waialua had a fine bay with a broad beach, and there were several fishponds...Altogether this was the most bounteously endowed area on the sunset coast.
>
> Two large fishponds were among Waialua's greatest assets. Ukoa was a long, narrow fresh-water pond about a mile in length. Laniwai (Sky-water) was its *moʻo* guardian. With her lived her brother, Puhi-ʻula (Red-eel). The pond was said to be connected with the ocean by a tunnel, through which the *moʻo* would go to bathe in the sea…Another pond named Lokoea is mentioned elsewhere…(Handy et al. 1972:465–6)

ʻUkoʻa and Lokoea were prominent fishponds in Kawailoa, connected to one another and fed by springs. Both ponds were once used to raise fish such as ʻanae and awa. In a comprehensive study of the Anahulu Valley, Kirch and Sahlins emphasize the prominence of the region in traditional times and mention the two major ponds:

> The presence of no less than eleven temples, several of *luakini* class and therefore associated with ruling chiefs, testifies to the importance of these lands to the Hawaiian chiefs. The political importance of the district, of course, was grounded in the system of agricultural and aquacultural production, notably the extensive taro irrigation complexes and ʻUkoʻa and Lokoea fishponds. (Kirch and Sahlins 1992:19)

A recent survey of Lokoea Fishpond describes it as a puʻuone (a pond near the coast) that consists of seven archaeological features, including rock walls, a central island, and caves (Monahan and Thurman 2015:57, 163). The historical importance of Lokoea and ʻUkoʻa is summarized as follows:

> Oral-historical information about Lokoea and ʻUkoʻa describe their elevated status as royal fishponds. Kamakau (and other accounts including Hawaiian language newspapers) described these fishponds as the "long house" of its famous moʻo (supernatural water spirit), Laniwahine (Kamakau 1991:84), where she lived with her brother, Puhiʻula. There is a fairly extensive record of moʻolelo about Laniwahine, who is variously described as a shark or a shark god, a moʻo akua and kiaʻi (guardian), and/or a woman. We believe the name of Lokoea and ʻUkoʻa's ahupuaʻa, Ka-wai-loa, literally "the long water," may refer to these two famous fishponds. ʻĪʻī (1959:98) stated there were "many homes about . . . the ponds of Ukoa and Lokoea," and that the main coastal trail passed closely to the "sluice gate of Lokoea." (Monahan and Thurman 2015:163)

The Hawaiian historian John Papa ʻĪʻī wrote of a traditional trail that traversed through Waialua, coming from the Kaʻena side and onward to the Anahulu Stream, then up into Oʻahu's central Wahiawā area to meet with the Waiʻanae Uka Kolekole Trail, and finally looping around to connect back towards Waialua. He described the natural and built landscape, and places in Kawaihāpai, Mokulēʻia, Paʻalaʻa, and Kamananui are specifically mentioned:

> The trail led to Kaʻena and all the way to Waialua… When travelers arrived in Kaʻena in the morning, they escaped the heat, for they were cooled by the Moae Breeze. They rested at Waiakaaiea [in Kawaihapai] until afternoon, then continued traveling along the level places of Kawaihapai and Mokuleia, thence across the mouth of Kaiaka River and over the sand to the plains of Paalaa and Kawailoa to Kamani, a village with a pond, the boundary walls of which separated it from the Anahulu River.
>
> From the stream of Anahulu and from Kamani, above the houses and taro patches, a trail stretched along in front of Kuokoa's house lot and the church. This trail went on to meet the creeks of Opaeula and Halemano, the sources of the stream of Paalaa, on down to the stream of Poo a Moho, and on to the junction where the Mokuleia trail branched off to Kamananui and Keawawahie, to Kukaniloko, the birthplace of chiefs. Just below the main trail was the descent to the stream of Kuaikua, where there was a diving place and a place for travelers to rest. Beyond was Paka stream and the maika field of Kapalauauai, which

> lay beyond the pond belonging to the village. There the trail met with the one from Kolekole and continued on to the stream of Waikakalaua, Piliamoo, the plain of Punaluu, to a rise, then down to Kipapa and to Kehualele. A trail ran from this main trail to Kalakoa, Oahuui, and other places much visited, such as Kukaniloko. From there it extended to the digging place of Kahalo then went below to Paupalai, thence to Lelepua, and to Kahalepoai, where the legendary characters Kalelealuaka and Keinohoomanawanui lived. Then it went on to Puunahawele and Pueohulunui, where it met with the Waialua trail.
>
> All of these places mentioned had large populations. The land was rich, and there were many trees in olden times. (ʻĪʻī 1959:98–99)

As a whole, the Waialua region was fruitful with sandalwood and koa forested interiors; well-watered lands fertile with agriculture; and an abundance of marine resources. The ma kai areas once contained many loʻi, while the ma uka slopes were covered with kula of red soil, an environment very good for growing sweet potato (Handy et al. 1991:466; Kirch and Sahlins 1992:1:20). It has been noted that sweet potato was the staple in the drier regions of Oʻahu, one of which stretched from Kaʻena all the way to Lāʻie (Handy 1940:155).

The region was also associated with royalty. Chiefs of the Waialua Moku were given the rank of Lō, thus the chiefs of Līhuʻe, Wahiawā, and Helemano were called Poʻe Lō Aliʻi or "people from whom to obtain a chief" (Kamakau 1964:5). This specific rank was favored by other lines of aliʻi for strategic marital alliances or when an aliʻi nui was needed. One story regarding Waialua is retold in the moʻolelo section below, and speaks of one such royal marriage. The Poʻe Lō Aliʻi adhered to strict kapu and were said to dwell in the upland areas of Waialua.

> The men had kapus, and the women had kapus, and when they joined their kapus and children were born, the children preserved their kapus. They lived in the mountains (*i kuahiwi*); and if a kingdom was without a chief, there in the mountains could be found a high chief (*aliʻi nui*) for the kingdom. Or if a chief was without a wife, there one could be found – one from chiefly ancestors. Kauakaiʻailani, Maʻilikukahi, Kalona, Piliwale, Kukaniloko, Paʻakakanilea, Kaʻakauualani, Kaʻau, Lale, Paoakalani, Pakapakakuaua, Nononui, Kokolea, and a great many others were Lo chiefs. (Kamakau 1964:5)

Moʻolelo

The moʻo Laniwahine of ʻUkoʻa Pond is a noted figure in moʻolelo. It is said that she would appear in human form, and her presence would signal the coming of a terrible event (Kamakau in Sterling and Summers 1978). Kamakau and Manu both tell of the moʻo and the strange fish within her pond:

> Laniwahine was the guardian of Ukoʻa at Waialua, and Ukoʻa was regarded as the long house where she lived. She was a native of Ukoʻa and all her deeds centered about that place. The natives of Ukoʻa never failed to recognize her deeds, but few of her descendants are now left or perhaps none. Ukoʻa was a very strange fish pond in which lived extraordinary fishes. A fish might be a kumu fish on one side and on the other side a mullet; or on one side weke pueo and on the other mullet; or one side might be silver white like a white cock; when scaled the skin might be striped and variegated inside. It was clear to all her descendants that these strange fish belonged to Laniwahine and it was not right to eat them. But the mullet of Ukoʻa were full of fat, when as in all such ponds, the native guardian of the pond was remembered; (at other times) the fish had thin bodies and heads like wood or sometimes disappeared altogether. (Kamakau in Sterling and Summers 1978:120)
>
> …Laniwahine was the royal lizard of Waialua and her residence was in the fresh water pond of Ukoʻa. This was the lizard mentioned in the chant of Kamehameha V, "Exposed are the teeth of Laniwahine, when the upper jaw and lower jaw separates." All kinds of

> strange mullet were seen swimming in the water, some red and some with one side differing from the other. The writer of this tale has seen it himself and perhaps the natives of the "land of sea sprays" will not deny it. Alamuki, Kamoʻoloa and Kamoʻo were lizards who served under Laniwahine. They lived where there were breezes. (Manu in Sterling and Summers 1978:10)

Another account identifies the home of Laniwahine as a hole at the head of the pond:

> Ukoa—land and fish pond in Waialua, Oahu. The latter is believed to have subterranean communication with the sea, as its waters are very much disturbed during stormy weather. There are superstitions and beliefs in connection with this famous pond. One gives rise to the common saying, "Pupuhi ka iʻa o Ukoa", "The fish of Ukoa is blown away or slipped off." There is a large circular hole at the head of the pond commonly credited as the home of Laniwahine, the sister of Puhiula, children of a goddess of ancient Hawaiian mythology. (*Saturday Press* in Sterling and Summers 1978:120)

In a conflicting account, Emerson states that Laniwahine was the name of a shark:

> Niu-kala, a shark god who formerly lived at Loko Ukoʻa in Waialua, Oahu, has left that place.
>
> Lani-wahine (Her highness) and Puhi-ula (Red eel), are two sharks associated together, and are now living at Ukoʻa, Waialua, Oahu (1888).
>
> …Lani-wahine (w) has been mentioned. Barenaba tells me it is the shark of Ukoʻa, Waialua, and that the name of her kahu is Kukiha and that she has a heiau called ___?___. (March 16, 1907). (Emerson in Sterling and Summers 1978:118)

Oral traditions also tell us that the Waialua District was the royal center of Oʻahu. Around AD 1490, the sacred chief Maʻilikūkahi was born at Kūkaniloko in Līhuʻe, which is located in the uplands of Waialua. Once his paramountship was installed at the heiau of Kapukapuakea in central Waialua, Maʻilikūkahi set up a land division and administration structure where Oʻahu was divided into the six moku of Kona, ʻEwa, Waiʻanae, Waialua, Koʻolauloa, and Koʻolaupoko. These moku were further divided into 86 ahupuaʻa. Maʻilikūkahi also shifted the royal center from Waialua to Waikīkī.

Another tale tying royalty to Waialua is that of Lo-Lale and Kelea (Kalākaua 1990). An aliʻi nui named Piliwale held court in Waialua and ordered that his brother, Lo-Lale strengthen their power through marriage. Due to his high rank, he searched beyond Oʻahu for a woman to be his wife. Kalamakua, his cousin was given the task of looking for a maiden. He did not find anyone on Molokaʻi, but decided to meet with the Maui King at Hamakuapoko. During his journey there, he met Kelea and soon discovered that she was the sister of the king. Kalamakua tricked her into going to Oʻahu, though once she met Lo-Lae, she agreed to the marriage. The wedding was held in Waialua and the "nuptials were celebrated with games, feasting, dancing and the commencement of a new heiau near Waialua, which was dedicated to Lono with a large image of Laamaomao…at the inner entrance, in poetic commemoration of the winds that drove Kelea away from the coast of Maui" (Kalākaua 1990: 240). Finally, a royal procession took Kelea to Līhuʻe in the uplands where the final celebrations took place over the course of several days. The couple had three children, though their marriage did not last. Kelea ended up later marrying Kalamakua and they had a daughter named Laielohelohe.

It is said that Puaʻena Point was a place where the dead were laid to decompose. Specifically noted was Elani, an Oʻahu aliʻi who was killed during the invasion of Maui's chief Kahekili in the 1700s:

> At the death of Elani, who was greatly beloved by his people, his body was placed on a ledge of rocks near Puaena Point, where it was allowed to decompose. The place became known as Kahakakau Kanaka. As the odor came to the sands at Haleiwa they became

> known as Maeaea; the point on the other side became known as Kupava. Hookala tells me that at this same place, if there was no one to care for the body of a commoner after his death, the corpse was placed on these rocks. The fluids from the decaying body would seep into the sea and attract sharks, which the people killed. (McAllister 1933:141–142)

Also slain during this time of upheaval was Huʻeu, an aliʻi who served under Kahekili. Huʻeu had been installed at Waialua and was living at Kaʻowakawaka in Kawailoa (Kamakau 1992). He was killed there at night while his guards were asleep.

ʻŌlelo Noʻeau

Traditional proverbs and wise sayings, known as ʻōlelo noʻeau, have been another means by which the history of Hawaiian places has been recorded. In 1983, Mary Kawena Pukui published a volume of close to 3,000 ʻōlelo noʻeau that she collected throughout the islands (Pukui 1983). Approximately 500 places are listed in the ʻōlelo noʻeau book along with the proverbs and wise sayings that refer to these specific places.

There are three ʻōlelo noʻeau in the compilation which refer to the district of Waialua as a whole. One of these suggests that Waialua is known to be a place of pleasant weather. Two of the Waialua ʻōlelo noʻeau refer to its mighty sea. The three Waialua sayings are recited here:

> **A nui mai ke kai o Waialua, moe pupuʻu o Kalena i Haleʻauʻau.**
> *When the sea is rough at Waialua, Kalena curls up to sleep in Haleʻauʻau.*
> Applied to a person who prefers to sleep instead of doing chores. A play on lena (lazy), in Kalena, who was a fisherman, and hale (house) in Haleʻauʻau. (Pukui 1983:16)
>
> **I Waialua ka poʻina a ke kai, o ka leo ka ʻEwa e hoʻolono nei.**
> *The dashing of waves is at Waialua, but the sound is being heard at ʻEwa.*
> Sounds of fighting in one locality are quickly heard in another. (Pukui 1983:137)
>
> **Waialua, ʻāina ku pālua i ka laʻi.**
> *Waialua, land that stands doubly becalmed.*
> Said in admiration for Waialua, where the weather was usually pleasant and the life of the people tranquil. (Pukui 1983:318)

A single ʻōlelo noʻeau was found referring to ʻUkoʻa Pond, and none were listed for Lokoea Fishpond or Kawailoa Ahupuaʻa.

> **Pupuhi ka iʻa Ukoʻa.**
> *The fish of Ukoʻa is gone.*
> Ukoʻa is a famous pond in Waialua, Oʻahu. Said of one who takes flight or of something quickly and secretly taken. (Pukui 1983:301)

Oli and Mele

The noteworthiness of specific locales in Hawaiian culture is further bolstered by their appearances in traditional chants. An oli refers to a chant that is done without any accompaniment of dance, while a mele refers to a chant that may or may not be accompanied by a dance. These expressions of folklore have not lost their merit in society today. They continue to be referred to in contemporary discussions of Hawaiian history, identity, and values.

In perhaps one of the greatest known sagas of Hawaiian oral traditions, the epic journey of Hiʻiaka, several chants commemorate her journey through the Waialua District. Upon arriving

at Waialua from the Koʻolau coast, she was moved by the great sound of Waialua's ocean. She chanted the following (Emerson 1997:99):

> O Waialua, kai leo nui;
> Ua lono ka uka o Lihuʻe;
> Kew a la Wahiawā, e.
> Kuli wale, kuli wale i ka leo;
> He loe no ke kai, e.

The translation is also provided in Emerson's text:

> Waialua, land of the sounding sea,
> With audience in upland Lihuʻe –
> A voice that reaches Wahiawā;
> Our ears are stunned by this voice –
> The voice, I say, of old Ocean!

Another chant titled, "Ke Kai o Waialua" speaks of various places within the ahupuaʻa and the roaring waves at Waialua Bay that are said to be heard all the way in Wahiawā (Pukui and Korn 1973:33):

> *A ea mai ke kai o Waialua*
> *Wawa no olelo okoa I pali,*
> *Nunu me he ihu o ka puaʻa hae la*
> *Ako ka lau o ka nalu pii ka pali,*
> *Ku pali Kaiaka i ka ino,*
> *ino ka lae o Kukuilauania,*
> *He Maka-nui*
> *Makani me he ao la ka leo o ke kai,*
> *Kuli paia wawa ka uka a Lihue*
> *Ome ha okaa i ke kula*
> *Ke kula hahi a ke kai e halulu nei*
> *Halulu ma ke Koolau*
> *Hoolono Ewa*
> *Aole i ike i ka po ana a ka nalu*
> *Kuhihewa wale no Waiawa-e.*
>
> Let the sea of Waialua rise,
> Let the roar echo over the hills,
> Rumble like the grunt of the wild pig.
> Let the rising wave break the leaf from the cliff.
> Kaiaka cliff stands above the storm,
> Stormy is the cape of Kukuilaania,
> Windy indeed it is.
> The voice of the sea rise upon the wind
> Deafening those in the uplands of Lihue,
> As it is born over the plain,
> The rumbling of the sea treading upon the plain,
> Rumbling over the Koolau.
> Ewa listens,
> She has not seen the rising of the waves
> And mistakes it for Wahiawa.

Waialua and Kawailoa in the Historic Period

The Waialua District boundary has a complicated history (Sterling and Summers 1978:134). At the turn of the 20th century, Wahiawā Ahupuaʻa fell within the Waialua District. By 1913, the community had grown apart from Waialua District, and the new district of Wahiawā was established. Thus, in 1913, the ahupuaʻa of Wahiawā and Waiʻanae Uka were moved from Waialua District to the new district of Wahiawā. In 1925 the size of Waialua District was reduced, as large plots of land were transferred to Wahiawā. However, in 1932 the original 1913 land boundaries were reinstated, with some small parcels added to the Schofield Barracks Military Reservation.

Major changes took place in the post-1778 historic era, as foreign interests began to take hold. Sugarcane, pineapple, and the U.S. military were the key enterprises that shaped the region later in time. The following data add to our knowledge of historic Waialua and Kawailoa. They include an early description by Captain Charles Clerke, several translated Hawaiian language newspaper articles, historic maps and aerial photos of the region, and Māhele data.

Early Descriptions of Kawailoa

One of the first written descriptions of Oʻahu's North Shore comes from Captain Charles Clerke, who sailed to Waimea after the death of Captain James Cook in 1779. Clerke anchored in Waimea Bay and described his surroundings:

> I stood into a Bay just to the Wt[est]ward of this point the Eastern Shore of which was by far the most beautiful Country we have yet seen among these Isles, here was a fine expanse of Low Land bounteously cloath'd with Verdure, on which were situate many large Villages and extensive plantations; at the Water side it terminated in a fine sloping, sand Beach. . . . This Bay, its Geographical situation consider'd is by no means a bad Roadsted, being sheltered from the NEbN SEterly to SWbW with a good depth of Water and a fine firm sandy Bottom; it lays on the NW side of this Island of Wouahoo . . . surrounded by a fine pleasant fertile Country. (Beaglehole 1967:569)

A multitude of Hawaiian Language newspaper articles were found that mention Kawailoa. The small collection of articles presented here provide interesting information and afford a rare glimpse of what life was like in historic-era Kawailoa. They speak of schools, problems with drunk and unruly residents, a Sunday school exhibition, a visit to Lokoea Fishpond by Queen Emma, the presence of spirits in the river, and the arrival of a fleet of canoes. These first person accounts from Hawaiian language newspapers offers priceless insights into the land use and the lifestyle of the residents which would otherwise be missing in the textual summary of the project area. The articles were translated by Keala Pono senior staff members Dietrix Duhaylonsod, BA and Manuwai Peters, EdD. They are presented below in chronological order.

Ka Nonanona: KA NONANONA. BUKE 1, PEPA 13, AOAO 49. DEKEMABA 21, 1841. *(21 December 1841)*: page 51

> NA KULA MA WAIALUA.
> Waialua, Nov. 3, 1841.
> Aloha oe Ii.
>
> Ua pau na hoike ma Waialua nei a ma Koolau i ka malamaia. A eia malalo iho nei na inoa o na kumu, ka nui o ka lakou mau haumana a me ko lakou ike a me ka uku pono i kuu manao e uku aku ia lakou no ka manawa i hala iho nei, a o ka uku hoi no ka manawa hou.
>
> Kawailoa a me Paala, o Kaiaikawaha Kealohanui na kumu.

Na haumana a pau loa, 139
Keikikane, 91
Kaikamahine, 48
O ka nui ma ka hoohalike ana i na la, 113
Ma ka A, 35
Ka poe ike, 104
Ike palapala lima, 56
Ike i ka olelo honua, 32
Helu kamalii, 60
Helu naau, 34
Ake akamai, 36
O ka poe hou i ike i ka heluhelu, 12.

THE SCHOOLS AT WAIALUA
Waialua, Nov 3, 1841
Aloha to you Ii.

The [school] tests here in Waialua and Koolau are finished and have been tended to. Here below are the names of the teachers, the number of their students and their subject with the rightful tuition in my mind that they will pay for this past term and the tuition for the new term.

Kawailoa and Paala, Kaiaikawaha Kealohanui are the teachers.

The students' total, 139
Boys, 91
Girls, 48
The amount in comparing the days, 113
A grade, 35
Proficient students, 104
Writing, 56
Geography, 32
Beginner's math, 60
Upper-level math, 34
Science, 36
New people who have learned reading, 12

Ka Hae Hawaii: KA HAE HAWAII. Buke 6, Ano Hou.--Helu 27, Aoao 105. Okatoba 2, 1861. *(2 October 1861)*: page 106

"Ua mau ka ea o ka Aina i ka pono."

Ma ka ulu mahiehie o ko'u manao iloko o'u. He pono no au ke hai aku, i ike mai oʻu hoa puni Nu Hou. Ma ka la 19 o Sepatemaba, aia he aha inu rama nui mauka o Kawailoa, ma kahi o Hinana, (ka mea i holo i Ulukaa mamua,) nui na mea i hele aku ilaila, malaila hoi kekahi mau kanaka o Kahalau a me Kaina, ua loohia lakou e ka ona, a ua kui ia ka maka o Kahalau e Kaina, a eha no, ua piha loa ia o Kahalau i ka huhu luaole imua ona ia la, a ua kui ia o Kaina, a ua hina, a ua hehi ia ma kona lemu, a ua pau i ka uao ia e na hoa inu rama a ua kaawale o Kaina mai ke alo aku o Kahalau, a mahope iho, ua hoea hou mai o Kaina, ka enemi lua ole o Kahalau ia la, ua hele aku oia a halawai me Kaina, (ua olelo ia ua aloha aku o Kahalau ia Kaina, a ua hoole mai o Kaina,) ia manawa, ua hehi ia o Kaina ma ka ai e Kahalau, a ua kui ia; Ia manawa, ua kaili ke aho o Kaina i kona wa o ka aneane e komo iloko o ka make hikiwawe iloko o kona lealea ana i ka ona o ka rama, ua oleleia, he nui ka ikaika o Kahalau ia wa, ua makau no ka lehulehu. Ia wa, aia o Kaina e waiho ana iloko o

ka pilikia, aia hoi na mea a pau e loku ana iloko o ka ona o ka rama, ua holo koke o Kamokumaia, i kahi o ka

Lunakanawai e kii ia e hopu o Kahalau ka mea i pepehi ia Kaina, ia wa, ua hiki pu mai no o Kahalau ka mea i pepehi ia Kaina i kahi o ka Lunakanawai, aia ua hopu koke ia oia, ua hoounaia 3 makai e ike i ke kino eha o Kaina ka mea i pepehi ia e Kahalau, ma ka la 20 ae ua hoopii ia o Kahalau ka mea i pepehi ia Kaina imua o J. W. Keawehunahala ka Lunakanawai Apana no ka haki ana o Mokuna IX Pauku 6-8 o ke Kanawai hoopai "Karaima" ia Kahalau, na ka Ahahookolokolo e noonoo ma ka olelo ike a na hoike ka pili ana o na pauku i hoopii ia e ke 'Lii no Kahalau no ka hewa i hanaia eia. Aia ua hiki mai ke kino eha o Kaina ia la imua o ka aha hookolokolo i hoike no ka aoao o ke alii, elua hoi kanaka e ae ma ka aoao i hoopiiia. Ua waiho ia keia hihia na ke jure e hookolokolo hou.

Ma la 21, ua lawe ia o Kahalau ma ka lima o ka Ilamuku, e paa ai a hiki mai ke kau hookolokolo jure o Okatoba 7, 1861, ma ka la 22, ua hiki mai o J. H. Brown Esy ka Makai Nui me Dr Ford e nana i ke kino o Kaina i ka mea i eha i Kahalau.

Ma ka wanaao o ka la 23, ua make loa o Kaina, ua kii hou ia ka Makai Nui me Dr Kauka e hele mai, ma ka la 25, ua hiki mai o John H. Brown Esy me ke Kauka pu, ia wa, ua kahea koke ia ke Karonero e hele e noonoo i ke kumu o ko Kaina make ana. Eia na Karonero J. Hanaloa, J. B. Makea, J. Amara, J. P. Kauwalu, J. A. Kawi, J. Hakuaulani, ma ka hora 10, A. M. ua hoomakaia ka niele ana i na hoike imua o J. W. Keawehunahala ke Karonero me na jure eono i hoikeia maluna, me ka Makai nui o ka Mokupuni Oahu, J. H. Brown Esy a ua pau i ka noonoo ia ka olelo a na hoike. O ke nui o ka lakou olelo hooholo, “Ua make o Kaina ia Kahalau i kona kui ana me kona hehi ana ma ka la 18 o Sepatemaba,” i olelo mua ia maluna, na ka Ahahookolokolo e noonoo.

Eia hoi, ua hoopaiia o Hianana ka mea i olelo mua ia maluna no kona hana ana i ka wai ona a haawi wale aku i na dala 100. No ka haki ana o ka Mokuna XLII Pau 1 o ke Kanawai hoopai i na hewa karaima o keia Aupuni, Ua maopopo, o ka ona ke kumu o keia make. J. P. KAUWALU.
Waialua, Oahu, Sepatemaba 26, 1861.

“The life of the Land is perpetuated in righteousness”

At the pleasing inspiration of my thoughts inside of me. It is necessary for me, the one who tells, that my friends who love news have known.

On September 19, what of the great alcohol drinking upland of Kawailoa, instead of Hinana (the one who sailed to Ulukaa beforehand), many were those who went there, at that place were some people of Kahalau and Kaina, they were overwhelmed by drunkenness, and Kahalau’s eye was punched by Kaina, and painful indeed, Kahalau was so filled with unmatched anger in front of him, and Kaina was hit, and he fell, and he was stomped upon at the buttocks, and it was finished by the interceding of the alcohol-drinking friends, and Kaina withdrew from the presence of Kahalua, and afterward, Kaina came back again, he was an unparalleled enemy of Kahalau, he went and met with Kaina (it is said that Kahalau loved Kaina, and Kaina rejected it), that time, Kaina was stomped upon at the neck by Kahalau, and he was hit. That time, the breath of Kaina gasped at his time of feebleness to enter into quick death inside of his pleasuring in the drunkenness of alcohol, it is said, great was the strength of Kahalau that time, the multitudes were scared indeed. That time, Kaina was the one being left in trouble, and indeed everyone was feeling great sorrow inside of the drunkenness of the alcohol, Kamokumaia quickly fled, to where the Judge was gotten, to arrest Kahalau, the one who beat up Kaina, that time, Kahalau, the one who beat Kaina also arrived, at the place of the Judge, and he was quickly arrested, three policemen were

sent to see the bodily injuries of Kaina, the one who was beaten by Kahalau, on the 20th day, Kahalau, the one who beat Kaina was charged in front of JW Keawehunahala, District Judge, for the breaking of chapter 9 section 6-8 of the Law, "crime" penalty to Kahalau, it is the courthouse to consider the words of the witnesses [evidence] pertaining to sections charged by the officer against Kahalau by the offenses raised here. The bodily injuries of Kaina have appeared in front of the courthouse displayed for the side of the officer, two people will arise on prosecution. This lawsuit has been left for the jury to decide anew.

On day 21, Kahalau was taken by the hand of the Sheriff, to be secured until the placement of the court jury on October 7, 1861, on the 22nd day, Judge John H. Brown Esy together with the doctor arrived, and at that time, they quickly called the karonero [coroner?] to come to consider the reason for Kaina's death. Here are the coroners: J. Hanaloa, J.B. Makea, J. Amara, J.P. Kauwalu, J.A. Kawi, J. Hakuaulani, at 10am the questioneing the witnesses will beginin front of J.W. Kewaehunahala the Karonero, with the displayed in front, with the police chief of O'ahu island, J.H. Brown Esy, until the examination of evidence was finished. The importance of their decision, "Kaina died from Kahalau due to his beating and stomping on September 18," was first spoken above, it was the court to consider.

Here also, Hianana was charged, the one who first spoke above, for his making the alcohol and fined $100. For breaking chapter XLII section I of the Law, penalty in the wrongful crimes of the government, understand that drunkenness was the reason for this death. J.P. KAUWALU.
Waialua, O'ahu, September 26, 1861.

Ke Alaula: KE ALAULA. Buke II, Helu 4, Aoao 13. Iulai 1867. *(1 July 1867)*: page 15

KA HOIKE KULA SABATI O WAIALUA.

Ikeia na maka olioli o na keiki e akoakoa ana ma ka puu maniania ma ka hale o ke kahu o Rev. M. Kuaea i ka hora 9 o ke kakahiaka o ka Poalima, Iune 21. Hooponoponoia ka huakai, a i ka hiki ana mai o ke kula kaikamahine mai ko lakou hale kula nui, ua haawiia na hae i kela kula a me keia kula, a i na papa a pau hoi o ke Kula Sabati o Kawailoa. He umi papa o ke Kula o Kawailoa, me ko lakou mau hae he umi. He hae okoa hoi ko Waimea, Waialee, Kamooloa, a me ko Mokuleia. He umi-kumamawalu ka nui o na hae i ka huakai hele. Hiehie ka nana'ku i ka hele ana o ka huakai o na keiki a me ka poe opio o na Kula Sabati me ko lakou mau hae e welo ana i ka makani, a me ke kani ana o na leo o na keiki e hosana ana. A komo ka huakai i ka luakini, piha loa ka hale. Eia na haawina i hoike pono ia e kela kula keia kula:

Kula o Mokuleia--ua kulaia no ka aa ana o na laalaau ma Horeba.
Kula o Waimea—ka haawiia o ke kanawai ma Sinai.
Kula o Waialee—ka hoi ana mai o na kiu.
Kula o Kahuku—Ruta a me Naomi.
Kula o Kamooloa—no ka haawiia o Samuela ia Eli.

Kula o Kawailoa, papa o na kanaka ui--kulaia ma ka hoopaahaoia ana o Iesu. Papa o na wahine opio--ka moolelo o Iakoba. Papa o na makua--no Aarona a me kana mau keiki. Papa 4--Adamu laua o Ewa, a me Edena. Papa 5--Noa a me ke kaiakahinalii. Papa 6--no Aberahama. me kona pule no Sodoma. Papa 7—no ko Aberahama mohai ana ia Isaaka. Papa o na pokii—no Mose i kona wa liilii.

Ua kukulu pakahi ia keia mau kula a me na papa, a ninaninau pono ia no keia mau haawina a pau, a ua ikeia ka makaukau o na kula a me ka mikiala o na haumana. Olioli na makua o ka pono i ka ike ana i ka aoia o na keiki o keia hanauna o Waialua a makaukau ma ka Baibala.

He nui na malihini a me na makamaka o na apana a me na mokupuni e i launa mai a hauoli pu me na keiki i keia la nui o ka makahiki. Kamailio mai no kekahi o lakou, a hoolana i ka manao o na kumu a me na haumana

A pau ka hana o loko o ka luakini, ua kukulu hou ia ka huakai, a hele aku na kula malalo o na hae i kahi o ka lanai nui i hanaia e na makua i wahi e ahaaina ai. Ai pu na keiki, a me na makua, a me na malihini, a me na makamaka, a maona like i na mea momona i hoolakolakoia.

SUNDAY SCHOOL EXHIBITION OF WAIALUA

The rejoicing eyes of the children gathering are seen on Maniania Hill of the home of the minister Rev. M. Kuaea at 9am on Friday, June 21. The journey was arranged, and at the arrival of the girls' school from their great school house, the flags were given to every school, and to all the classes of the Sunday School of Kawailoa. There are 10 classes of Kawailoa, with their 10 flags. Waimea, Waialee, Kamooloa, and Mokuleia have a different flag. There were 18 flags total on this trip. The scene was festive at the going on the trip of the children and teens of the Sunday School with their flags fluttering in the wind, and the voices of the children sounding Hosana! And the journey entered into the church, the building was very full. Here are the assignments that were shown well by every school:

Mokuleia School--they were taught of the burning bush at Horeb.
Waimea School--they were given the law at Sinai.
Waialee School--the return of the Jews. Kahuku School--Ruth and Naomi.
Kamooloa School--the giving of Samuel to Eli.
Kawailoa School, class of the beautiful people--they were taught the imprisonment of Jesus.
Class of teenage girls--the story of Jacob.
Class of adults--Aaron and his children.
Class 4--Adam & Eve and Eden.
Class 5--Noah and the great flood.
Class 6--Abraham and his prayer for Sodom.
Class 7--Abraham's sacrificing Isaac.
Class of the little ones--Moses in his childhood years.

These schools and classes were each built up, and were questioned well concerning all of these assignments, and the readiness of the schools and the alertness of the students were seen. The adults rejoiced in the goodness in seeing the surety of the children of this generation of Waialua competent in the Bible.

Many were the visitors and the friends of the districts and islands to meet happily with the children on this great day of the year. Each of them conversed, and cheered up the thoughts of the teachers and the students. And when the work inside the church was done, the journey was set up again, and the schools below their flags went to the place of the great *lanai* that was made by the parents to a place that they would feast. The children ate together with the parents and the visitors and the friends, until they were all filled with the sweet things that had been provided.

Ka Nupepa Kuokoa: Vol. 6, No. 42 *(19 October 1867)*: page 2

NA MEA HOU O KEEHUKAI.—Ma ka lokomaikai o Natanaela, ua loaa mai keia mau mea hou: Ma Waialua ke Alii Emma Kaleleonalani, i kela pule ae nei, Poalima, a ua ike iho nei i na kaiaulu o ua aina Ehukai nei olalo—Ua kokua ia mai no e na kamaaina, a ma ka Poaono ae, holo aku la oia e makaikai ia Ukoa, i ka lua o na kupueu oia Loko, oia hoi ka lua o Laniwahine, a no ke ahiahi loa, ike pono ole ia ka lua—Ma ka Poakahi ae la 7, holo i Waianae ma ka lae o Kaena ae ka hele ana, ua lohe mai makou, ua kokua maikai ia

e na kamaaina o Waianae —hoi mai oia ma ka puali o Kolekole ma ka la 9 ae Poakolu, a hiki hou ma Waialua. Poaha ae holo hou no e makaikai hou i na lua o ua Laniwahine nei i ike maopopo ia ai hoi, no ka mea, wahi a kamaaina, o ka wa kakahikanui ka wa e ike pono ia ai. A i kona wa nae e makaikai ana, ua lawaia kamokoi aholehole oia i kekahi mau minute, ai ia no nae e ke aholahole. Ma ke ahiahi no o ia la, holo aku la i na Pali hauliuli, o Koolauloa, moe ma kahi o J. Kaluhi Esq., ka Lunakanawai oia mau Apana. Ao ae Poalima, holo loa i Kaliuwaa, i kahi a Kamapuaa i noho ai, a malaila aku moe i Kahana, Poaono ae hoi loa mai i Honolulu, o ka pau no ia o kona moolelo.

Ua pau o Lokoea i ka hana ia a me ka auwai o Ukoa, oia hoi na loko ia nui o ke Ehukai nei, e ke Konohiki hou o ua mau loko nei. Ua lohe mai nei makou mai a Kapena Pae mai o ke kiakahi Wailele i kona hoea ana ae ma ka lae o Kaena i ka la Sabati nei, ua ike oia ma ka moana i ka piha loa i na akaakai i waele ia ai o ua Lokoea nei, a hala loa ae ma ka moana mawaho ae o Waialua ponoi. He 3 wale no la i waele ia ai e na keiki kupa o Waialua nei, na kane, na wahine, na keiki he mau haneri paha ka nui—Ua ike paka iho ke Alii Wahine.

This article talks about several news tidbits regarding Keehukai. Most of the news centers around a visit by Aliʻi Emma Kaleleonalani, the wife of Kamehameha IV, who by the time of this article's writing, had already passed away. According to this article, Queen Emma visited the "villages of the lands of Ehukai." Her visit to Ukoʻa is specifically mentioned, where she went to see the dwelling place of Laniwahine. From there she traveled around Kaʻena to visit Waiʻanae, then came back to Waialua via Kolekole. When she came back to Waialua, she once again went to visit the dwelling place of Laniwahine at the fishpond, where she also went pole fishing for ʻāholehole this time. After that, she went to the district of Koʻolauloa, and then finally returned to Honolulu.

The second bit of news mentions that work on Lokoea and the waterway of Ukoʻa had been finished. It calls these two "the great fishponds of Ehukai." The work was carried out under the direction of the new konohiki of the ponds. To what extent was this work a construction of something new, and to what extent was this work the maintenance of how it already was, is not clear. But what is clear is that for three days, several hundred men, women, and children of Waialua helped to clear Lokoea of its ʻakaʻakai, or bulrush marsh plants, and the ocean outside of Waialua was filled with the multitude of these dead plants. At the end of this portion of the article, it says the queen was also there looking on and advising.

Ka Nupepa Kuokoa: Vol. 6, No. 48 *(30 November 1867)*: page 2

UNIHIPILI.—He umi ka nui o na akua unihipili ma ke kahawai holookoa o Kawailoa. He keu ka o Kawailoa o kahi nui o ka unihipili, ke pau la ka umi ilaila. Hookekee paha kekahi akua, hooninipo hoi kekahi, hoopunini mai paha kahi akua no ka malama ole ia o kekahi, a lilo i kekahi e malama ai.

SPIRIT OF THE DEAD.—The number of dead spirits at the entire river of Kawailoa is 10. Kawailoa is extreme for its many places of the spirits of the dead, it is all the 10 there. Maybe some of these spirits are crooked, some also are drowsy, some spirits are drifting due to no care of some of them, and some are overcome by care.

Ka Nupepa Kuokoa: Vol. 7, No. 35 *(29 August 1868)*: page 1

KA HIKI ANA MAI O KA AU-WAA O HOOMAILEANUE MAWAHO PONO O WAIALUA, A PAE IUKA.

I ka wanaao pulehulehu o kekahi la ae, ua ike aku la na kanaka ala kakahiaka nui i keia mea uliuli, a hauwalaau, a wawa, e hoonakeke ai mawaho iho, eia ka o ka auwaa o ua hunona nei a ua o Kaukanapokii; o ka hoala ia aku la no ia o na kanaka a pau, a hoa mai la i ka imu o ka puaa, mai ka Lae o Kahuku a ka Lae o Kaena ka a o ua mea he imu puaa, ka

ilio, ke koelepalau, ka maia kulolo, a me ka ulu, ke kalo kulolo, ahiawela ua mea he ahi, o ka a mai la no hoi mai uka o Kawailoa a hiki i kai o na alii, hele a malamalama o uka, hele no hoi a malamalama o kai, a kohu ike ole ia no ke awa e hookomo mai ai ka auwaa. A no ka manao no kekahi o ka poe malihini o ke ao ae no ia, noho no lakou i waho a no loa ae. I lawa no i ke ao ana, halakika ana kahi waa kialoa o ua mau wahi luna elele nei a Hoomaileanue, a pae i kaha-one, he mea manawa ole ia, o ka waa o ua mau wahi kanaka nei, he mea ole ia i na kamaaina, hiki ana i kahi kau-waa, a hele e auau, a wehe ka malo wai, aahu ke kapa maloo, a hele aku la i hahi o Kaukanapokii, a hai aku la i na olelo a pau, a kii ia aku la ka auwaa e hookomo mai. A ua pae mai la na poe a pau iuka, a ua hookipa ia ae la kela a me keia ma kauhale kamaaina, mai Waimea a hiki i Mokuleia ka paa i na kauhale a me na kanaka, a o kekahi poe no, noho oihuauwaa iho la no. A ua hookipa ia ae la o Hoomaileanue ma kekahi hale nui a nani, a maikai loa, me ka ike oleia mai e na poe e ae, o Kaukanapokii wale no, a me na Kahu o ua keiki la o Kukulu o Kahiki, a pela i hana ia ai na mea e pili ana ia ia, a hiki i ka wa i hoohalawai ai laua me ka moopuna kua-lua a Hawea o lumi o Kaala, kela kuahiwi a ka nani i noho ai.

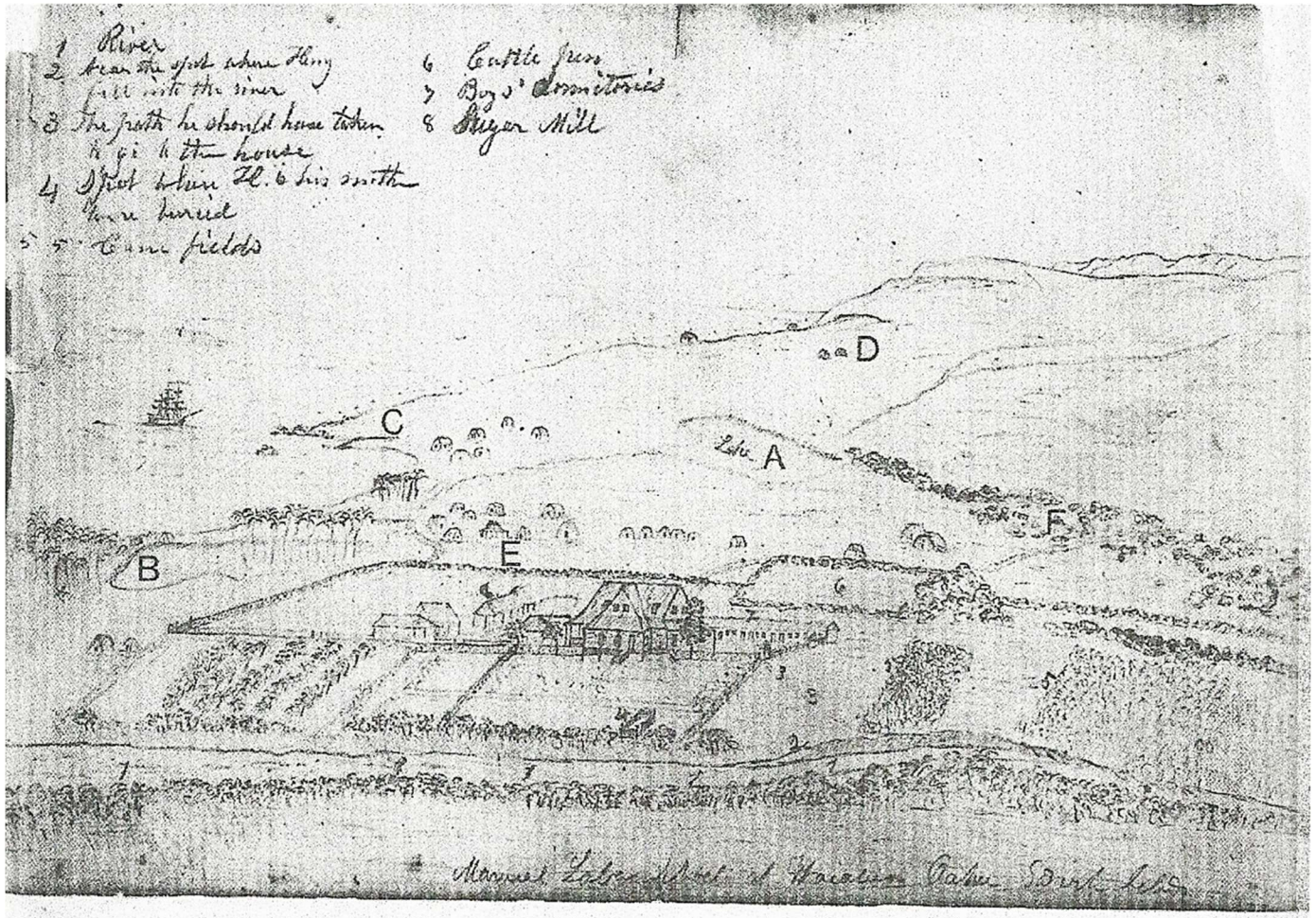
THE ARRIVAL OF THE CANOE FLEET OF HOOMAILEANUE DIRECTLY OUTSIDE WAIALUA, AND ITS COMING ASHORE

In the twilight dawn one day, the people rising in the dark in the early morning saw, and chattered, and rumored, that outside was the rattling, here was the canoe fleet of the in-law of Kaukanapokii, when all the people had awakened, and the imu of the pig had been lit, from Kahuku Pt. to Kaena Pt., the lighting of the aforementioned imu of the pig, the dog, breadfruit-poi, the banana pudding, the breadfruit, the taro pudding, hot was the fire, a fire, burning indeed from the uplands of Kawailoa to the sea of the chiefs, the uplands became bright, and then toward the sea became bright as well, and it was not seen similarly for the harbor that the canoe fleet entered. And for the thoughts for some of the visitors for the day, they stayed outside a long time. And when they had enough of being wary, one of the smaller swift canoes of the high messenger of Hoomaileanue above passed forcefully and landed on the sand. it wasn't a short time, the canoe of the people, it was nothing to the natives, arriving to the place of the canoe, and went to swim, opening the soaked malo, putting on the dried kapa, and went to hahi [?] of Kaukanapokii, and told all the speeches, and the canoe fleet was fetched to enter. All of the people came ashore, and everyone was welcomed in the village, from Waimea to Mokuleia the firmness in the homes and the people, and of some people, sat at the canoe fleet. And Hoomaileanue was greeted at a great house of beauty, and very well, not being seen by other people, only Kaukanapokii, and the caretakers of the child Kukuluokahiki, and like that everything was done concerning this, until the time that they met with the great-grandchild of Haweaolumi of Kaala, that upland of beauty that was lived in.

Historic Maps and Illustrations

Historic maps, drawings, and photos help to paint a picture of Kawailoa in years past and illustrate the many changes that have taken place in the region. An early sketch of Lokoea and ʻUkoʻa Fishponds was done in 1842 or 1843 by Edwin Locke (Figure 5). The sketch shows Lokoea Pond flanked with coconut trees, and several structures nearby. The Anahulu River is in the foreground, and a foreign sailing ship can be seen in the distance. Several loʻi and stone walls are visible near the fishpond. ʻUkoʻa Pond is located at the ma kai end of what looks like a stone wall labeled "dryland farming." Two structures named "the fishing hamlet of Kapaeloa" (label D) are to the northeast just off of the coast.

The earliest map found for the region, drawn in 1876, shows the project area but with little detail (Figure 6). A few place names and topographic features are illustrated, and a cluster of structures is



8.1. Lower Anahulu River, 1842 or 1843. Sketch by in Locke. By permission of the Houghton Library, Harvard versity.

(A) 'Uko'a Pond; (B) Lokoea Pond; (C) Pua'ena Point; (D) Kapaeloa; (E) Nāuahi *mā*; (F) dryland farming.

Figure 5. An 1842 or 1843 sketch of the Lower Anahulu River by Edwin Locke (in Kirch and Sahlins 1992:174).

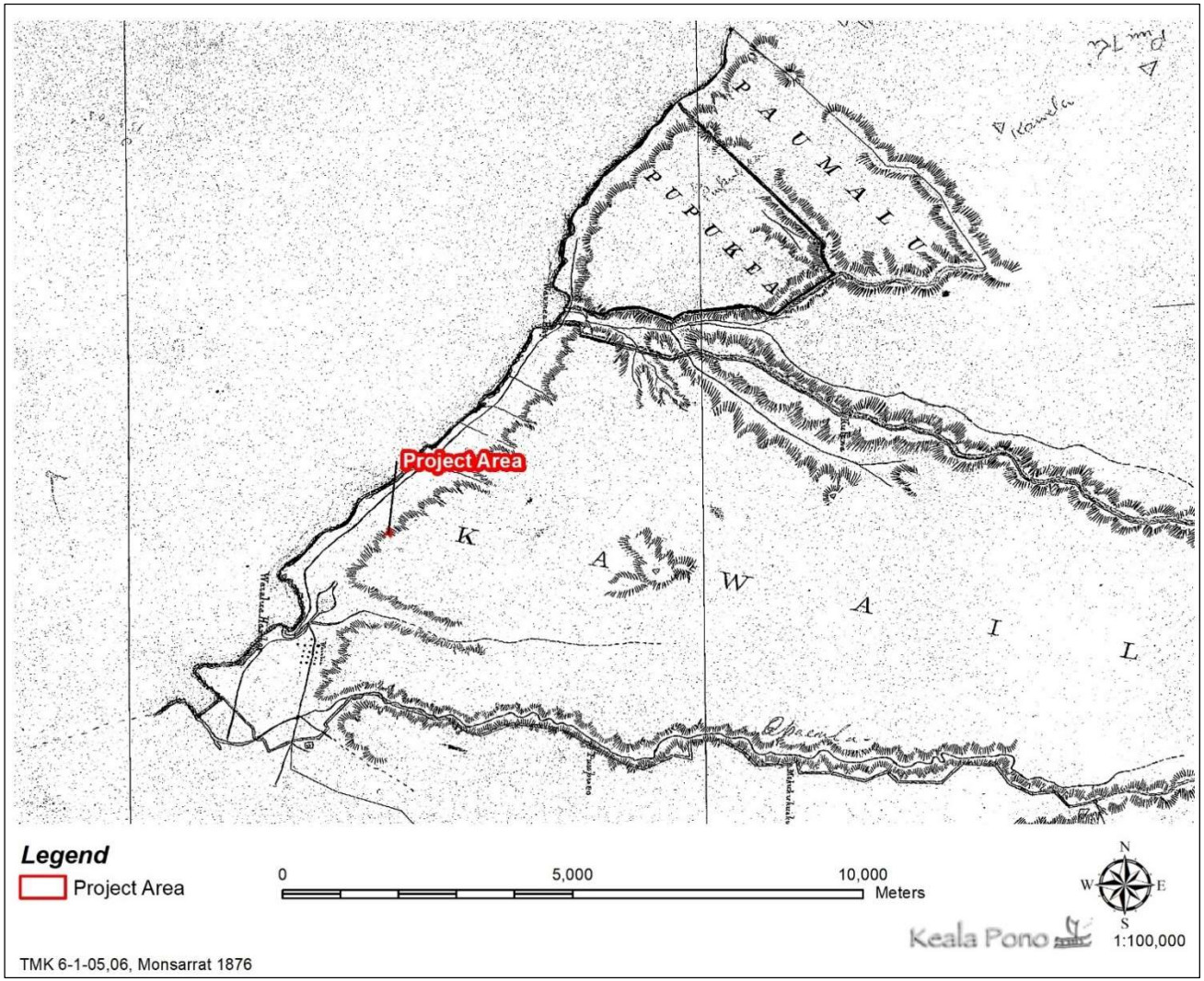


Figure 6. Portion of a historic map of Kawailoa (Monsarrat 1876). The approximate project location is indicated in red.

depicted near Waialua Bay. Lokoea Pond and the Anahulu River can also be seen, but ʻUkoʻa Pond is not portrayed.

The next map is of the Waialua Agricultural Co. lands in 1901 (Figure 7). The coastline is shown, along with the OR&L railroad with extensions into inner Kawailoa. In the vicinity of the project area, a pump with a pipeline extending ma uka is depicted, along with several structures, two of which are labeled "Tanks." The ʻUkoʻa Pond area has a rice field and is labeled as "Swamp." This swamp land has multiple LCAs on the ma uka side. The project area is located on an offshoot from the main railroad line.

A 1902 Hawaiʻi Territory Survey map of Oʻahu illustrates the type of land and land use for the region (Figure 8). The southern part of the ʻUkoʻa Pond area is labeled as wetlands for rice and taro (blue stripes). The project area and the pond are situated within a coastal region designated as grazing lands (yellow outline). Ma uka of the grazing lands are the sugar plantations (red outline). Two reservoirs are shown in the uplands, and the Oʻahu Railroad is also visible.

Māhele Land Tenure and Ownership of Kawailoa

The change in the traditional land tenure system in Hawaiʻi began with the appointment of the Board of Commissioners to Quiet Land Titles by Kamehameha III in 1845. The Great Māhele took place during the first few months of 1848 when Kamehameha III and more than 240 of his chiefs worked out their interests in the lands of the Kingdom. This division of land was recorded in the Māhele Book. The King retained roughly a million acres as his own as Crown Lands, while approximately a million and a half acres were designated as Government Lands. The Konohiki Awards amounted to about a million and a half acres, however title was not awarded until the konohiki presented the claim before the Land Commission.

In the fall of 1850 legislation was passed allowing citizens to present claims before the Land Commission for lands that they were cultivating within the Crown, Government, or Konohiki lands. By 1855 the Land Commission had made visits to all of the islands and had received testimony for about 12,000 land claims. This testimony is recorded in 50 volumes that have since been rendered on microfilm. Ultimately between 9,000 and 11,000 kuleana land claims were awarded to kamaʻāina totaling only about 30,000 acres and recorded in ten large volumes.

In the time preceding the Māhele, Kahekili Keʻeaumoku, brother of Kuhina Nui Kaʻahumanu, served as the chief of Waialua District. Upon his death in 1824, the Waialua lands were passed to Keʻeaumoku's sister Lydia Kekuapiʻia Nāmāhana. When Nāmāhana died five years later, Kaʻahumanu inherited the lands, and upon her death in 1832, they were passed to her niece Kīnaʻu. After Kīnaʻu's 1839 death, the property was transferred to Victoria Kamāmalu under LCA 7713:33. During the Māhele of 1848, Kamāmalu ceded the lands from Kamananui to Kaʻena, and they became government lands. She did not cede the ahupuaʻa of Kawailoa, however, and it remained in her possession, along with the adjacent ahupuaʻa of Paʻalaʻa until her death.

> [Kamāmalu's] entire estate was inherited by her father, Kekūanaoʻa. He died two years later and the estate went to Kekūanaoʻa's son Lot Kapuāiwa, who by that time reigned as Kamehameha V…Kapuāiwa died in 1872, whereupon Ruth Keʻelikōlani, Kapuāiwa's half-sister, petitioned for and received in 1873 the entire estate…By 1883, Ruth Keʻelikōlani died, leaving all of her estate to her cousin Bernice Pauahi Bishop. (Kameʻeleihiwa 1992:309–310)

Currently, the Kamehameha Schools (Bishop Estate) has ownership of the majority of the Kawailoa Ahupuaʻa.

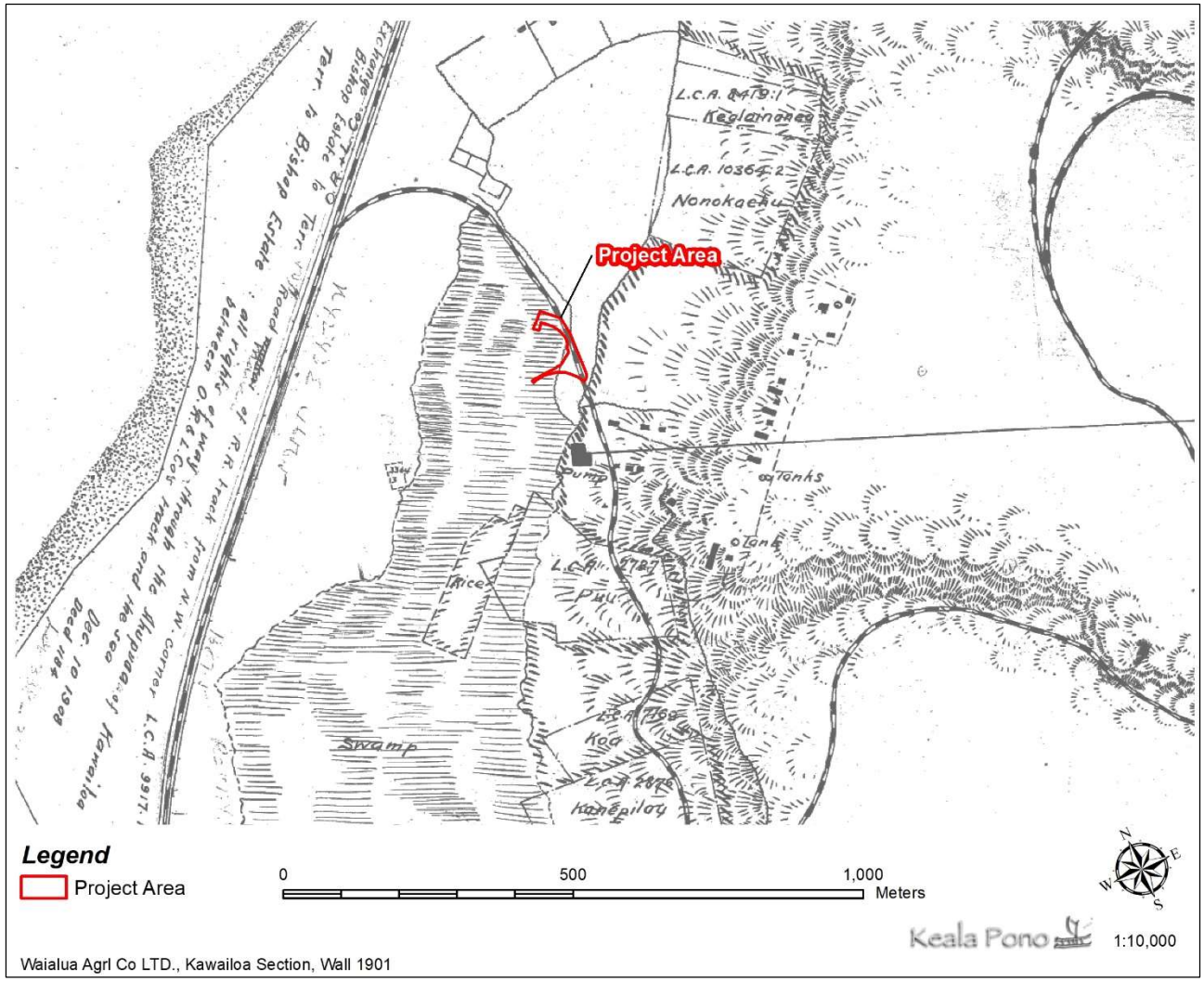


Figure 7. Portion of a historic map showing the Waialua Agricultural Co. lands (Wall 1901).

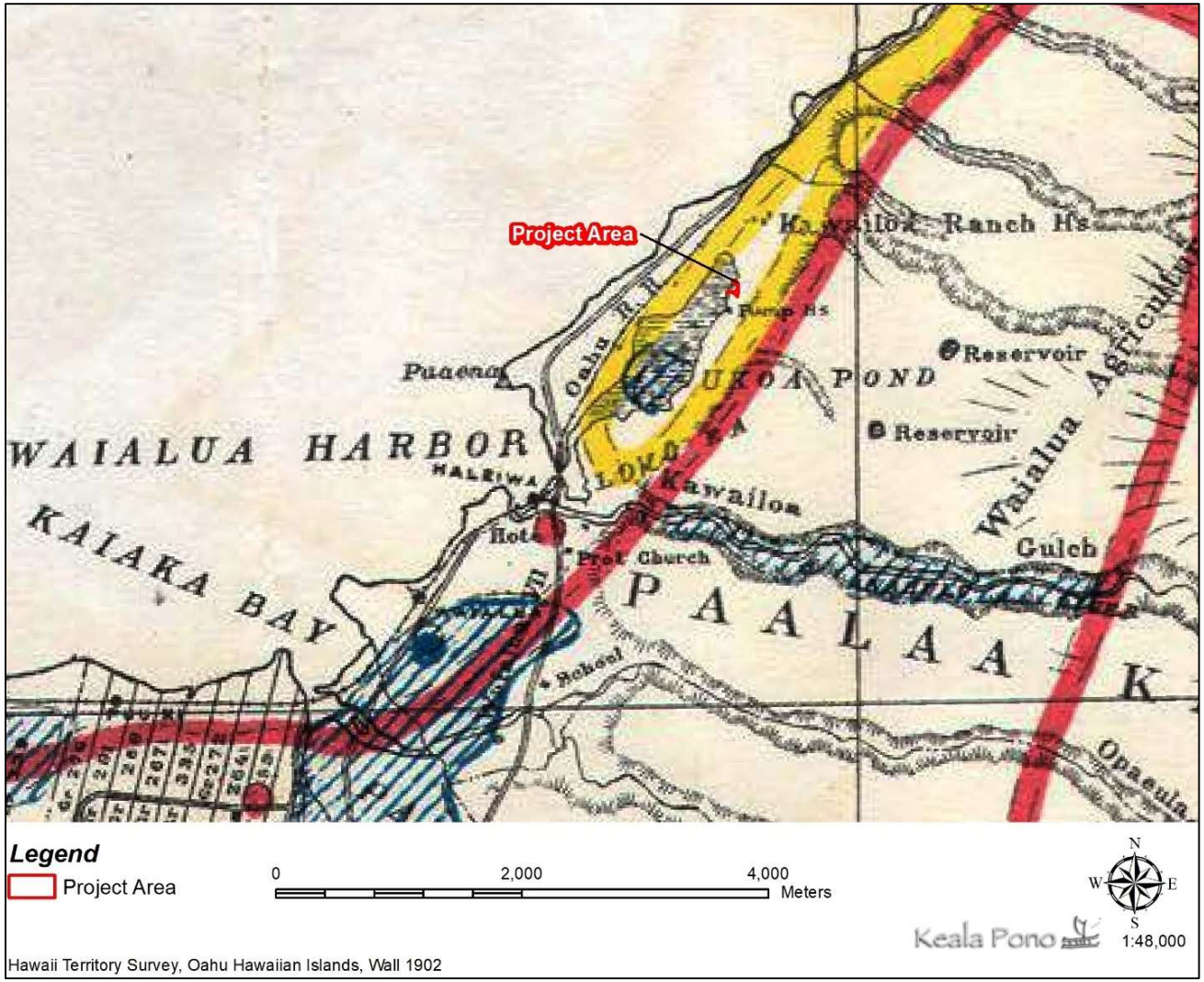


Figure 8. Portion of a Hawai‘i Territory Survey Map of O‘ahu (Wall 1902).

In 1850 kuleana awards for parcels within Kawailoa were granted to individual tenants. A total of 93 kuleana claims were made for Kawailoa Ahupuaʻa and 79 were awarded (Waihona ʻAina 2014). No claims were awarded for the project parcel, however there were several other LCAs nearby (see Figure 2).

Claim 10364:2 by Nonokaehu was for three ʻāpana in Kawailoa. This plot is part of a cluster of three adjoining LCA to the east of the project area. LCA 8419:1 was 4.12 acres and was awarded to Kealainanea. Māhele documents state that "he has had this land from the time of Kamehameha I and it is undisputed." The final LCA in this cluster is a 2.57 acre lot claimed by Kaukaliu under LCA 7417:1. In his testimony, he mentions that his land is bordered on the east by the Niuula watercourse and was given to him "from Kealainanea in the time of Kinau." Adjacent to the landfill lands on the ma kai side is LCA 8304:3, a small .26 ac. parcel claimed by Kalamahiai. Kawailoa Drive now runs directly over this LCA.

An interesting find in the Māhele data was the establishment of collective enclosures at ʻUkoʻa and Lokoea Ponds. These units were created to protect field plots from destruction caused by cattle. The enclosures were vast, as historic sources state that more than two miles of fencing was put up in ʻUkoʻa, with 60 farmers sharing the land (Linnekin 1983).

Post-Māhele Land Use

Ranching began in Kawailoa shortly after the Māhele. Land grants were given to Native Hawaiians and unclaimed plots were made available for lease and eventual ownership. At this time, much of the privately owned land was used for cattle ranching, and to a lesser degree, agriculture. In most cases, extensive logging efforts preceded ranch operations in order to expand pastureland and provide wood for fences.

In 1881, B.F. Dillingham and John H. Paty, owners of a dairy farm in Mānoa began relocating cattle to ranches in Kawailoa and Waimea on properties leased to them from the Bishop Estate. As part of the "Great Colonization Scheme" which ultimately fell through, owners of the three largest ranches on Oʻahu united. This included the Honouliuli Ranch and Kahuku Ranches owned by James Campbell, the Kawailoa and Waimea Ranches owned at this time by John J. Patty, and part owners of the Kawailoa and Waimea Ranches, M. Dickson and J.G. Spencer. The prospectus for this deal describes the Kawailoa ranch lands in detail:

> Kawailoa and Waimea Estates contain 23,000 acres surveyed land, and about 20,000 acres unsurveyed, all held on lease having an unexpired term of 24 years, at a yearly rental of $2,200. This rental is at present reduced to $1,700 by subletting a few acres of taro (wet) land. There are 36 miles of new 5-feet wire fence set on California redwood posts. It is further subdivided into paddocks of from 200 acres to 4,000 acres each, enabling the proprietors to pass their stock from one feeding ground to another as may be advisable. This land is well adapted throughout for fruit growing or pastoral purposes. There are several wells with wind mills on them to supply water for stock. A reservoir has been built at the Kawailoa ranch with a retaining wall 150 feet in length, 100 feet thick at bottom, 5 feet at summit, capable of storing 1,127,500 cubic feet of water, for an outlay of $2,250. (Thrum 1886:76)

Agriculture intensified after 1882, when wells and reservoirs such as the one mentioned above were established. A decade later, 180 acres of rice was being cultivated in the Mokulēʻia, Kamananui, and Kawailoa ahupuaʻa (Coulter and Chun 1937). The rise in population of the Waialua District from 939 in 1878 to 1,286 in 1890 is attributed to the Chinese laborers who moved into the region while working the fields (Schmitt 1977:13).

Dillingham, who owned the O‘ahu Railway and Land Co. (OR&L) railroad, extended the previously existing track around Ka‘ena Point to service the Halstead Plantation’s sugar mill in Waialua. The railroad followed the same corridor as the current Farrington Highway from Ka‘ena Point to Waialua, and the track was later extended through Kawailoa ma kai of the project area to Kahuku. The Halstead Plantation as well as other ranches and plantations in the Waialua District was purchased by the Waialua Agricultural Company, Ltd., which was established in 1898 and continued to be profitable well into the 20th century. At one point, Dillingham acquired land from Gaspar Silva and James Gay to establish a 7,000 acre property, primarily for sugarcane (Yardley 1981:191–199).

In addition to agriculture, dairy farming was another prominent industry of the region surrounding the project area with pastures and infrastructure on nearby lands (Figure 9). The Dairymen’s Association, later called Meadow Gold Dairy, was established in 1897 and began operations at their main dairy and farm in Kawailoa near the project area. Meadow Gold Dairy was later acquired by Beatrice Foods in 1986, then Dean Foods in 2001. The dairy was a key business in the region and even had a surf spot directly offshore nicknamed Dairymens or Dairies because of the smell from the farm.

Journal entries from the early 1890s speak of Kawailoa Ahupua‘a and the entire district of Waialua as a preferred hunting area for kolea, “native wild duck,” wild chickens, pheasants, wild boar, and wild turkeys. A journal from Perkins describes the hunting area:

> At this time Waialua was much visited by sportsmen of Honolulu, as great numbers of golden plover were scattered over the forehills and along the coast. The native wild duck was common on the ponds and there were a good many pheasants amongst the lantana on the plains, but still more on the dry forehills below the forest and within this, before the trees become continuous or dense. At intervals during the day the plover habitually resorted to the ponds near the coast, usually in small flocks at a time, and were shot from blinds…Some of the men that I met at Waialua were very fine shots and on their weekend visits made large bags of duck and plover. In the mountains there were few wild chicken and here and there some wild turkeys…
>
> Thick forests, no doubt, once came down at least 700 feet, for there were many traces of fires, some very old and some comparatively recent. Great herds of wild pigs may sometimes be seen crossing the flats between the gulches, where they chiefly hide. I counted 42 in one lot, of different sizes, from the largest boar with great tusks to pigs only half grown… (Perkins 1892–1893)

By the early 1900s, land in Kawailoa was being used to grow taro, rice, and sugarcane, with some cattle ranching and dairy farming still taking place as well. Traditional cultivation of taro using perennial streams and coastal springs continued in the area into the 1930s (Handy et al. 1972). In 1921, the concrete “Rainbow Bridge” at the entrance of Hale‘iwa Town was built to replace an earlier wooden version. The bridge, which allows Kamehameha Highway to cross the Anahulu River, has become an icon of the North Shore.

The latter half of the 20th century has seen increased construction activities, particularly concentrated around Hale‘iwa Town, but also the development of the Hale‘iwa Small Boat Harbor and modifications to Ali‘i Beach Park. The boat harbor was authorized in 1960 and completed in 1966 (Hammatt et al. 2005) while the activities at Ali‘i Beach Park have continued into recent years.

Previous Archaeology

A wealth of archaeological studies have been conducted in Kawailoa. The following discussion provides information on archaeological investigations that have been performed within the vicinity

Figure 9. The main building at Meadow Gold Dairy in 1974.

of the project area (Figure 10). Table 1 lists previous archaeological projects and their results, while Table 2 records archaeological sites in the vicinity. Archaeological sites with known locations are shown in Figure 11. State Inventory of Historic Places (SIHP) numbers are prefaced by 50-80-04.

One of the earliest island-wide archaeological studies was conducted in the 1930s by J.G. McAllister (1933). In his study of O‘ahu, he recorded numerous sites located in Kawailoa. The sites closest to the project area are Site 236, ‘Uko‘a Fishpond and Site 237, Ili‘ilikea Heiau. McAllister describes the sites as follows:

> Site 236 ‘Uko‘a Fishpond
>
> One of two Waialua ponds; still in use. It is a long narrow fresh-water pond, approximately a mile in length. Most of it now overgrown with weeds. Laniwahine was a goddess (moo) of Ukoa and lived with her brother Puhiula. Between the pond and the sea was a tunnel through which Laniwahine passed when she wished to bathe in the ocean. Offerings were left for her on a stone, located near Pump Number 4 of the Waialua Agricultural Company. The site of this stone was marked for many years by a dead tree which was not removed because of its association with Laniwahine. Now neither stone nor tree is to be found.
>
> This is the pond to which Lehuanui was sent by Oahunui to obtain fish. Here Lehuanui and his retainers found “the fish packed thick at the *makaha* and were soon busily engaged in scooping out, cleaning and salting them.”

Site 237 Ili‘ilikea Heiau

> Destroyed in 1916 by W. Harpham for the Waialua Agricultural Company. Thrum describes it as: “Of two divisions 75 feet by 267 feet, its walls well defined, though in ruins.” Only a few large rocks indicate the former site, which is now covered with cane. (McAllister 1933:142)

McAllister (1933) recorded several other important sites farther away from the study area, including Site 234, Pua‘ena Point and Site 235, a stone with healing powers located to the west; as well as Site 238, Pu‘upea Heiau; Site 239, Punanue Akua Stone; and Site 240, Kohokuwelowelo Kahuna Residences to the east. The two heiau were reported as partially or completely destroyed (McAllister 1933:141–142).

Site 234 is Pua‘ena Point, or Kahakakau Kanaka. This is the location where Elani was placed upon his death, for his body to decompose, and if a commoner had no one to care for his body after dying, it would be placed here (McAllister 1933:142). It is said that the fluids from the body would attract sharks, which were killed (McAllister 1933:142). Site 235 is a healing stone also called the Pua‘ena Stone and can be found on the point (Figure 12). It is a smooth, oval stone, partially covered by sand, and represents a woman named Pua‘ena. The stone was known for its healing powers, and people from all over the island would place limu on the stone and lay the injured part of the body upon it.

Site 238, Pu‘upea Heiau was located at Punanue Point, approximately 50 feet from the ocean at the Cooper house and was recorded by McAllister as having little remaining after construction of the residence. The heiau is described as a sand-paved enclosure with two large stones in the center and multiple small enclosures on the north end. At the time of his study, only the ma kai wall remained, which measured two to three feet high, but had probably been much higher at one time (McAllister 1933:142).

Site 239 is a small upright stone known as the Punanue akua stone. The stone measured 1.1 feet high and was said by “old Hawaiians” to be associated with a frog stone. McAllister noted that after speaking with several kūpuna in the area, none had heard of the stone (McAllister 1933:143).

Finally, Site 240, Kohokuwelowelo, is a residence for kahuna, which no commoners ever approached due to fear and respect (McAllister 1933:143–144). The site is located ma uka of Kamehameha Highway across from Punanue Point in a very steep and treacherous area. It consists of a complex of connected terraces, most with dirt floors, but a few were partially enclosed or had a small rock platform. It is said that the famous priest Ka‘opulupulu and his son stayed here when traveling through Waialua.

An archaeological inventory survey for the Hale‘iwa bypass highway included lands along what is now the Joseph P. Leong Highway inland of Haleiwa town and near ‘Uko‘a Pond (Chiniago 1979). Of the eight sites recorded, five were newly identified, however only ‘Uko‘a Pond (Site 236) is located near the current project area. Subsurface testing did not yield any traditional or historic deposits. The following was noted about the ponds and their water sources:

> The major drainages in the survey area are the Anahulu River, Opaeula and Helemano Streams [which converge to form Paukauila Stream], and an unnamed stream that drains Ukoa Pond and feeds into Loko Ea. (Chiniago 1979:5)

Two reconnaissance surveys were completed for the region in 1980 and 1985 (Sinoto 1980; Barrera 1985). The earlier study surveyed the coastline ma kai of the project area, while the 1985 study was completed ma uka of the project area on Kawailoa Road. Both studies produced no significant findings.

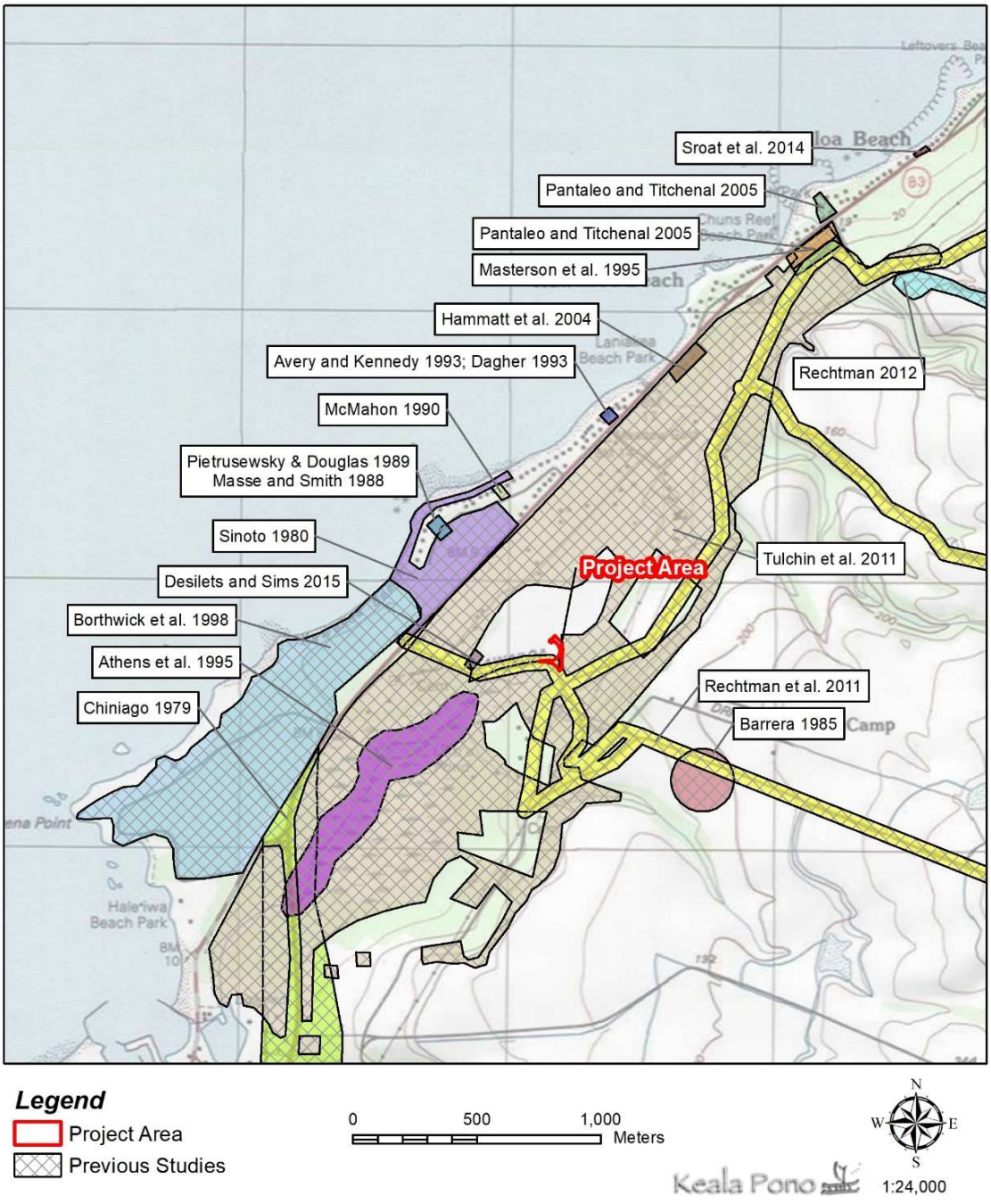


Figure 10. Previous archaeological studies in the vicinity of the project area.

Table 1. Previous Archaeological Studies in the Vicinity of the Project Area

Author and Year	Location	Work Completed	Findings
McAllister 1933	Island of O‘ahu	Archaeological Survey	Recorded and examined 384 archaeological sites on O‘ahu, 13 of which are within Kawailoa. Sites near the project area include ‘Uko‘a Fishpond and Ili‘ilikea Heiau.
Chiniago 1979	Hale‘iwa Bypass Road	Archaeological Survey	Recorded SIHP 1439, a historic artifact scatter; 1440, a wall remnant; 1441, an agricultural complex; 1442, the Emerson homestead; and 1443, an old church.
Sinoto 1980	Coastal Hale‘iwa	Reconnaissance Survey	No findings.
Barrera 1985	Ma uka of ‘Uko‘a Fishpond	Reconnaissance Survey	No findings.
Masse and Smith 1988	61-795 Papailoa Rd	Burial Disinterment	Human remains were removed from 61-795 Papailoa Road and was designated as SIHP 3956.
Pietrusewsky and Douglas 1989	61-795 Papailoa Rd	Osteological Report	Analysis of a human burial (SIHP 3956) found the skeleton to be of an adult male aged 45–50 years old of Polynesian descent.
McMahon 1990	Papailoa Rd	Burial Disinterment	Human remains were recovered from another coastal parcel on Papailoa Road. It was designated as SIHP 4240.
Avery and Kennedy 1993; Dagher 1993	61-669 Kamehameha Hwy.	Inadvertent Discovery of Human Remains and Archaeological Monitoring	Remains of at least three individuals were unearthed at 61-669 Kamehameha Hwy. and designated as SIHP 4670. Later archaeological monitoring documented a historic pit toilet.
Masterson et al. 1995	Chun’s Reef Support Beach Park	Reconnaissance Survey	Summarized conflicting evidence for the location of Pu‘upea Heiau.
Athens et al. 1995	‘Uko‘a Pond	Paleoenvironmental Research	Coring provided a record of sediments spanning 8,000 years. Lowland forests rapidly declined around AD 950.
Borthwick et al. 1998	Coastal Kawailoa	Archaeological Inventory Survey	Identified WWII remains (SIHP 5641 and 5643), a human burial (5495), a historic trash dumb (5644), a cultural layer (5661), and the previously identified Pua‘ena Stone.
Hammatt et al. 2004	Laniakea Beach Support Park	Archaeological Inventory Survey	No findings.
Pantaleo and Titchenal 2005	Chun’s Reef Support Park/Kawailoa Beach Park	Archaeological Inventory Survey	Documented human skeletal remains in a pit feature (SIHP 6768) with a possible stacked basalt cobble and boulder platform. Glass beads associated with the burial date to 1850–1880.

Table 1. (Continued)

Author and Year	Location	Work Completed	Findings
Tulchin et al. 2011	Kawailoa Ranch	Reconnaissance Survey	Recorded 82 pre- and post-contact historic properties, 15 of which were pre-contact or early post-contact traditional Hawaiian sites. 12 are associated with historic ranching activities, 8 were associated with the military, and 8 have an undetermined age.
Rechtman et al. 2011	Kawailoa Wind Farm	Archaeological Inventory Survey	Identified 17 historic sites: SIHP 7155, 7156, and 7158 are military-related, while SIHP 7157 and 7159–7171 are associated with former plantation activities.
Rechtman 2012	Kawailoa Wind Farm	Archaeological Monitoring	No significant archaeological findings. Three glass bottles dating to the 1940s were collected.
Sroat et al. 2014	61-405 Kamehameha Hwy.	Archaeological Monitoring	No findings.
Desilets and Sims 2015	62-140 Kawailoa Drive	Archaeological Inventory Survey	No findings.

Note: State Inventory of Historic Places (SIHP) numbers are prefaced by 50-80-04.

Figure 11. Archaeological sites near the project area with known locations.

Table 2. Archaeological Sites Near the Project Area

SIHP 50-80-04-	Name	Description	Reference
234	Pua‘ena Point/Kahakakau Kanaka	Location where dead bodies would be left to decompose.	McAllister 1933
235	Pua‘ena Stone	Smooth, oval stone on the beach at Pua‘ena Beach Park said to have healing powers.	McAllister 1933; Borthwick et al. 1998
236	‘Uko‘a Fishpond	Roughly one-mile long fishpond said to be the home of a mo‘o named Laniwahine.	McAllister 1933; Chiniago 1979; Athens et al. 1995
237	Ili‘ilikea Heiau	75 by 267 foot heiau reported as destroyed in 1916 during sugarcane operations.	McAllister 1933
238	Pu‘upea Heiau	Heiau at Punanue Point described as a sand-paved enclosure with two large stones in the center and multiple small enclosures on the north end. Recorded as mostly destroyed.	McAllister 1933
239	Punanue Akua Stone	Small upright stone measuring 1.1 feet high that is said to be associated with a frog stone.	McAllister 1933
240	Kohokuwelowelo Kahuna Residences	Residence for kahuna located in a steep area ma uka of Kamehameha Hwy. across from Punanue Point. It consists of a complex of connected terraces and is said that the famous priest Ka‘opulupulu once stayed here.	McAllister 1933
3400	Enclosure/pavement	Remnant of a small stone enclosure with an adjoining pavement located on a bedrock outcrop near the intersection of Kawailoa Dr. and Cane Haul Rd. It is noted as a possible foundation for a structure that is no longer standing.	Rechtman et al. 2011
3956	Burial	Inadvertently discovered human remains at 61-795 Papailoa Rd. of one individual, a male age 45–50 years old of Polynesian descent.	Masse and Smith 1988; Pietrusewsky and Douglas 1989
4240	Burial	Human remains found on a residential coastal parcel on Papailoa Rd.	McMahon 1990
4670	Burials	Human remains of at least three individuals found at 61-669 Kamehameha Hwy. A historic pit toilet was also documented.	Avery and Kennedy 1993; Dagher 1993
5495	Human burial	Human remains.	Borthwick et al. 1998

Table 2. (Continued)

SIHP 50-80-04-	Name	Description	Reference
5641	Military remains	Historic military structural remains dated to the WWII-era.	Borthwick et al. 1998
5643	Military remains	Historic military structural remains dated to the WWII-era.	Borthwick et al. 1998
5644	Dump	Historic trash dump.	Borthwick et al. 1998
5661	Cultural layer	Cultural layer.	Borthwick et al. 1998
6768	Historic burial	Human skeletal remains within a pit feature. The burial was laid upon a possible stacked basalt cobble and boulder platform. The presence of glass beads associated with the burial date it to 1850–1880.	Pantaleo and Titchenal 2005
7160 (CSH 69)	Terrace retaining walls	Post-contact walls associated with road construction.	Rechtman et al. 2011; Tulchin et al. 2011
7161	Historic foundation	A set of three historic concrete foundations.	Rechtman et al. 2011
7162	Historic alignment	A historic curbstone alignment.	Rechtman et al. 2011
7163	Culvert	Historic culvert associated with agricultural activities.	Rechtman et al. 2011
7164 (CSH 63)	Aqueduct	Historic aqueduct used for water control associated with agriculture.	Rechtman et al. 2011; Tulchin et al. 2011
7165 (CSH 64)	Culvert	Historic culvert used for transportation.	Rechtman et al. 2011; Tulchin et al. 2011
7166	Culvert	Historic culvert with two revetments associated with agricultural activities.	Rechtman et al. 2011
7604	Historic road	The historic 5.8-mile Cane Haul Rd. previously used to transport sugar to the mill in Waialua.	Tulchin et al. 2011
CSH 34	Post-contact foundation	Post-contact foundation made of basalt and mortar.	Tulchin et al. 2011

Table 2. (Continued)

SIHP 50-80-04-	Name	Description	Reference
CSH 35	Bunker complex	Historic bunker complex associated with military activities.	Tulchin et al. 2011
CSH 36	Cattle chute	Historic cattle chute associated with ranching activities.	Tulchin et al. 2011
CSH 37	Cemetery	Post-contact cemetery.	Tulchin et al. 2011
CSH 38	Pump station	Historic plantation pump station used for agricultural activities.	Tulchin et al. 2011
CSH 49	Terrace	Post-contact terrace of indeterminate usage.	Tulchin et al. 2011
CSH 50	Boundary wall	Possible pre-contact and post-contact wall used as a boundary marker.	Tulchin et al. 2011
CSH 51	Enclosure	Historic ranching enclosure.	Tulchin et al. 2011
CSH 53	Terrace and mound complex	Pre-contact terrace and mound complex with four features (A–D). It may be a possible burial site.	Tulchin et al. 2011
CSH 54	Terrace and modified outcrop	Historic terrace and modified outcrop used for habitation.	Tulchin et al. 2011
CSH 55	Enclosure complex	Pre-contact complex of enclosures used for habitation.	Tulchin et al. 2011
CSH 56	Upright	An upright boulder of indeterminate age possibly used as a marker.	Tulchin et al. 2011
CSH 57	Wall	Post-contact wall used as a boundary for ranching.	Tulchin et al. 2011
CSH 58	Enclosure and walls	Post-contact enclosure and walls used as a boundary for ranching.	Tulchin et al. 2011
CSH 59	Platform and walls	Pre-contact and post-contact walls and platform.	Tulchin et al. 2011

Table 2. (Continued)

SIHP 50-80-04-	Name	Description	Reference
CSH 60	Wall	Post-contact wall.	Tulchin et al. 2011
CSH 61	Enclosure	Historic enclosure.	Tulchin et al. 2011
CSH 62	Quarry	Post-contact basalt rock quarry.	Tulchin et al. 2011
CSH 65	Enclosure	Post-contact enclosure.	Tulchin et al. 2011
CSH 66	Terrace and enclosure complex	Post-contact complex associated with agricultural activities and possibly temporary habitation.	Tulchin et al. 2011
CSH 67	Trail and lithic scatters	Post-contact site associated with transportation and the quarry.	Tulchin et al. 2011
CSH 87	Mound complex	Post-contact mounds related to agricultural activities.	Tulchin et al. 2011

Figure 12. The healing stone at Pua‘ena, as seen in 1935 (courtesy of Thomas Shirai; his great-grandmother is shown in the photo).

A human burial (SIHP 3956) was inadvertently discovered and subsequently removed at a private residence at 61-795 Papailoa Road (Masse and Smith 1988). The remains were encountered in a sand dune on the property during shallow excavations for a pipeline. While some of the iwi were encountered in the backdirt, the majority of the burial was found in situ in a loosely flexed position. Osteological analysis found the skeleton to be of an adult male aged 45–50 of Polynesian descent (Pietrusewsky and Douglas 1989). The time and cause of death could not be determined, however it is noted that “the remains appear old.” A second burial was found just east of SIHP 3956 also on Paipailoa Road (McMahon 1990). The remains are recorded as SIHP 4240.

Human remains (SIHP 4670) were inadvertently unearthed at 61-669 Kamehameha Highway near Laniakea Beach Park (Avery and Kennedy 1993). The iwi accounted for at least three individuals (MNI=3). Archaeological monitoring for the same project area identified a historic pit toilet (Dagher 1993). Much later, an archaeological inventory survey was conducted at Laniakea Beach Support Park, which produced no findings (Hammatt et al. 2004).

In 1995, a reconnaissance survey was completed for the Chun’s Reef Support Beach Park (Masterson et al. 1995). The report summarized conflicting evidence for the location of Pu‘upea Heiau, which was recorded by McAllister as being mostly destroyed. An archaeological inventory survey was conducted a decade later for the same study area, which identified a human burial (Pantaleo and Titchenal 2005). The human remains (SIHP 6768) were found within a pit feature above a possible stacked basalt cobble and boulder platform. Grave goods included glass beads, which dated to 1850–1880, confirming that the burial was historic in age.

Paleoenvironmental studies were performed at ‘Uko‘a Pond (Site 236) in association with the Hale‘iwa bypass highway project (Athens et al. 1995). Core samples were analyzed for pollen, charcoal, and sediments, and provided a sequence of environmental change spanning approximately 8,000 years. The sequence was divided into four time periods or zones, with the earliest exhibiting an abundance of arboreal species. Between 1,000 and 500 years ago the forest began to decline, and

was completely replaced by open scrub land in a matter of 300 years. The change in the pollen record occurred at roughly AD 950 and is thought to correlate with human settlement of the area (Athens et al. 1995:119).

During an archaeological inventory survey of a 140-acre parcel along the coast near Pua‘ena Point six sites were recorded, including the previously documented Pua‘ena Stone (SIHP 235) (Borthwick et al. 1998). New sites consist of two military structural remains dating to the WWII-era (SIHP 5641 and 5643), a human burial (SIHP 5495), a historic trash dump (SIHP 5644), and a cultural layer encountered during subsurface excavations (SIHP 5661).

During an archaeological reconnaissance for the Kamehameha Schools 437-acre Kawailoa Ranch property located adjacent to the project area, 87 historic properties were documented (Tulchin et al. 2011). Of those recorded, 15 were pre-contact or early post-contact traditional Hawaiian sites, 12 were associated with ranching, eight were associated with military activities, and eight were of unknown age and function. There are 26 sites located near the current project area, four of which were given SIHP numbers (7160, 7164, 7165, and 7604). The majority are post-contact sites associated with the military, ranching, or agricultural activities in the area. Site CSH 37 is a post-contact cemetery located west of Kawailoa Drive and just ma uka of Kamehameha Highway. Closest to the project area is a boundary wall (CSH 50), an upright boulder used as a marker (CSH 56), a historic enclosure and walls possibly used for ranching and as a boundary marker (CSH 58), and a platform and walls of indeterminate function (CSH 59). SIHP 7604 is Cane Haul Road, a historic 5.8-mile long road beginning at Kawailoa Drive near the current project area and extending south. The road was built by the Waialua Sugar Company to transport cane to the mill in Waialua town.

An extensive inventory survey was conducted for the Kawailoa Wind Farms project (Rechtman et al. 2011). Within the 350-acre project area, 17 historic sites were found. Of these, three were related to military activity (SIHP 7155, 7156, and 7158), and 14 were associated with former plantations (SIHP 7157 and 7159–7171). Nearest to the current project area are SIHP 7160–7166. Also recorded during the wind farm survey were six previously identified sites and 19 new sites outside the limits of their study. Of these, the closest to the current project area is SIHP 3400, the remains of a small stone enclosure with an adjoining pavement remnant located near the intersection of Cane Haul Road and Kawailoa Drive. The age and function of this enclosure is not known, however it was noted as a possible foundation for a structure that is no longer standing.

SIHP 7160 and 7161 are located along Kawailoa Drive. SIHP 7160 consists of two parallel rock abutments made of basalt. SIHP 7161 includes three concrete foundations that were once part of the Kawailoa Camp Stables. Along the ma uka side of Kawailoa Drive north of the Kawailoa Road intersection is a curbstone alignment (SIHP 7162). SIHP 7163 is a stone and concrete culvert that passes under the Hakina Bypass Road. Between Cane Haul Road and Kawailoa Road is a large water pipe held up off the ground by pillars (SIHP 7164). A culvert located approximately 100 m south of the Cane Haul Road and Kawailoa Drive intersection was designated SIHP 7165. SIHP 7166 is situated along either side of Cane Haul Road. It is a concrete culvert with two stone revetments.

Rechtman et al. (2011:20) note that portions of Cane Haul Road were built over the old Waialua Sugar Company railroad. This was stated in a cultural impact assessment interview with Mrs. Causey (Genz and Hammatt 2011:71) and is also depicted on historic maps. Archaeological monitoring for the same project found no significant historic properties (Rechtman 2012). During grading, three glass bottles dating to the 1940s were collected at the Makai Interconnection Building area.

Archaeological monitoring was completed at 61-405 Kamehameha Highway for a residential project that included the demolition of an existing structure and the construction of a new one (Sroat et al. 2014). There were no findings during monitoring.

The construction of two buildings and a septic tank at 62-140 Kawailoa Drive required an archaeological inventory survey to be completed for the project (Desilets and Sims 2015). There were 14 test trenches excavated, all of which produced no evidence of cultural deposits or historic properties.

Settlement Patterns

The settlement of Anahulu Valley in Kawailoa has been studied extensively by Kirch and Sahlins (1992) and the discussion here is largely a summary of their work. Initial settlement of the Waialua region likely occurred early in time because of the abundance of natural resources, including fertile floodplains, fresh water, and marine life. Settlement was focused in coastal areas, near these abundant resources. By the 14th century AD, populations began to expand inland into upper Anahulu Valley, where rockshelters were used as temporary habitation sites. This inland expansion was also occurring in other areas of O‘ahu, as populations increased substantially, with the windward valleys being penetrated well before those on the leeward side of the island. In Kawailoa, the inland rockshelters were being utilized as a base to hunt birds and to make use of other stream and forest resources. The main population was still at the coast, however, as these rockshelters were not permanent habitation areas.

By the time of Kamehameha I in the late 1700s, land use intensified, with inland zones permanently settled, and animal husbandry taking place. Kamehameha’s occupation of the island in 1804 brought about significant social and economic changes in Kawailoa, as rockshelters were abandoned and people moved near irrigated terraces that produced large quantities of taro. This period of agricultural intensification was short-lived, however, and the upper Anahulu Valley was in decline as early as 1812. Possible causes of decline include a drop in population because of foreign disease epidemics, a new focus on obtaining sandalwood for foreign trade, and the abandonment of rural areas for growing urban centers, such as Honolulu.

After the collapse of the sandalwood trade ca. 1830, the Hawaiian economy shifted to catering to whaling vessels that would stop in the islands for provisions. Agricultural production was revived, as taro, yams, and sweet potatoes were cultivated for trade with whaling ships. Although the overall population of Waialua District decreased from out-migration as the whaling trade dwindled, it is clear that Kawailoa was well populated at the time of the Māhele, with 93 kuleana claims made for the ahupua‘a. Māhele data shows that a wide range of activities was taking place, from farming to fishing, and residential lots were interspersed among the farms and fishponds. The development of collective enclosures at ‘Uko‘a and Lokoea were found in the Māhele data. These enclosures were established as farmers joined together to keep their fields safe from the destruction caused by cattle. Furthermore, a good amount of Kawailoa’s taro patches was converted to rice fields since there was an increased demand for the staple.

The end of the 19th century saw even more far-reaching agricultural changes as the large-scale cultivation of sugarcane took hold of the Waialua District. This coincided with the extension of Benjamin Dillingham’s OR&L railroad system which came out of Wai‘anae, went around Ka‘ena, through Waialua, and to Kahuku. Dillingham’s Hale‘iwa Hotel, conveniently built where his Waialua terminal was located, drew tourism to Waialua Bay and the Hale‘iwa area. The hotel enjoyed a wealth of business until 1928 when it became a private club. During the years of the second world war it became an officer’s clubhouse, and in 1952, after the war, it was demolished and is now the site of a Hale‘iwa Joes restaurant (Hammatt et al. 2005).

The 20th century saw cattle ranching and sugarcane agriculture as the dominant activities in Waialua while taro and rice continued to be grown as well. The lands surrounding the project area were used as a dairy farm and by the Waialua Agricultural Company as a sugarcane plantation. These endeavors

were partly responsible for the rise in population during this era since laborers moved into the region for work.

Summary of Background Research

The moʻolelo and ʻōlelo noʻeau that perpetuate the memory of pre-contact Waialua and Kawailoa indicate the notable place they had in Hawaiian history. Kawailoa was and still is an ahupuaʻa within the district of Waialua, and both of these place names rightfully suggest the abundance of water in the region, evidenced by such geographical features as ʻUkoʻa Fishpond, Lokoea Fishpond, and Anahulu Stream. Indeed, later historical records document extensive well-watered lands to include vast freshwater ponds, taro and sweet potato fields, and swamplands. The significance of Waialua brought about by its bounteous agricultural and aquacultural production appears to be consistent with the many important heiau found throughout the district. This bounty gave rise to a substantial population dispersed among large villages.

Hawaiian language newspaper articles, old photos, and historic maps illustrate the development of Waialua into the post-contact era with references to bustling communities, churches, and schools. While Kamāmalu kept the ahupuaʻa of Kawailoa and Paʻalaʻa, her crown lands from Kamananui to Kaʻena were ceded to become government lands, and the ahupuaʻa would eventually support sugar plantations, cattle ranching, a railroad, dairy farming, and military enterprises.

No archaeological properties are documented for the project parcel, however many pre- and post-contact features have been identified nearby. Many of these sites are related to historic agricultural activities or the military. Two heiau recorded as partially or fully destroyed are located in the vicinity, and multiple human burials were encountered along the coast.

ETHNOGRAPHIC SURVEY

There are some things that cannot be found in the archives, in textbooks, or at the library. It is here, through the stories, knowledge and experiences of our kamaʻāina and kūpuna, that we are able to better understand the past and plan for our future. With the goal to identify and understand the importance of, and potential impacts to, traditional Hawaiian and/or historic cultural resources and traditional cultural practices of Kawailoa, ethnographic interviews were conducted with community members who are knowledgeable about the project area.

Methods

This cultural impact assessment was conducted in October and November 2020. Guiding documents for this work include The Hawaiʻi Environmental Council's Guidelines for Assessing Cultural Impacts, A Bill for Environmental Impact Statements, and Act 50 (State of Hawaiʻi). Personnel involved with this study are Windy McElroy, PhD, Principal Investigator of Keala Pono Archaeological Consulting and Maka Casson-Fisher, M.Ed, Ethnographer.

Interviewees were selected because they met one or more of the following criteria: 1) was referred by Keala Pono Archaeological Consulting or Element Environmental; 2) had/has ties to the project area or vicinity; 3) is a known Hawaiian cultural resource person; 4) is a known Hawaiian traditional practitioner; or 5) was referred by other cultural resource professionals. Three individuals participated in the current study. Manaʻo and ʻike shared during these interviews are included in this report.

Interviews were either recorded on the computer if held remotely or taped using a digital MP3 recorder if conducted in person. During the interviews, each person was provided with a map or aerial photograph of the subject property, the Agreement to Participate (Appendix A), and Consent Form (Appendix B), and briefed on the purpose of the cultural impact assessment. Research categories were addressed in the form of open questions which allowed the interviewee to answer in the manner that he/she was most comfortable. Follow-up questions were asked based on the interviewee's responses or to clarify what was said.

Transcription was completed by listening to recordings and typing what was said. A copy of the edited transcript was sent to each interviewee for review, along with the Transcript Release Form. The Transcript Release Form provided space for clarifications, corrections, additions, or deletions to the transcript, as well as an opportunity to address any objections to the release of the document (Appendix C). When the forms were returned, transcripts were corrected to reflect any changes made by the interviewee.

Several potential interviewees were contacted, resulting in three interviews (Table 3). The ethnographic analysis process consisted of examining each transcript and organizing information into research themes, or categories. Research topics include: connections to the project lands, moʻolelo, archaeological sites, gathering practices, change through time, and concerns and recommendations for the project. Edited transcripts are presented in Appendices D–F.

Interviewee Background

The following section includes background information for each interviewee, in their own words. This includes information on their ʻohana and where the interviewee was born and raised. The interviewees are Thomas Shirai, Emmaline Causey, and Jimmy Vasconcellos.

Table 3. List of Individuals Contacted

Name	Affiliation	Method of Contact	Result of Contact
Emmaline Causey	Longtime resident	Telephone, Email, In Person	Interviewed
Thomas Shirai	Longtime resident, former OHA Native Hawaiian Historic Preservation Council member, former Oʻahu Burial Council member, and former Kaʻena Point advisory cultural representative	Telephone, Email, Zoom	Interviewed
Jimmy Vasconcellos	Longtime resident	Telephone, Email, In Person	Interviewed

Emmaline Causey

> Ok, my name is Emmaline M. Causey and I reside [in Kawailoa] and I am very happy to participate in this interview…Well, my dad is the Plimmer family from Haleʻiwa, my mom is a Souza girl from Thompson Corner…dad had four other siblings in his family. My mom came from a family of 12 children. My grandparents were Achiu and the Souza family. So, my grandfather is Jacinthe and he came from Portugal, Madeira.

Thomas Shirai

> …My name is Thomas T. Shirai Junior. I'm Hawaiian, Chinese, I'm…half Japanese, one third Hawaiian, one eighth Chinese. That's my ethnicity…My father is Thomas Shirai. He is pure Japanese. From the Big Island of Hawaiʻi in Papaiko. My mom, Laverne Keao, she's the daughter of David and Abigail Keao. And she was born in Waialua, one piko family of Waialua. I'm an only child. I was born in 1961. I was born at Kapiʻolani Hospital. Ok, the first day after my birth…my mom and I went to live with my mom's parents, David and Abigail Keao in Mokulēʻia because my father had tuberculosis. And he was ill, so they sent him to Leahi Hospital by Diamond Head. So, from an infant age, until my father got well, I resided with my grandparents in Mokulēʻia and my Mom.

Jimmy Vasconcellos

> …Well first of all I was born 1953. I am 67 years old, now born and raised in the Waialua, Kawailoa area. I went to school at St. Michael's and graduated from high school… Plantation used the pump to irrigate all their cane fields and in the back of that, there was three houses. One of them was a house that I grew up in. We moved…after I believe I was 5, maybe 4, 5 years old, we moved up the street, which is in the same area, but just another house above the cane road, which is just above the rubbish dump area…I used to work for City and County. I was a refuse collector and those days we used to just dump the rubbish and they used to flatten it out with the bulldozers and then used to bury it with dirt. And after I left, to continue my career in the C&C, they had built a transfer station.

Topical Breakouts

The following sections are extended quotations from the interviews, organized by topic. Interviewees provided information on connections to the project lands, moʻolelo, archaeological sites, gathering practices, change through time, and concerns and recommendations for the proposed Kawailoa Transfer Station Improvements project.

Connections to the Project Area

Well, my grandfather - Portuguese came from Maui, I guess and was working at the Waialua Sugar Company, til he retired. My dad was working in town and he got his job at the Meadow Gold dairies at Kawailoa. We lived in the Kawailoa area when I was born up until, the 4th–5th grade; then we moved to Waialua. My grandfather had his farm, he had a taro and hasu lo‘i and his cattle ranch and a farm. His property that he was leasing started from behind Jameson’s - Loko Ea. All the way Kam Highway all the way to Kawailoa Road up in the back where the rubbish dump is now, behind the dairy all the way to Ashley Road. So he had all that area with his cattle and the lo‘i was at ‘Uko‘a - swamp area. [Jimmy Vasconcellos]

I believe that was part of the lease that my grandfather had. ‘Cause I remember going in there and there was a gate - it was a cattle guard where the cows and cattle couldn’t cross. And I believe my grandfather had some cattle back there. [Jimmy Vasconcellos]

So that was, part of the rubbish dump now - the landfill area, was part of my grandfather’s ranch [John Vasconcellos], but the city, I guess the city took over that area a long time ago when they started taking the refuse there from the refuse trucks and the community. I remember the road, the entryway there was a cattle guard so I knew had cattle in there before, but ever since then, it’s been years. I mean, probably in the late and the early ‘60s was taken over by the city. [Jimmy Vasconcellos]

Kawailoa has a very special meaning, like many places in Waialua. And so the Kawailoa history starts with the family - branch of the family - ‘Olopana. Part of the family…The Latter Day Saints had a marriage record, you know. That shows one of my grandpa's kupuna, way before he was born in the 1850s (or 1830s), a man named Pila ‘Olapana married into our family. So that's one of the connections, yea from that. And so the land transferred - all of it is a domino effect, you know. ‘Olopana, and that's how my relationship over there through genealogy, in the land and all that. [Thomas Shirai]

Also inquired with the National Archives because my grandfather was an employee of Public Works. You know, the GSA and all that stuff, the public works for Pearl Harbor, so they have all these records, you know, like his resumes, work record and all that, and it shows what his accomplishments were. Well, low and behold, get one section I saw that they gave me. Had a page that has his job resume and part of that resume, he built all the structures for Meadow Gold Dairy. All the cattle pens, the homes and all that for Meadow Gold Dairy. Yeah, he built them all, and some of them is still existing today. [Thomas Shirai]

Well, the reason I got involved in this is that when I was growing up... And this is the story I got from my mom. My grandfather had this whole marsh. From Kawailoa Road all the way to the Beach House (Restaurant). He had the lease, I guess it's from Kam School. [Emmaline Causey]

So - but the piggery, I didn't mind the piggery because my father had a piggery over there in Loko Ea…I came to the ranch (next to ‘Uko‘a Pond) in ’83…Yeah, He changed - we changed everything when we got married. Yeah, he put everything under my name. Because he had 8 children and I told him, you know what, they're not around to help you. You want to marry me? Well then you put the ranch under me, because if something happens to you, then I have something to lean on. And so he did it. [Emmaline Causey]

And when he came to Hawai‘i [her grandfather], he became the manager. I mean, the chauffeur for Waialua Sugar - for the manager, yeah. And he resided at Thompson Corner, and at that time…the manager had the whole area of Midkiff Acres. [Emmaline Causey]

…Ok - Kawailoa Camp because I had my mother's family, some of them live up there. So we always had reason to go up there, but then pretty soon, the gym, the swimming pool, which was run by Waialua Sugar. And there was a plantation store, which was all wooden, the kine - wooden, just like 2x4s and whatever on the, you know, not, not glass - I mean, tile or all that. No, it was just an old store. But they had the best food. [chuckles at the memories] So we spent, my family spent a lot of time up there, cause we had a lot of relatives that belong to the Plimmers and the Souzas and whatevah... [Emmaline Causey]

Moʻolelo

So that's why and for my grandfather, but he as a child, he used to go - a big part of it was ʻUkoʻa Pond. ʻUkoʻa Pond you know, they go, and they always knew and they always acknowledge Laniwahine. They always did that - they no call em ʻUkoʻa Pond, they call em Laniwahine. They acknowledge the deity. Yeah, you know, there's kapu fish in there- you not supposed to take em. And that's in the *Sites of Oʻahu* and all that, but he remembers he used to go over there, you know, when they go catch fish, they go and cut bulrushes because the thing make sticks and then they string em up, string em up - use that for the kui. And they sell em or they take em home for care after they go dive. Things like that. [Thomas Shirai]

I was too young to go swimming in the water hole, but they had the high school kids and teenagers would go swimming, would be swimming in one of the big wells that was connected to the water pump station. Supposedly the story was that - that hole was there from before time. It wasn't man-made. And was supposedly connected to the sea, the ocean, which is about less than a mile away. And that's where the—now this is a story that I heard from when I was growing up. I don't know if it's true or not, but they say that's where the shark god would come in and pick up his sacrifices there. [Jimmy Vasconcellos]

Archaeological Sites

Oh they get one heiau some place over there. And get graveyards too back here. [Emmaline Causey]

Yeah, and then the pumphouse of course the pumphouse is here and even till today, I still have people that want to go swim over there… And so I mean I try some of them come to my house and ask "Can we go swim in the marsh and the pumphouse?" They really remember that - I don't know, I never did go swim in there…[Emmaline Causey]

Everybody in that camp looked out for everybody and they must have had, I don't know, maybe 50 to 100 houses up there - old plantation houses. Before they tore it down, which was several years ago. They got rid of all the houses that had just been renovated. [Emmaline Causey]

Up at Kawailoa Camp, was a Japanese church up there. And right next door was a, you know, mix religion and all the different things that they had in the church. They just went up there and they bulldozed everything. All the houses and some of them had just been fixed. Yeah, you know, and now you go up there, it's all vegetation. [Emmaline Causey]

But as far as in here...because I have a graveyard on the property. Which sits back - There's a Japanese graveyard, but they had for years and years and years, they had the same guy taking care of the graveyard, like when it's a holiday and when it's clean up time. The Japanese church from Waialua, they used to come and clean. And then after they get through, they go right up here to this one, to this graveyard and clean all that. Because through marriage, the person that was, was a gung-ho person about cleaning these two graveyards - he's related to me, but not with blood, but he's related. His aunty is my aunty.

But in the last five, six years, he had pass away because he had cancer. Cause now, nobody cleans the graveyard. [Emmaline Causey]

…[I] heard the stories from other people that that was a fishing village, a gathering fishing village, but was most basically was made for the visitors from Kauaʻi, that coming over to Oʻahu and stay. And they have a place to stay when they visit and then return to Kauaʻi. That [story] I got from one of my classmates, Leif Anderson, who is also a Haleʻiwa resident and his parents and grandparents, as was, has lived in Haleʻiwa for many, many years. [Jimmy Vasconcellos]

It's just I know, I know that my grandfather found some Hawaiian artifacts like - poi board, poi pounders, I guess you'd call it ʻulu maika, and what is that other one ... the one that looked like the torpedo?...Oh, yeah, he found some of those [moa paheʻe] that was somewhere between Kawailoa Drive and Haleʻiwa Beach Park - somewhere in that area. Supposedly, what I heard was an old fishing Hawaiian village in that area. So maybe the artifacts that was located, well found, by my grandfather was from that village and I know that he had given or donated most of his findings to the Bishop Museum. Some went to the dentist in Wahiawa—couple poi pounders. And I think my aunty, one of my aunties in Nuʻuanu, had acquired a poi pounder of my grandfather. [Jimmy Vasconcellos]

And throughout the pasture areas, there were stone walls that was made, I don't know by who, but the stone walls was run from mauka to makai, as far as I remember. It was probably just land divisions that they had from before. [Jimmy Vasconcellos]

No, I don't recall any heiau(s), but there was a rock pile, I believe probably was plantation. But there was no cane fields in the area, so I don't know why the plantation would pile up rocks. That would be right next, off of Kawailoa Road, above the transfer station and alongside of the big water pipe that used to have coming down from Kawailoa to the water pump across the landfill area that had the water pump station. [Jimmy Vasconcellos]

And he said - that's why get all the subterranean springs over there …With Emma's brother "Boy Plimmer" he used to take us during the summers when he got a pump. The plantation had a pump over there. [Thomas Shirai]

Kawailoa camp is closed, of course, because no more the plantation. You know and still get the graveyard, but some of them went up there and they exhumed and had em reburied at Mililani Cemetery for safekeeping purposes. And we were afraid, we don't want that type of development over there. [Thomas Shirai]

We understand you like make the bypass road because of that situation over there. …That whole place is one traditional cultural landscape. I think, from over there go all the way up to, you know, the bluff at Waimea over there. I forget the name of the heiau, I cannot think of the name right now...All I can remember is Keahi o Hapuʻu (on the ocean side) but get the heiau in the back over there - Kamehameha School property. But all of that, all Kahokuwelowelo - that's all the landscape for the whole place. [Thomas Shirai]

The other Kawailoa history, that I can share is - it's recorded already in, in your company's EIS - for another project I think it's for another project, you gotta go check the Keala Pono library. It has the Site 235 - by the Haleʻiwa, original Haleʻiwa Beach Park. All that area over there is part of Kawailoa – Puaʻena. So, it has the only existing picture of Site 235, the stone, the Puaʻena Stone and I believe it's still there. It's just hiding - kolohe the stone – when it doesn't want to be found - it hides itself. [Thomas Shirai]

But that, my main manaʻo is over there [Aunty Emmaline's property] - that was a potential area where we believe Kapukapuakea Heiau is situated in the depth of the sites. Cause of

> all the sites, we believe substantiates what my manaʻo is about how I feel about that property. [Thomas Shirai]

In addition to the information provided in the quotes above, Thomas Shirai also shared photos of archaeological sites in the ʻUkoʻa Pond vicinity. A selection of photos is presented below.

Figure 13. Rock wall in the ʻUkoʻa Pond vicinity (courtesy of Thomas Shirai).

Figure 14. Altar in the ʻUkoʻa Pond vicinity (courtesy of Thomas Shirai).

Figure 15. Bell stone in the ‘Uko‘a Pond vicinity (courtesy of Thomas Shirai).

Gathering Practices

…He used to go over there, you know, when they go catch fish, they go and cut bulrushes because the thing make sticks and then they string em up, string em up - use that for the kui. And they sell em or they take em home for care after they go dive. Things like that. [Thomas Shirai]

At the bottom get prawns, Malaysian prawns, so we used to go dive and (poke em up), and pick em up, catch em and boil em and grind yeah. That was a treasure for all of us to go down, a treat, to go dive you know go swim, especially on these kinds of hot days like these. He would load us all up in his Volkswagen, get about ten of us in one Volkswagen [laughs at the memory]. But we go and that's one of the things that we did. [Thomas Shirai]

But there's also a picture of Laniakea that the Bishop Museum has, that I have. It has to do with a hukilau. They did a hukilau there and it shows them not actually surrounding but the fish that they caught and they show some of the people that was at the hukilau. [Thomas Shirai]

…What we used to do in the area was, like I said, my grandfather used to farm the lo‘i - hasu and taro, cattle ranch and we used to also go fishing in the swamp areas where they had some tilapia and crayfish. [Jimmy Vasconcellos]

Change Through Time

Well, the area that I know of, didn’t change very much. It’s just that the transfer station is still there. I used to work for City and County. I was a refuse collector and those days we used to just dump the rubbish and they used to flatten it out with the bulldozers and then used to bury it with dirt. And after I left, to continue my career in the C&C, they had built a transfer station. And that’s what they have now, just a transfer station, and then as far as the, there was a Kawailoa town. A plantation town back in the, when the plantation was in full swing. Now they went back to the original property, I mean, the landowners and they

got rid of the town that was up there, the Kawailoa town. There was a Buddhist church, Catholic church, a gym, movie theater, swimming pool, stores, a public school. I think the public school was up to 6th grade, I believe… And the houses were for the plantation—the plantation workers. It was a, kind of, thriving community with its own store and movie theater. [Jimmy Vasconcellos]

Kawailoa Camp? Cause we went summer fun when we were young. Summer fun was up there sometimes the other half of the time - because my parents both worked. So they put us in this summer fun program. And then...Well, anyway we went up to summer fun at Kawailoa Camp. And that's where, that's where we spent our days was summer fun. And, you know, they had all kind of activities. And, you know, it wasn't as dangerous as it is today. Yeah. With going to those kinds of places to just walk around, walk around. But now it's all locked up, get gates, can't go up there. [Emmaline Causey]

And then when they decided to put Monsanto up there and do agriculture and other people doing agriculture, it's, it's not the same. So pretty soon the "Great Wall of China" goes [up], cannot go with car and you cannot do nothing. So, it must be 20 years I haven't gone mauka. [Emmaline Causey]

Yeah, it's not like before. But I still have people that come, wanna know where the pool is, the one to swim in. [Emmaline Causey]

But when the plantation, for liability, when they closed up [the swimming hole], they demolished some of it and they filled up the hole. But you can see - you can see traces of places, you can see where the water is still coming up, and that's fresh water, you can actually drink the water. That's how cold and fresh and pure it is. [Thomas Shirai]

You know, but before that transfer station over there, that used to be just one regular landfill. You know, big time - was a big landfill, just a miniature Kailua landfill. [Thomas Shirai]

You remember before, maybe they still had em, you know, before you turned - coming from Haleʻiwa, you turned to go to the transfer station, that area, the pine trees and stuff you remember used to get the carnival over there - the carnival rides. Merry go round, horse ride, all that kine over there... [Thomas Shirai]

Concerns and Recommendations

You know, the traffic is bad. Yeah, the traffic, whatever it is we got to deal with it, because it's, it's about to happen. Right now, I cannot think of any, any concerns, I mean, as far as, you know, the transfer station is a concern... [Emmaline Causey]

Oh, definitely - yeah I think it's a great thing. Ok, sure. It needs to be changed, you know. I mean, before we had to drive up there in the dusty road and dump everything on the ground so that ground is compacted with a whole lot of stuff, you know. So and where they put the washing machines and the dryers and of old stuff. Oh they have to do something. They've got to...We should be entitled to that because all my years here, they haven't done anything. But I remember way back from about going up there and throwing it on the ground. So I think it's a great thing. Yeah. [Emmaline Causey]

I think there should be some concern of this transfer station now, because sometimes when I go up there, I say oh my god - this transfer station has to change cause one of these days we going loose somebody in that dump, because, you know, they allow anybody, the kids, whatever, flinging the rubbish - what if they go in too? [Emmaline Causey]

The main concern that we saw, that we recognized - that when they made the landfill and stuff like that, the water pilau already - cause the seepages, never have such things as

> [linings] and all those things and the EIS never have that or the environmental laws that they have today. So, you know, one of the things going be - high content of lead. So which means the fish is pilau - no can eat em already, you only going catch em for a trophy, that's all. [Thomas Shirai]

> I support it….No need pitch to me, it's needed because it's going to benefit the property. Not because they have to build - if they have to go through the EIS process and go with all this, you know, just have to be mindful and careful and when building in that area. That's how I feel, as a whole. [Thomas Shirai]

> If it's in the same footprint as the landfill now, I don't think it'll affect anything right now because I know for sure that the—well, not for sure. But as far as I can recall, there was no other buildings or any other artifacts that my grandfather found in that area. And as far as the restrooms or anything like that, right now, the area is on a swamp area. So I know they cannot make a cesspool or septic tank. They have to make a regular tank that would have to be transferred to another sewer system. [Jimmy Vasconcellos]

> As it is right now, if they—if it's in the same footprint, then I can't see any impact right now. Unless they find something else in the area. [Jimmy Vasconcellos]

> Well, before anything is approved by the state or city, we should, we should make a study of the area first. You know, get as much information from people that know the area, which is getting less and less now, because many of the old timers are not with us anymore. [Jimmy Vasconcellos]

Summary of Ethnographic Survey

The interviewees have extensive knowledge of Kawailoa and the area surrounding the transfer station. All three interviewees are longtime residents of the region, with one consultant having grown up less than a mile from the project area and another currently living across from Kawailoa Drive.

Several moʻolelo were shared about the project vicinity including stories associated with ʻUkoʻa Pond such as the deity Laniwahine, another about a swimming hole that connected to the ocean. Whereas the interviewees did not mention any traditional gathering practices occurring in the specific project area, they did note gathering bullrushes and catching fish and prawns in ʻUkoʻa Pond as well as hukilau down at the shore. Many archaeological sites were also shared for the region. Archaeological sites mentioned in the vicinity include the former Kawailoa Camp, a pumphouse, a fishing village, a heiau, a stone wall, a stone mound, ʻUkoʻa Pond, and various cemeteries. One consultant noted that his grandfather collected multiple traditional artifacts from the area near the pond and possibly also the study lands. These included poi boards, poi pounders, ʻulu maika, and moa paheʻe.

The interviewees also voiced their concerns and recommendations for the project. Overall, consultants viewed the project positively and support improvements to the transfer station. One interviewee even said that the upgrades and improvements were necessary and long awaited. Participants did not think that the project would affect any cultural sites or gathering practices. A concern was raised about the potential long term effects of the closed landfill with respect to shallow groundwater quality and environmental conditions. One consultant recommended that more interviews should be conducted to gather additional information from kūpuna that grew up in the area since they are getting older.

SUMMARY AND RECOMMENDATIONS

The Kawailoa region has been an important area of Oʻahu since pre-contact times and has retained its importance today, particularly for agriculture and ranching. The Waialua District was well populated in ancient times, with taro farmed in wet areas, and multiple fishponds located in the district. The region was tied to royalty known as the Poʻe Lō Aliʻi, who were chosen as aliʻi nui and for royal marriages. The historic period brought other changes to the area, with large tracts of land converted to cattle ranches, dairy farms, and sugarcane and rice fields.

This study highlights the unique history of Kawailoa and demonstrates the importance of this place to the community. Three community members were interviewed to share their manaʻo and to help identify any potential cultural resources or practices that might be affected by the proposed project at the Kawailoa Transfer Station.

Cultural Resources, Practices, and Beliefs Identified

Archival research and ethnographic interviews compiled for the current study revealed that Kawailoa was a culturally significant area with many of the natural resources which supported traditional subsistence activities. In the project area, this would have centered on the ʻUkoʻa and Lokoea Fishponds, taro farming, and the harvesting of marine resources. In the historic period, activity was focused on the construction of the railroad, ranching, dairy farming, and agriculture.

The interviewees mentioned a few cultural practices or gathering that are carried out near the project area. At ʻUkoʻa Pond, bullrushes were collected for kui, and fish and prawns were harvested. At Laniakea Beach, traditional hukilau were known to occur. The archaeological sites discussed during the interviews include a heiau, a healing stone, a historic pump, a cemetery, the former Kawailoa Camp, a fishing village, a rock wall, a rock mound, and the two fishponds. No sites were mentioned as being located within the project area itself, however it was noted that traditional artifacts may have been found within and around the study lands.

Potential Effects of the Proposed Project

The interviewees were all in agreement that the proposed project would not affect any places of cultural significance if the work was done properly and within the footprint of the existing landfill and transfer station.

Confidential Information Withheld

During the course of researching the present report and conducting the ethnographic survey program, sensitive or confidential information was revealed, as one interviewee asked to speak off the record. This confidential information was withheld from the current report.

Conflicting Information

No conflicting information was obvious in analyzing the gathered sources. On the contrary, a number of themes were repeated and information was generally confirmed by independent sources.

Recommendations/Mitigations

One interviewee stated that the transfer station itself is a safety concern and that the upgrade is necessary. Another interviewee mentioned the environmental impacts of the landfill, which has already leaked chemicals such as lead into the soil and water. Interviewing as many kūpuna as possible to record the oral history of Kawailoa was a recommendation by one consultant.

Summary and Conclusion

In sum, background research and oral history interviews identified several archaeological resources in the vicinity of the project area. Whereas the project area has been previously disturbed, it is not likely that vestiges of pre-contact archaeological sites remain on the surface. Likewise, because the area has been used as a dump for many years, pre-contact subsurface archaeological remains are not likely. The community should be kept informed on the improvement plans, and their concerns and recommendations should be considered during all phases of the proposed work.

GLOSSARY

ahupua‘a	Traditional Hawaiian land division usually extending from the uplands to the sea.
aka‘akai	The bullrush *Scirpus validus* found in brackish or fresh water marshes. These plants were traditionally used in house thatching or woven into mats for beds.
ali‘i	Chief, chiefess, monarch.
ali‘i nui	High chief.
‘anae	Full-sized ‘ama‘ama mullet fish.
‘āpana	Piece, slice, section, part, land segment, lot, district.
awa	The milkfish, or *Chanos chanos*, often raised in fishponds in ancient times.
hasu	The lotus root, or renkon, used in Japanese cuisine.
heiau	Place of worship and ritual in traditional Hawai‘i.
hukilau	A net for fishing; to fish with a net.
‘ike	To see, know, feel; knowledge, awareness, understanding.
imu	Underground pit or oven used for cooking.
‘iwa	The frigate bird *Fregata minor palmerstoni*.
iwi	Bone.
kahu	Honored attendant, guardian, nurse, keeper, administrator, pastor.
kahuna	An expert in any profession, often referring to a priest, sorcerer, or magician.
kapa	Tapa cloth.
kapu	Taboo, prohibited, forbidden.
kia‘i	Guard, caretaker; to watch or guard; to overlook, as a bluff.
kolohe	Mischievous, unethical, naughty; rascal, prankster, vandal; to misbehave or cheat.
kama‘āina	Native-born.
koa	*Acacia koa*, the largest of the native forest trees, prized for its wood, traditionally fashioned into canoes, surfboards, and calabashes.
konohiki	The overseer of an ahupua‘a ranked below a chief; land or fishing rights under control of the konohiki; such rights are sometimes called konohiki rights.
kōlea	The Pacific golden plover *Pluvalis dominica*, a bird that migrates to Hawai‘i in the summer; the native trees and shrubs *Myrsine*, the sap and charcoal of which were used as a dye, the wood used for houses and for beating kapa.
kuahiwi	Mountain or high hill.
ku‘i	To pound, punch, beat out , hammer; to stitch, join, or connect.
kuleana	Right, title, property, portion, responsibility, jurisdiction, authority, interest, claim, ownership.
kūmū	The adult goatfish *Parupeneus porphyreus*.

kupuna	Grandparent, ancestor; kūpuna is the plural form.
limu	Refers to all sea plants, such as algae and edible seaweed.
lo‘i, lo‘i kalo	An irrigated terrace or set of terraces for the cultivation of taro.
loko	Inside, interior. Pond, lake, pool.
luakini	Large heiau of human sacrifice.
Māhele	The 1848 division of land.
mākāhā	A fish pond sluice gate.
ma kai	Toward the sea.
malo	Male’s loincloth.
mana‘o	Thoughts, opinions, ideas.
ma uka	Inland, upland, toward the mountain.
mele	Song, chant, or poem.
moa pahe‘e	A traditional sport or game called which involved the throwing of a short, blunt dart or javelin called a moa.
moku	District, island.
mo‘o	Lizard, dragon, water spirit.
mo‘olelo	A story, myth, history, tradition, legend, or record.
‘ōlelo no‘eau	Proverb, wise saying, traditional saying.
‘ohana	Family.
oli	Chant.
poi	A staple of traditional Hawai‘i, made of cooked and pounded taro mixed with water to form a paste.
pu‘uone	Pond near the seashore, as at the end of a stream.
‘uala	The sweet potato, or *Ipomoea batatas*, a Polynesian introduction.
‘ulu maika	Stone used in the maika game, similar to bowling.
weke	Certain species of the *Mullidae*, surmullets or goatfish, traditionally used as offerings to counteract curses.

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APPENDIX A: AGREEMENT TO PARTICIPATE

Agreement to Participate in the Cultural Impact Assessment for the Kawailoa Transfer Station Improvements Project
Maka Casson-Fisher, Ethnographer, Keala Pono Archaeological Consulting

You are invited to participate in a Cultural Impact Assessment (CIA) for the Kawailoa Transfer Station Project in Kawailoa, on the island of Oʻahu (herein referred to as "the Project"). The Assessment is being conducted by Keala Pono Archaeological Consulting (Keala Pono), a cultural resource management firm, on behalf of Element Environmental LLC. The ethnographer will explain the purpose of the Assessment, the procedures that will be followed, and the potential benefits and risks of participating. A brief description of the Assessment is written below. Feel free to ask the ethnographer questions if the procedures need further clarification. If you decide to participate, please sign the attached Consent Form. A copy of this form will be provided for you to keep.

Description of the Project

This CIA is being conducted to collect information about the Property in the Kawailoa area in Waialua on Oʻahu Island through interviews with individuals who are knowledgeable about this area, and/or about information including (but not limited to) cultural practices and beliefs, moʻolelo, mele, or oli associated with this area. The goal of this Assessment is to identify and understand the importance of any traditional Hawaiian and/or historic cultural resources, or traditional cultural practices within the Project area. This Assessment will also attempt to identify any effects that the proposed development may have on cultural resources present, or once present within the Property area.

Procedures

After agreeing to participate in the Project and signing the Consent Form, the ethnographer will digitally record your interview and it may be transcribed in part or in full. The transcript may be sent to you for editing and final approval. Data from the interview will be used as part of the ethno-historical report for this project and transcripts may be included in part or in full as an appendix to the report. The ethnographer may take notes and photographs and ask you to spell out names or unfamiliar words.

Discomforts and Risks

Possible risks and/or discomforts resulting from participation in this Project may include, but are not limited to the following: being interviewed and recorded; having to speak loudly for the recorder; providing information for reports which may be used in the future as a public reference; your uncompensated dedication of time; possible misunderstanding in the transcribing of information; loss of privacy; and worry that your comments may not be understood in the same way you understand them. It is not possible to identify all potential risks, although reasonable safeguards have been taken to minimize them.

Benefits

This Project will give you the opportunity to express your thoughts and opinions and share your knowledge, which will be considered, shared, and documented for future generations. Your sharing of knowledge may be instrumental in the preservation of cultural resources, practices, and information.

Confidentiality

Your rights of privacy, confidentiality and/or anonymity will be protected upon request. You may request, for example, that your name and/or sex not be mentioned in Project material, such as in written notes, on tape, and in reports; or you may request that some of the information you provide remain off-the-record and not be recorded in any way. To ensure protection of your privacy, confidentiality and/or anonymity, you should immediately inform the ethnographer of your requests. The ethnographer will ask you to specify the method of protection, and note it on the attached Consent Form.

Refusal/Withdrawal

At any time during the interview process, you may choose to not participate any further and ask the ethnographer for the tape and/or notes. If the transcription of your interview is to be included in the report, you will be given an opportunity to review your transcript, and to revise or delete any part of the interview.

APPENDIX B: CONSENT FORM

Consent Form

I, _____, am a participant in the Cultural Impact Assessment for the Kawailoa Transfer Station Improvements Project (herein referred to as "Project"). I understand that the purpose of the Project is to conduct oral history interviews with individuals knowledgeable about the subject property and surrounding area of Kawailoa on O'ahu Island. I understand that Keala Pono Archaeological Consulting and/or Element Environmental LLC. will retain the product of my participation (digital recording, transcripts of interviews, etc.) as part of their permanent collection and that the materials may be used for scholarly, educational, land management, and other purposes.

_____ I hereby grant to Keala Pono and Element Environmental LLC ownership of the physical property delivered to the institution and the right to use the property that is the product of my participation (e.g., my interview, photographs, and written materials) as stated above. By giving permission, I understand that I do not give up any copyright or performance rights that I may hold.

_____ I also grant to Keala Pono and Element Environmental LLC my consent for any photographs provided by me or taken of me in the course of my participation in the Project to be used, published, and copied by Keala Pono and Element Environmental LLC and its assignees in any medium for purposes of the Project.

_____ I agree that Keala Pono and Element Environmental LLC may use my name, photographic image, biographical information, statements, and voice reproduction for this Project without further approval on my part.

_____ If transcriptions are to be included in the report, I understand that I will have the opportunity to review my transcripts to ensure that they accurately depict what I meant to convey. I also understand that if I do not return the revised transcripts after two weeks from the date of receipt, my signature below will indicate my release of information for the draft report, although I will still have the opportunity to make revisions during the draft review process.

By signing this permission form, I am acknowledging that I have been informed about the purpose of this Project, the procedure, how the data will be gathered, and how the data will be analyzed. I understand that my participation is strictly voluntary, and that I may withdraw from participation at any time without consequence.

_____

Consultant Signature **Date**

_____

Print Name **Phone**

_____

Address

Thank you for participating in this valuable study.

APPENDIX C: TRANSCRIPT RELEASE

Transcript Release

I, _____, am a participant in the Cultural Impact Assessment for the Kawailoa Transfer Station Improvements Project (herein referred to as "Project") and was interviewed for the Project. I have reviewed the transcripts of the interview and agree that the transcript is complete and accurate except for those matters delineated below under the heading "CLARIFICATION, CORRECTIONS, ADDITIONS, DELETIONS."

I agree that Keala Pono Archaeological Consulting and/or Element Environmental LLC may use and release my identity, biographical information, and other interview information, for the purpose of including such information in a report to be made public, subject to my specific objections, to release as set forth below under the heading "OBJECTIONS TO RELEASE OF INTERVIEW MATERIALS."

CLARIFICATION, CORRECTIONS, ADDITIONS, DELETIONS:

OBJECTIONS TO RELEASE OF INTERVIEW MATERIALS:

_____

Consultant Signature **Date**

_____

Print Name **Phone**

_____

Address

APPENDIX D: INTERVIEW WITH EMMALINE CAUSEY

TALKING STORY WITH

EMMALINE CAUSEY (EC)

Oral History for the Kawailoa Transfer Station project by Maka Casson-Fisher (MCF)
For Keala Pono 10/17/2020 at 1:41 PM

MCF: So today is October 17th. We're here at Kawailoa, Aunty Emmaline Causey's house. My name is Maka Casson-Fisher. It is 1:41 p.m. and she has signed the consent form. And I have explained to her the reason for this interview. So, to start off, can you please tell us about yourself, your name, where you're from, where you're born, where you grew up and where you went to school?

EC: Ok, my name is Emmaline M. Causey and I reside [in Kawailoa] and I am very happy to participate in this interview. And whatever questions I can answer, then you can ask me the questions.

MCF: Ok, Mahalo Aunty Emmaline. Could you tell us about your ʻohana or family background?

EC: It's going take forever (both laughs) Well, my dad is the Plimmer family from Haleʻiwa, my mom is a Souza girl from Thompson Corner…dad had four other siblings in his family. My mom came from a family of 12 children. My grandparents were Achiu and the Souza family. So, my grandfather is Jacinthe and he came from Portugal, Madeira. And when he came to Hawaiʻi, he became the manager. I mean, the chauffeur for Waialua Sugar - for the manager, yeah. And he resided at Thompson Corner, and at that time…the manager had the whole area of Midkiff Acres. That's where the manager's house was, that whole thing. And if you go up towards - from Thompson Corner, you're going to Wahiawa and Honolulu; there's two pillars over there. And that was the driveway to get to the manager's house. And my dad and my grandpa lived at Thompson Corner. So, whenever the manager needed him, which this was his... This was his thing with being the chauffeur for him, he would get up in the morning, have breakfast, then he would wait for the call for the manager to be picked up and he would take him to Waialua Sugar office and work in the morning. Then lunchtime go back to the company, pick up the manager, take him to his house for lunch and then, of course, you know, he left him there and then after a certain while he went back to pick him up. And then in the afternoon when you got through work, I guess it was about 4 o'clock. And he would - my grandfather - would leave and go down to Waialua Sugar, pick the manager up and take him home for the day. So that's what he did. And he also was a jockey, my grandfather. And of course, my mom came from a family of 12. She had five sisters and herself and six brothers. So, they had a big family. So, and my grandmother was just, she was a schoolteacher. And she - she actually used to walk from Thompson Corner, and I guess the shortcut was at that time was go through Kamaloa Road. And she taught at Haleʻiwa Elementary.

MCF: Oh.

EC: Yeah. And then in the afternoon then I guess my grandfather went to pick her up. But because his schedule, she walked a lot of times and then, of course, right around the manager's / my grandfather's house is still there and I think the Miners are inside there. Yeah, but that house, it's about the same, you know, but they made a lot of repairs. And then the one above, there was a house above and my sister, my mother's sister and her husband, they lived right next to my grandpa. And in the lower part, right at the corner is my mother's brother and his wife and all their kids, their family. Then you get another house down here, and she / he also worked for the plantation too. So that's why they call that Thompson Corner or Souza Corner. And so anyway, we.... And of course, we were in Haleʻiwa cause we lived where my brother - you know where my brother Clem lives - my mom's house, ok? My brother lives in there now, Clem. And so growing up my parents built the house that was there, in fact, that was my father's property, so they built the house that is there today and then just about a year and a half ago, my brother did a lot of renovations. My dad wasn't able to do it.

And so in the meantime, there's seven of us at home and she (my mom) was a telephone operator and she worked for years and years at Seaview Inn, you know where Haleʻiwa Joe's is? I worked at Haleʻiwa Joe's and my dad played music at Haleʻiwa Joe's but starting from when there was the Haleʻiwa Hotel over there. And then my father's brother, I mean, at the moment he was the bartender at Haleʻiwa Joe's and we were all, all involved, I was there with all of them at one time or other. And so Haleʻiwa Joe's is still partial to me. And so anyway, that's about it.

MCF: Ok, well, that's some background and some of your family...

EC: And if you need to know more, you can always call me. No matter I stay town, whatever, you just call my phone - I answer, I know your number that's why.

MCF: So what's your association to the project? Property, family, land, work, et cetera?

EC: Well, the reason I got involved in this is that when I was growing up... And this is the story I got from my mom. My grandfather had this whole marsh. From Kawailoa Road all the way to the Beach House. He had the lease, I guess it's from Kam School. So on weekends, my mother and her sister, the two younger sisters - they always rode with my grandfather in a boat, in a dinghy or boat, or whatever they had, and he would bring them all the way up to Loko Ea area. So when I came with my husband that passed away, I kind of was interested in digging up whatever, you know. So I sat with my two - my mom and my aunty, you know, one day when they were alive, whatever I could find out from them, yeah. And so that's the background of me over here, is because of my grandfather. You know, it was really something.

MCF: And so was it through your grandfather that you acquired special knowledge of this area?

EC: No, actually, I came here because of my husband.

MCF: Ok.

EC: See, he had the lease for - if he was living today, he'd probably have the lease. I knew of him way back when my father had the piggery, you know, on the - off the bypass. But we always used to pass by and see each other on the road and then coming up by Loko Ea, he had to get to feed his cattle through that, through that gate right there. And then had the egg farm (mentions name of the family) egg farm. And so he used to converse with my father.

So a couple of times I was there and he told my father, he said, you know, you sure have a beautiful daughter, you sure have a beautiful daughter, you know, because I was young then, right? And it's amazing how she, she helps you with the piggery. I mean, I didn't never care if I got dirty working pigs. I mean, you know, was just one of those things we do. Yeah, and so we spent a lot of time over, you know, my brothers, my sister that passed away, she was always miss prim and prom, you know. No - don't wanna feed the pig, don't wanna wash the doodoo down the cesspool and all that, yea she never did nothing like that. And then my youngest sister, she lives on Kona on the Big Island. She, she - because she was not with us, I mean, and she got married and she never did do all that. So, that's how I got here. And then after a little while and I got talking to him and then he, what did he do? Oh, yeah, and he - I was working on a Seaview Inn, so my husband always came in, Seaview Inn with his drinking people and they local people from Waialua / Haleʻiwa. So naturally, I know them. So - but every time he came in with them, there's always a $50 dollar bill underneath the plate. You know, when they leave, they're going to leave. Ok, just (taps on the table and motions) $50. So it was years before I really married him, you know what I mean? And so then one day he called me and he said, oh, you think I can take you take you to lunch today? And I was much older and I was housesitting for one of my church members in Mililani. And I said, and I don't want him know where I stay, right. I not going give him that. So I said, oh, you know what - you're going to, if you want to pick me up, you're picking me up at Safeway in Mililani in the parking lot. And that's what I told him. And he said, well, you don't want me to know where you're staying. I said, no - I don't want you to know. So he said, Oh, Ok.

(Continues to share about how her & Mr. Causey got closer)

EC: And so finally the divorce was over. Then I come, got closer to him. So pretty soon I come over here and I'm moving in with him and I'm saying, ok, now what is

going to happen - do I wanna go feed pigs again, do I wanna go feed cattle again and things was starting to accumulate around what his activity is, right.

EC: So - but the piggery, I didn't mind the piggery because my father had a piggery over there in Loko Ea. So he - so my husband said, well, this is what I do. So we made a whole set up. So I - finally one day he was home here and I had gone some place and I came back and he told me "I made arrangements for us to get married." Oh, duhhh... But then in the meantime, I'm checking on his background too. Do you know what I mean? But I knew he had - he had a bad marriage and I know that he cared about me. And he said, you know, at that time, he said he... he said, "You know, I've been admiring you ever since I saw you with your dad," that is years ago! I mean, I was in high school, probably, you know, so he said "I want to marry you now."

EC: I said, umm you want to marry me? you sure you want to marry me or do you want to marry me? I said, Well, I'm not so sure you wanna do all this work, because he had a lot of work. He worked for 30 years at Hawaiian Electric and he came from Mississippi. So the years difference between him and I was like 7 - 8 year difference. So anyway, we got married was a very short wedding at Liliʻuokalani Church...

MCF: And he was already here? (Kawailoa - Daimond C Ranch)

EC: Oh, no, no, this - yeah, he was all in this. Yeah, he had, he had the piggery going. He had the cattle all over the place and he had horses. And so I would come up, I - before I got married, I stayed home a lot too, you know, because my dad was on dialysis. So we always had to take him to dialysis up Wahiawa. And so finally he gets up.... Wait, we got married on March 4th, 1992 (pauses to think and confirm)

EC: No, I came to the ranch in ‘83.

MCF: Came here ‘83?

EC: Yeah, 1983. Yeah. So I was in the - you know, it was really like a cowboy atmosphere because... pigs, cattle, horses, so... It was a ranch! You know. So I got up one morning, so I moved in yeah. When we decided to get married, you know, I moved in here and I got married to him in 1992.

(EC ponders and shares more about dates and details regarding the late Mr. Causey and their marriage)

MCF: That was the transition from Mr. Causey's business to you.

EC: Yeah, He changed - we changed everything when we got married. Yeah, he put everything under my name. Because he had 8 children and I told him, you know what,

they're not around to help you. You want to marry me? Well then you put the ranch under me, because if something happens to you, then I have something to lean on. And so he did it. They didn't like it because some of them was old already. His first kids was old. And today, fortunately, they don't bother me, you know - I don't care, I just do my thing. So that's actually what I did over here.

MCF: Right, well, ok, so from dad - piggery, and late husband and 39 years here on the ranch. Would you be able to share your thoughts or manaʻo relevant to Kawailoa? So this is of Kawailoa, but the transfer station or in any of the (motioning to the back/upper area)...

EC: Kawailoa Camp? Cause we went summer fun when we were young. Summer fun was up there sometimes the other half of the time - because my parents both worked. So they put us in this summer fun program. And then...Well, anyway we went up to summer fun at Kawailoa Camp. And that's where, that's where we spent our days was summer fun. And, you know, they had all kind of activities. And, you know, it wasn't as dangerous as it is today. Yeah. With going to those kinds of places to just walk around, walk around. But now it's all locked up, get gates, can't go up there.

MCF: All overgrown or locked up?

EC: Yeah, all locked up because people go up there and damage. Yeah, and then the pumphouse of course the pumphouse is here and even till today, I still have people that want to go swim over there.

MCF: Oh Yeah?

EC: Yeah. But if I see somebody, I tell them yeah - It's a liability. It's because of liability. And so I mean I try some of them come to my house and ask "Can we go swim in the marsh and the pumphouse?" They really remember that - I don't know, I never did go swim in there. You know.

EC: Oh yeah, yeah, yeah that's right. They had one open, one open place, you know, maybe the size of this room and they allowed that. But the one that they don't want them in, is the one that is inside the pumphouse. And people, till today, people still- my tenants over here, they get kids they like go swimming in there. No, no, no, no, no. - you guys stay out of there. So it's it's yeah, Ok - Kawailoa Camp because I had my mother's family, some of them live up there. So we always had reason to go up there, but then pretty soon, the gym, the swimming pool, which was run by Waialua Sugar. And there was a plantation store, which was all wooden, the kine - wooden, just like 2x4s and whatever on the, you know, not, not glass - I mean, tile or all that. No, it was just an old store. But they had the best food. (chuckles at the memories) So we spent, my family spent a lot of time up there, cause we had a lot of relatives that belong to

the Plimers and the Souzas and whatevah... So that's why I - when I had the session with Hannah. You know, I gave her the lowdown on everything, you know, and then, of course, my grandfather and grandmother on my mom's side was - they had lot of mana‘o, input - for me to give.

EC: So after a little while, then I was here. And I am still here.

MCF: So as far as you can remember about your experiences before being here and then up at Kawailoa Camp - How has area changed?

EC: I'm gonna say that I don't like it. I really don't like what they doing, but, I think if, if we had a say way back yonder, "Keep Country, Country." I think everybody would be more healthy than where they are today. Because you know, because everybody grew their own vegetables, everybody - no speeding like reckless kids and troublemaker kids - stealing from everybody. Everybody in that camp looked out for everybody and they must have had, I don't know, maybe 50 to 100 houses up there - old plantation houses. Before they tore it down, which was several years ago. They got rid of all the houses that had just been renovated. Does that make sense? That's wasting money. Yeah. And then when they decided to put Monsanto up there and do agriculture and other people doing agriculture, it's, it's not the same. So pretty soon the "Great Wall of China" goes (up), cannot go with car and you cannot do nothing. So, it must be 20 years I haven't gone ma uka. Then they put up the "Great Wall of China" at all the entrances and lock, keys and everything - so we cannot, you know, we cannot go up there.
But that's the sad part. I mean it's good for - it's good for, you know, what I want to share to whoever wants to hear about what's going on ma uka, up at ma uka today.

MCF: Do you recall, or do you know of any traditional sites or historically significant buildings?

EC: Up ma uka?

MCF: Up ma uka or even down here...

EC: Up at Kawailoa Camp, was a Japanese church up there. And right next door was a, you know, mix religion and all the different things that they had in the church. They just went up there and they bulldozed everything. All the houses and some of them had just been fixed. Yeah, you know, and now you go up there, it's all vegetation.

EC: Yeah, it's not like before. But I still have people that come, wanna know where the pool is, the one to swim in. My brothers, that's where they were when was summertime; they came over here.

EC: And needless to know, the person that is missing this place and over there is the sister, yeah? Cause I came in the picture right after that. So, I have to say that I really worked hard. Because we went and picked up pineapple all the cuttings from the pineapple stand every day, 365 days a year. Unless a machine broke and they cannot trim the pineapple, then we didn't go, but that was real seldom, never all the time. Yeah, there's always. And carrying those bales of hay, you know, him and I. Cause if we have to hire outside to help - where's your profit? Nothing. You know, to feed, it wasn't as expensive as it is today, but it's still during that time, it was still, you know, the price of everything was so cheap than compared to what you'd have to pay now. Yeah. You know, but um, then one of my father's sisters - I don't know if you met Mrs. Cannon.

MCF: Cannon? I get to meet her yet.

EC: That's my first cousin. Ok, because her mother was a Plimer and her father was Sato and they lived for years and years behind where the Beach House (restaurant) is, you know where the greenhouse where Kam School is, they said that's their office down Haleʻiwa. But then I found out there's another office for Kam School, someplace else, but I don't know.

EC: But anyway, she and I are close because she's born on February 11 and I'm on the 16th. So we get together all the time. Yes. She's married to Roy Cannon. And then they have sons. One is a sheriff with the state the other one is with architecture - he's an architect. And then the daughter is the director of nursing at Wahiawa Hospital.

MCF: Would she be good to talk to for Kawailoa?

EC: Yeah, sure. You know what, I going give you her name and phone number.

MCF: Ok. Mahalo.

EC: And she going tell you, "who gave you my number?" You tell her, your cousin gave me your number - what I do she gotta do. Cause what she do, I always go help her, because she and I really - I guess we're one of the talkers.

MCF: Are you aware of any traditional or cultural practices that might have gone on in this area, any heiau or sites?

EC: Oh they get one heiau some place over there. And get graveyards too back here. Yeah, you went behind here?

MCF: I have not.

EC: Come over here, I can let you out this gate. Yeah, right here. You can walk. There's a little bit of that. Yeah, on the cane haul road. When you're not busy, call me up, we walk with you out there. (passing Mrs. Cannon's contact info) And you just told her that I gave you her number.

(continues to share about Mrs. Cannon, their relationship and being the "talkers")

MCF: So with the information and the stories you shared with me and the historical background of this area and knowing what the project components are for the Kawailoa transfer station, what are your thoughts?

EC: About re-doing it?

MCF: Re-doing it or putting the green waste area.

EC: Well, as long as it's ok'd. Oh about changing it? Oh, definitely - yeah I think it's a great thing. Ok, sure. It needs to be changed, you know. I mean, before we had to drive up there in the dusty road and dump everything on the ground so that ground is compacted with a whole lot of stuff, you know. So and where they put the washing machines and the dryers and of old stuff. Oh they have to do something. They've got to...We should be entitled to that because all my years here, they haven't done anything. But I remember way back from about going up there and throwing it on the ground. So I think it's a great thing. Yeah.

MCF: Are you aware of any other cultural concerns the community might have related to cultural practices within the area or just things that you might be aware of or concerned for as the project moves forward?

EC: You know, the traffic is bad. Yeah, the traffic, whatever it is we got to deal with it, because it's, it's about to happen. Right now, I cannot think of any, any concerns, I mean, as far as, you know, the transfer station is a concern...

EC: I know from Kawailoa Drive ma uka, except for the 11 acres that I have in front, which is Dole, then it goes all the way to bypass - even all where the horses are, when you come in is Kam School. Because some of the, some of that land that people buying off of the bypass, some of that is Dole cause there was a lot of sugarcane in there. So main landowners, Dole and KS.

EC: I think there should be some concern of this transfer station now, because sometimes when I go up there, I say oh my god - this transfer station has to change cause one of these days we going loose somebody in that dump, because, you know, they allow anybody, the kids, whatever, flinging the rubbish - what if they go in too? Because it needs to be changed.

MCF: Updated?

EC: Yeah, updated is right. Yeah. But as far as in here...because I have a graveyard on the property. Which sits back - There's a Japanese graveyard, but they had for years and years and years, they had the same guy taking care of the graveyard, like when it's a holiday and when it's clean up time. The Japanese church from Waialua, they used to come and clean. And then after they get through, they go right up here to this one, to this graveyard and clean all that. Because through marriage, the person that was, was a gung-ho person about cleaning these two graveyards - he's related to me, but not with blood, but he's related. His aunty is my aunty. Like, my mother's brother is married to his aunty. And we all, we all - he passed away already - this guy he had cancer. But when he still- and then when he found out that I was here, that was even worse. I mean, every time he came down, he would bring me one pie, or manapua, or something. But in the last five, six years, he had pass away because he had cancer. Cause now, nobody cleans the graveyard. The one down here is even worse. But the people that came are all old people.

MCF: Right.

EC: So they all went together, I guess, you know, and nobody took on the kuleana after, because there was no young people to take over. So nobody - since he passed along, I would say, has come and done. And then the young generation is scared for go in there... Talk about going to a graveyard, they don't like it, what, why are you scared? There's nothing. They're gone. I mean, they're buried. And that's years, I mean, you know, it's sad because the younger generation I mean, you know, even some of the young generation now you think they want to go to the grave? I mean, you know, it's not - we cannot dwell on the passing of your family members and all the others. Cause if you're going to dwell and get sick, you miss them, of course we all miss them. But still, you know, life goes on. You cannot make your life miserable. So, like, even with my parents, too. Oh, before - every week, my mom, every week - going to my dad's grave, going to my dad's grave... Mililani. Yeah. And finally when it came our time for be old like them. Oh man, ok now. Ok, you go one time. I go next time and you know, take turn, that's how. And then the price, everything goes up. Right? It's not cheap like before now. So I don't know. We just, it's just so, so different. I mean, where Diane lived - before, by the Beach House. We had some good days growing up over there.

MCF: And that was my last question, if you had any other kūpuna or kamaʻāina that might be knowledgeable. So you gave me her number and thank you.

EC: Yeah, she's just in the Plimer side. And, for me, she was Sato - her father was Sato. And he had the appliance shop. You know where the monument is in Hale‘iwa Park, used to be Jerry's. Did you hear about Jerry's Sweet Shop?

MCF: Oh, yeah. Yeah, across the street.

EC: Yeah, was across the street. And right next to the sweetshop was - and they made the best hamburgers - five hamburgers for 1 dollar.

MCF: No way?!

EC: Yes, yes way! And that's where the best hamburgers and make the patty. Not the kine, frozen kind. You know. Her parents had an appliance store, Jerry's and the appliance store.
Then came where the beach houses used to be Seaview Inn, the original, my mom worked over there, my father played music over there and everybody and they - Diane them, they lived on the pond; in the house. I mean, the house is kind of renovated now. That's where they really was brought up.

MCF: Ok, so do you have any stories?

EC: Oh I could sit here for now till midnight.. (laughs)

MCF: For the Kawailoa transfer station, do you have any more thoughts?

EC: Like, you know, we went last week. To the Middle Street transfer station - in town, as you know, on Middle Street. I could not believe how huge it is. And it's piles of rubbish. No dirt. You no see no dirt. No. Oh, my God. And the thing is, it smells so terrible. Sanitary-wise. Yeah - must have had plenny dead animals they throw em inside there. But anyway, if they going into the ground and they're going to do that, that way, like back yonder, when they had piles of rubbish over here. Then, that's not good. Right? If they gonna build, you know, something decent, like (where is that, where did we go, thinking/conferring with boyfriend)

MCF: So here's the existing site facility (showing map/layout)

MCF: Yeah, Mahalo Aunty Emmaline, I appreciate that.

EC: Mahalo too to you Maka, and if I can be of any more - questions & answers; just give me a call or stop by.

MCF: Will do.

APPENDIX E: INTERVIEW WITH UNCLE THOMAS SHIRAI

TALKING STORY WITH

THOMAS SHIRAI (TS)

Oral History for the Kawailoa Transfer Station project by Maka Casson-Fisher (MCF)
For Keala Pono 10/17/2020 at 12:00 PM via Zoom

MCF: Hi uncle, are we ready? Have you read the consent form, do you have any questions, can we go ahead and record?

TS: Ok Maka, that's no problem.

MCF: Ok.

TS: I feel it's time and it needs to be recorded.

MCF: Mahalo. I am going to get your information so that we can put this into the format.

TS: Yeah.

MCF: Can you see the screen I'm sharing? I'm sharing a screen or sharing a document with you that has the questions on it. (Sharing interview questions via Zoom)

TS: Oh, wait, gotta make em more big.

TS: Oh, yeah.

MCF: Ok.

TS: Oh, like one Word doc and stuff, get all kinds of questions I see on top and yeah?

MCF: I'm going to start with number one just so that we can get the information for the report. And then if you want to go off on other moʻolelo; that's great. Just wanted to make sure we get the pieces that we need.

TS: Ok, we go down the line with your questions.

MCF: All right. Thank you so much, uncle. To start, please tell us about yourself, your name, where and when you were born, where you grew up and where you went to school.

TS: Ok? You get one cup coffee yet?

MCF: Yep.

TS: (haha) I just making one joke. You get your lunch ready?

(both laughing)

TS: Ok. Ok, Ok. Ok. I was born. My name is Thomas T. Shirai Junior. I'm Hawaiian, Chinese, I'm one, ok, here, I'm half Japanese, one third Hawaiian, one eighth Chinese. That's my ethnicity. My mom is Laverna Keao. She's three quarters Hawaiian, one quarter Chinese and my father is Thomas Shirai from (microphone muted)

MCF: Uncle you're muted. Uncle you're muted. Uncle Thomas you're muted.

TS: Ok got em. How bout now?

MCF: Ok. Thank you. Yeah, got em. We got the part about your father being Thomas Shirai.

TS: Ok. My father is Thomas Shirai. He is pure Japanese. From the Big Island of Hawaiʻi in Papaiko. My mom, Laverne Keao, she's the daughter of David and Abigail Keao. And she was born in Waialua, one piko family of Waialua. I'm an only child. I was born in 1961. I was born at Kapiʻolani Hospital. Ok, the first day after my birth, I was taken - my mom and I went to live with my mom's parents, David and Abigail Keao in Mokulēʻia because my father had tuberculosis. And he was ill, so they sent him to Leahi Hospital by Diamond Head. So, from an infant age, until my father got well, I resided with my grandparents in Mokulēʻia and my Mom. When my mom and when my father got healed from tuberculosis, I moved back to him on Fern Street in Honolulu by Mōʻiliʻili. Then we moved to Paliuli street in Kapahulu. Kapahulu, I was raised extensively over there too. Okay, my father was a manager for an apartment complex. And we resided on Paliuli Street, then later we move to Olokele Ave. which is the backdoor for Kaimuki High School. So I know those areas well. I've lived there for 18 years. Now, there's something unique and I like to share. When we moved, when we moved back with my father, my first preschool, I went to preschool at Mother Rice Preschool in Moʻiliʻili. Then I attended Ala Wai Elementary School from first to sixth grade. After elementary school, I attended Washington Intermediate School. Then, for high school, the first two quarters of my sophomore year, I attended Kaimukī high school. Now, what is unique is, when I reached tenth grade, I just didn't have the drive to go to school anymore, you know, it wasn't because of my intelligence. It's just I didn't - I wasn't motivated. And I had flunking grades not based on academics, but because of attendance. Lack of attendance. Yeah. I went to my parents, my father got to work. Then I come back home and I stay home. But I did what I did when I didn't go to school for that first half of the school was, that's the bulk of where I learned how to play the ukulele very well. Because I didn't interact, come up with my friends or have girlfriends because I wanted to play ukulele and I didn't want to just play it. I wanted to be very good and I did become that, later on in life. I had…very supportive grandparents and family and my parents. They bought me all the records of Ota San.

TS: My grandparents were also my parents. On the weekdays, I would stay with my parents, in town, go school, and when it comes Friday. When it comes Saturday morning, my grandparents from Mokulēʻia. They come from where my house is today, where I reside, they leave about three o'clock in the morning, didn't have freeway now in those days. They travel to town two - three o'clock in the morning, all the way to Kapahulu, Hoʻokele Ave, where I stay, just to pick me up so I can spend the rest of the weekend with them. Yeah, you don't see that today. So that was my weekend home. Throughout my life and, you know, every holiday and spare time, you know, school break or whatever, I spent it there. I don't know my father's family because they on the Big Island.

Ok, so it's just like I had two sets of parents all the way to high school. Even when I didn't attend, like what I shared. I never liked to go to school - tenth grade, for attendance purpose. I have you know also I didn't go to Waikiki Beach like all the townie kids, because I knew what a real beach was. Which was like in the country, you know.

TS: continues to share about current residency and "beach life" in Mokulēʻia

TS: They was so open, that they asked what I wanted to do about it. I said, I like go live with grandpa and grandma. And there was no objection because they thought that was the best remedy. So because my grandma was also the custodian at Waialua High School from 1948 to 1978 and I used to, during the summer time, in the elementary school, I used to spent my entire summer with my grandparents and I go to work with my grandma. Her area was the front, the front where Sagara Store and all that. That was her kuleana - that part of Waialua High School and I help her clean classrooms and stuff like that with the other summer workers. So I knew the staff, the faculty, I knew plenty friends from Waialua Summer Fun. And the teachers, all that kine stuff. I knew them already. Before I went down there, whenever we agreed that I would stay down there. During the faculty meeting my grandmother went out on a limb and she asked the faculty to please help me.

TS: Continues to share about his transition to Waialua High School

MCF: Well, I appreciate you sharing your growing up experiences and how you came out to Waialua for first the weekends, but then after transferring to Waialua High School, pretty much growing up the rest of your time out here with your grandparents. And what so being that you guys were in Mokulēʻia and then you talk about your family out there, the Jehovah's Witness, what's your association to the property that's in question? Kawailoa.

TS: Ok, they all interacted and that's why I gave such a long introduction and stuff. And during the days, I get nothing bad about my grandparents. I had one fantastic relationship, nothing bad. Even if I got lickens sometimes - it's all good, you know. And some of the activities that my grandpa and grandma and myself did. We had an interest

in antique bottle collecting, so that opened a lot of doors. Hawaiian history, Waialua history, appreciation for antiques, moʻolelo, all those kinds of things. And he would share, you know, some of those things now.

TS: Going to that property over there, Kawailoa. Ok - part of my involvement later on in my years, I you know, I participated in being an island burial council member twice, two terms. And I served when it was available, when they had the Office of Hawaiian Affairs, the Native Hawaiian Historic Preservation Council. I was a part of that committee, Kaʻena Point advisory group cultural representative.

TS: And that all evolved - to basically sum it all up - It's all my grandpa. It's all him. Whatever I know. Yeah. When it comes to all those kinds of things. Kawailoa has a very special meaning, like many places in Waialua. And so the Kawailoa history starts with the family - branch of the family - ʻOlopana. Part of the family.

TS: And to that person that I shared with you in a phone call. And it's recorded in newspaper articles, the deed transfer, transactions, bureau of conveyance, all those types of things. Because at one point I was also doing my genealogy, moʻokūʻauhau and I went to places like the Latter-day Saints Library. Like, not only the one in Lāʻie, but the one in Honolulu. The Kalihi one is the most expansive one, there's all the records. Cause each place, get different records and they don't have them all.

TS: And I spent - I can leave right now and I no come back home until nine o'clock. Even at the library, and stuff of that sort doing research. Cause I'm not just going there to just look at the manuscripts or the microfilm. I want a copy of that, you know. I not going go over there just write em down on one composition book.

TS: Continues to share about the importance of seeking resources and visiting these places.

TS: The Latter Day Saints had a marriage record, you know. That shows one of my grandpa's kupuna, way before he was born in the 1850s (or 1830s), a man named Pila ʻOlapana married into our family. So that's one of the connections, yea from that. And so the land transferred - all of it is a domino effect, you know. ʻOlopana, and that's how my relationship over there through genealogy, in the land and all that. But the most significant thing that I remember (and I got it, and I will send you) is doing my genealogy research. Also inquired with the National Archives, because my grandfather was an employee of Public Works. You know, the GSA and all that stuff, the public works for Pearl Harbor, so they have all these records, you know, like his resumes, work record and all that, and it shows what his accomplishments were. Well, low and behold, get one section I saw that they gave me. Had a page that has his job resume and part of that resume, he built all the structures for Meadow Gold Dairy. All the cattle pens, the homes and all that for Meadow Gold Dairy. Yeah, he built them all, and some of them is still existing today. The fences, Lani Moo, and stuff like that - he built them from way

back then. So that's why and for my grandfather, but he as a child, he used to go - a big part of it was ‘Uko‘a Pond. ‘Uko‘a Pond you know, they go, and they always knew and they always acknowledge Laniwahine. They always did that - they no call em ‘Uko‘a Pond, they call em Laniwahine. They acknowledge the deity. Yeah, you know, there's kapu fish in there- you not supposed to take em. And that's in the Sites of O‘ahu and all that, but he remembers he used to go over there, you know, when they go catch fish, they go and cut bulrushes because the thing make sticks and then they string em up, string em up - use that for the kui. And they sell em or they take em home for care after they go dive. Things like that.

TS: And he said - that's why get all the subterranean springs over there - and I don't know if you went there Maka. With Emma's brother "Boy Plimmer" he used to take us during the summers when he got a pump. The plantation had a pump over there.

TS: Yeah. And used to get one big pool, and that's fresh water and that buggah is cold, cold, cold. I mean we used to go swim, that thing is like ten feet deep.

TS: At the bottom get prawns, Malaysian prawns, so we used to go dive and (poke em up), and pick em up, catch em and boil em and grind yeah. That was a treasure for all of us to go down, a treat, to go dive you know go swim, especially on these kinds of hot days like these. He would load us all up in his Volkswagen, get about ten of us in one Volkswagen (laughs at the memory). But we go and that's one of the things that we did.

TS: But when the plantation, for liability, when they closed up, they demolished some of it and they filled up the hole. But you can see - you can see traces of places, you can see where the water is still coming up, and that's fresh water, you can actually drink the water. That's how cold and fresh and pure it is. And my grandfather says he remembers seeing some parts you know like how you see in the ocean; you can see the channel dark and bluish like that... So you can see the thing going deep like that and the things come out the ocean.

TS: Shares about Boy Plimmer and Aunty Emmaline

MCF: So you were talking about getting some prawns and going holoholo over there - Kawailoa, ‘Uko‘a and then Laniwahine... As far as you remember, and your experiences - because you talked about those experiences, how has the area changed?

TS: You the kine guys that like build their gentlemen houses in one other section, Kawailoa camp is closed, of course, because no more the plantation. You know and still get the graveyard, but some of them went up there and they exhumed and had em reburied at Mililani Cemetery for safekeeping purposes. And we were afraid, we don't want that type of development over there.

We understand you like make the bypass road because of that situation over there. You know, I mean, Maka - that whole place is one traditional cultural landscape. I think, from over there go all the way up to, you know, the bluff at Waimea over there. I forget the name of the heiau, I cannot think of the name right now... All I can remember is Keahi o Hapuʻu (on the ocean side) but get the heiau in the back over there - Kamehameha School property. But all of that, all Kahokuwelowelo - that's all the landscape for the whole place.

So if you impact one, you going impact all of them. You know, cause they all in line. Yeah, that area, like I said. So, when they made the transfer station, I was surprised they made em over there, but at the time, everybody is working, nobody know the... Our parents and their grandparents, you know, never have time for look at the EIS and things like that, they out making a living for us, you know, put food on the table.

And so when we get wind of it, we adults already and we educated, we understand the EIS process and all those things. You know, but before that transfer station over there, that used to be just one regular landfill. You know, big time - was a big landfill, just a miniature Kailua landfill. Was mean - the main concern that we saw, that we recognized - that when they made the landfill and stuff like that, the water pilau already - cause the seepages, never have such things as (linings) and all those things and the EIS never have that or the environmental laws that they have today.

So, you know, one of the things going be - high content of lead. So which means the fish is pilau - no can eat em already, you only going catch em for a trophy, that's all. You know, only get a few clean, clear spots left, but that's - if you're looking for that, that's my association over there at that, the immediate area over there. The other Kawailoa history, that I can share is - it's recorded already in, in your company's EIS - for another project I think it's for another project, you gotta go check the Keala Pono library. It has the Site 235 - by the Haleʻiwa, original Haleʻiwa Beach Park. All that area over there is part of Kawailoa – Puaʻena.

TS: So, it has the only existing picture of Site 235, the stone, the Puaʻena Stone and I believe it's still there. It's just hiding - kolohe the stone – when it doesn't want to be found - it hides itself.

Yeah, so my concern is, you know, I sad - you know, such a special place over there, that cove, and you see plenty people go over there go sunbathe and camp, all that kine... You know, it bothers me, especially because I see my grandpa's kupuna inside the picture and they over there, they doing some kind of interaction with the cultural site, they practicing their culture, and you see the boat and things like that. It's a 1935 picture, you know. And so when I go over there - I see it, when I go, I'm sad. I'm sad and angry that these people they only using that because it's one nice cove for go sunbathe and stuff like that and overcrowding. Plus, when they finish they no take their ʻōpala - you know all those kine things. The homeless go over there - defecate - it's bad.

TS: Not only that site is marked. That's also when they had, the most for me. I jumping around, I'm sorry, but that's because we're talking about Kawailoa. The Kawailoa kuleana - the project that I most participated in was that what you call in the 1990s, 1997/1998 - that's KS property, ok, at that point in the front - Pua‘ena Point.

They had a proposal to build the Pua‘ena EcoCamp - and, you know, it's 100 something acres and what's going to be 200 something, you know, a huge number for ecotourism, build camp. And it was going to impact the area you're talking about all that, the eco tours and hiking and all that kine stuff. Like they going maha‘oi or something like what they do at Turtle Bay, they get them along the sites they get the - they expose the sites and stuff. People take pictures of em and stuff like that - we don't want that.

I was one. In fact, I was about the only one that went to every single hearing, that opposed. I went against my own family and the Hawaiian community cause I stood on the banks of my ancestors and the Hawaiian culture. Because the jobs they was going give was only going to be like – weed whacking - labor jobs, no more administrative jobs for people like you, you know, or curator or stuff, that's all haole people they save the job for.

TS: So that is not right, that is not right and the menial paying jobs and what they did was - sorry I gotta say that - they used some alumni of KS to try and push this project through. And I going tell you, get one on top the board (NSNB). And was my cousin, that's J.H. Had another one J.A. senior. They used them two, to try and get the Hawaiian community and they used my uncle D.K. to try to talk to me, tell me, please support this project. I told my uncle, no, I'm not going.

And they never give me too much, and they angry with me, but they know when to back off because they knew my grandpa. Yeah, that's family. And he's the elder - so if you make trouble to me, you had it. And that's all to it. So what also, it wasn't just a Hawaiian peoples issue. It was understanding the Papa‘iloa residents over there and they really embraced me and they took me in. Whereas the others, they say - only a bunch of rich stuck up, haole people. No they not. They only defending their own property, just like how we had, and then I said rich? And I told some of the ones, the people I said, we all have the same opportunity to buy that property. They just so happened to be more active than us, and they wanted that property, so they went buy em. You know, you got to respect that. It's impacting them and they part of our community, too. And I feel when they went take me in and my wife, Aunty Jackie, you know - they learned a lot about Hawaiian culture and values. They get one different outlook, now yea, respectful, them being more respectful.

TS: Continues to share about various properties and value of land throughout Waialua.

TS: But there's also a picture of Laniakea that the Bishop Museum has, that I have. It has to do with a hukilau. They did a hukilau there and it shows them not actually surrounding but the fish that they caught and they show some of the people that was at the hukilau. And one of them is people like, had been Ben Dillingham on top the picture, you had J.A. senior from the picture, not this J.A. that the ones you guys know, his father, that generation and my grandpa's grand-uncle, Uncle Oscar Cox. Now that man is a significant man of Waialua. He's also Kamehameha School's alumni class of 1890. But he became the United States marshal of Waialua. Yeah, yeah, big, timer. And he's featured like his sister Annie Keahipaka, that's why they get Keahipaka lane. Daniel Hoʻokala and all of those - they were Waialua hui informants for the Bishop Museum. It wasn't under the tenure of Mary Pukui. It was under the tenure-ship of Lahilahi Webb.

MCF: Lahilahi Webb?

TS: Yes, they don't give her enough recognition, and I'm saddened. They only look at her as a weaver, yeah, one lauhala weaver. But she helped translate Hawaiian books and one of those was Kamakau kine books. And they had one committee. The KS ruling chiefs is the main book they went translate. That and she deserves more recognition and so another kupuna that get lots to do with Waialua - Emma Nakuina. Those two ladies are very, very prominent yeah.

TS: But, Lahilahi Webb is the focus because, you know, she - my grandpa and my family liked her so much. Maybe the way she was as a person - they liked her so much, they went hānai her. So that lady becomes part of our family. You know, and so when I was growing up, when we look at the Sites of Oʻahu, you read em and stuff. He would always remind me who that lady was and how she's related to our family. He said that lady came down to Waialua specifically to visit our family because of land and stuff, you know. She came visit us and they stay up late at night talking Hawaiian he says. All kine Hawaiian, things about Hawaiʻi and things like that. And you know, so I have a lot of ties to this kine stuff. Yeah - that's what I wanted to share. That's what I have about the Kawailoa area specifically. You remember before, maybe they still had em, you know, before you turned - coming from Haleʻiwa, you turned to go to the transfer station, that area, the pine trees and stuff you remember used to get the carnival over there - the carnival rides. Merry go round, horse ride, all that kine over there...

TS: That's part of Waialua history. That's Kawailoa as far as I'm concerned, you know, it has a lot of history in the area. Covering all time periods, especially plantation era. Not only the pre-western. Of course you had the NS Archaeological Field School - the classes that they would excavate a site and stuff, but they never excavate that site where Aunty Emma's property. They never excavate em.

And, you know, we want to keep - you know - It's there and they can excavate em but leave em alone. Bumbye people going go over there, bother Aunty Emmaline or they going trespass they going over there and we gotta think how ignorant some of them are - they going over there, no one looking - they going take the lava rock, the stone from the cultural site, they going put em on eBay "Hawaiian Cultural Stone $50". We don't want that kind of things going on, right? It's part of our history - so just leave it alone.

But that, my main manaʻo is over there - that was a potential area where we believe Kapukapuakea Heiau is situated in the depth of the sites. Cause of all the sites, we believe substantiates what my manaʻo is about how I feel about that property.

TS: And so, that's what I get to share with you.

MCF: Mahalo uncle, and one last question regarding the project, regarding the specifics of the project, this is the proposal (shares with TS the project proposal documents and maps).

TS: I support it. I support it Maka. No need pitch to me, it's needed because it's going to benefit the property. Not because they have to build - if they have to go through the EIS process and go with all this, you know, just have to be mindful and careful and when building in that area. That's how I feel, as a whole.

MCF: Ok. Mahalo. I do appreciate you taking the time today to speak with me and to share with me that we can compile this.

APPENDIX F: INTERVIEW WITH JIMMY VASCONCELLOS

TALKING STORY WITH

JIMMY VASCONCELLOS (JV)

Oral History for the Kawailoa Transfer Station project by Maka Casson-Fisher (MCF)
For Keala Pono 11/11/20 at 2:00 PM

Note: interviewee read the consent form and has no further questions

MCF: Thank you - I am going to start recording. Thank you Uncle Jimmy. To start, please tell us about yourself, - your name, where and when you're born and where you grew up and if you care to also share where you went to school.

JV: I went to, well first of all I was born 1953. I am 67 years old, now born and raised in the Waialua, Kawailoa area. I went to school at St. Michael's and graduated from high school.

MCF: Thank you. Could you tell us about your 'ohana or family background.

JV: Well, my grandfather - Portuguese came from Maui, I guess and was working at the Waialua Sugar Company, til he retired. My dad was working in town and he got his job at the Meadow Gold dairies at Kawailoa. We lived in the Kawailoa area when I was born up until, the 4th–5th grade; then we moved to Waialua. My grandfather had his farm, he had a taro and hasu lo'i and his cattle ranch and a farm. His property that he was leasing started from behind Jameson's - Loko Ea. All the way Kam Highway all the way to Kawailoa Road up in the back where the rubbish dump is now, behind the dairy all the way to Ashley Road. So he had all that area with his cattle and the lo'i was at 'Uko'a - swamp area.

MCF: Oh, ok - so that also covers your association to the subject property, which is the Kawailoa transfer station.

JV: Yes.

MCF: Is there any other associations to that subject property? Maybe family, land, workplace, etc.

JV: So that was, part of the rubbish dump now - the landfill area, was part of my grandfather's ranch, but the city, I guess the city took over that area a long time ago when they started taking the refuse there from the refuse trucks and the community. I remember the road, the entryway there was a cattle guard so I knew had cattle in there before, but ever since then, it's been years. I mean, probably in the late and the early '60s was taken over by the city.

MCF: Who's ranch was that?

JV: My grandfather, John Vasconcellos.

MCF: Ok, so with your grandpa's ranch and you growing up over there, are there any other ways that you have acquired special knowledge of the area?

JV: It's just I know, I know that my grandfather found some Hawaiian artifacts like - poi board, poi pounders, I guess you'd call it 'ulu maika, and what is that other one ... the one that looked like the torpedo?

MCF: Oh, the moa pahe'e?

JV: Oh, yeah, he found some of those that was somewhere between Kawailoa Drive and Hale'iwa Beach Park - somewhere in that area. Supposedly, what I heard was an old fishing Hawaiian village in that area. So maybe the artifacts that was located, well found, by my grandfather was from that village and I know that he had given or donated most of his findings to the Bishop Museum. Some went to the dentist in Wahiawa—couple poi pounders. And I think my aunty, one of my aunties in Nu'uanu, had acquired a poi pounder of my grandfather.

MCF: Oh, wow. As you're sharing about all these different artifacts, can you share of your mana'o or thoughts relevant to Kawailoa area and the Waialua area? Maybe personal anecdotes or stories that you heard...

JV: No, it's just that the stories, but the stories was just, not much stories, but what was basically what we used to do in the area was, like I said, my grandfather used to farm the lo'i - hasu and taro, cattle ranch and we used to also go fishing in the swamp areas where they had some tilapia and crayfish. No, I don't recall any heiau(s), but there was a rock pile, I believe probably was plantation. But there was no cane fields in the area, so I don't know why the plantation would pile up rocks. That would be right next, off of Kawailoa Road, above the transfer station and alongside of the big water pipe that used to have coming down from Kawailoa to the water pump across the landfill area that had the water pump station. And throughout the pasture areas, there were stone walls that was made, I don't know by who, but the stone walls was run from ma uka to ma kai, as far as I remember. It was probably just land divisions that they had from before.

MCF: As far as you remember and your experiences, how has the area changed?

JV: Well, the area that I know of, didn't change very much. It's just that the transfer station is still there. I used to work for City and County. I was a refuse collector and those days we used to just dump the rubbish and they used to flatten it out with the bulldozers and then used to bury it with dirt. And after I left, to continue my career in

the C&C, they had built a transfer station. And that's what they have now, just a transfer station, and then as far as the, there was a Kawailoa town. A plantation town back in the, when the plantation was in full swing. Now they went back to the original property, I mean, the landowners and they got rid of the town that was up there, the Kawailoa town. There was a Buddhist church, Catholic church, a gym, movie theater, swimming pool, stores, a public school. I think the public school was up to 6th grade, I believe.

JV: And the houses were for the plantation—the plantation workers. It was a, kind of, thriving community with its own store and movie theater.

MCF: Wow. So, as you mentioned, working for the City and County. But you also mentioned that the site, the transfer station site was on your grandfather's ranch?

JV: I believe that was part of the lease that my grandfather had. 'Cause I remember going in there and there was a gate - it was a cattle guard where the cows and cattle couldn't cross. And I believe my grandfather had some cattle back there, I was kinda young in those days so I cannot really fully recall the whole situation.

MCF: Was the transfer station a transfer station when you were younger or was it just...

JV: The transfer station - in the beginning was just a dump. They used to dump the rubbish, they used to run it over with the bulldozers, and then they used to bury it with dirt and continued layer after layer. So, if you go there now, you'll see a huge hill, maybe about 40, 50 feet high. Back in the day, it was the same level as the road. And eventually throughout the years, it built up. And later on time, I was working as a refuse collector, we was still dumping. And after I left, they built the transfer station. The transfer station, I believe was built, oh wait I cannot recall, I don't know if I...[pauses to think back]. I believe the transfer station was built after '76, after I left. Oh no, after '79—I cannot remember—so somewhere around that area.

MCF: Ok.

JV: I was working with the City & County '76–'79 then I transferred to a different department in 1979.

MCF: Well, you also mentioned Kawailoa town and some of the buildings and what the town looked like. Do you know of any traditional sites or historically significant buildings which are or were located in the property area?

JV: The property area, where the dump is?

MCF: Where the dump is, but also just extending out to Kawailoa in general.

JV: Ok, in the immediate area, there wasn't any homes, anything around the landfill area. Across the street, there was a pumphouse. Plantation used the pump to irrigate all their cane fields and in the back of that, there was three houses. One of them was a house that I grew up in. We moved, we moved to, after I believe I was 5, maybe 4, 5 years old, we moved up the street, which is in the same area, but just another house above the cane road, which is just above the rubbish dump area. But Kawailoa town and all that, the gyms and churches and stuff was up on a hill—on the top of the hill that was above, way above the landfill area.

MCF: How far away would you say it was?

JV: Oh, if you go by driving, I would say probably about a half a mile uphill. If you go straight across, probably be the first house would be probably less than a quarter mile away.

MCF: That's where the pump house was?

JV: No, the first house of the so-called Kawailoa town.

MCF: Oh, and how far would the pump house be? The irrigation…

JV: Pump house—from the front gate of the landfill to pump house, if you go in a straight line, is probably like maybe 150 yards. And then right behind the pump house, another 75 yards would be the three houses that I mentioned earlier, which is one of them that we lived in.

MCF: In speaking with another interviewee, they mentioned swimming in the water hole. Did you guys go swim over there too?

JV: I was too young to go swimming in the water hole, but they had the high school kids and teenagers would go swimming, would be swimming in one of the big wells that was connected to the water pump station. Supposedly the story was that - that hole was there from before time. It wasn't man-made. And was supposedly connected to the sea, the ocean, which is about less than a mile away. And that's where the—now this is a story that I heard from when I was growing up. I don't know if it's true or not, but they say that's where the shark god would come in and pick up his sacrifices there.

MCF: Ohh, wow. Do you think the proposed development of the Kawailoa Transfer Station, building out another office space/restroom area for the workers would have any effects, would affect any place of cultural significance or access to places of cultural significance, as it currently is?

JV: If it's in the same footprint as the landfill now, I don't think it'll affect anything right now because I know for sure that the—well, not for sure. But as far as I can recall, there was no other buildings or any other artifacts that my grandfather found in that area. And as far as the restrooms or anything like that, right now, the area is on a swamp area. So I know they cannot make a cesspool or septic tank. They have to make a regular tank that would have to be transferred to another sewer system.

MCF: Ok, so you're saying no, no effects on the current footprint as it is.

JV: As it is right now, if they—if it's in the same footprint, then I can't see any impact right now. Unless they find something else in the area.

MCF: Right, right, right. Are you aware of any traditional gathering practices in the property or near the property or the surrounding area?

JV: No, just like I said earlier, that the only thing I remember my grandfather mentioned when he found those poi pounders and other Hawaiian artifacts was—between the Kawailoa Road, which is from the road all the way to Loko Ea, in Haleʻiwa. It's somewhere in that area, I believe was more close to the existing Haleʻiwa Beach Park area now.

MCF: And you said your grandpa also recalls or heard stories that it being a traditional Hawaiian fishing village?

JV: I believe, he believed that also. But also mention—I mean, also heard the stories from other people that that was a fishing village, a gathering fishing village, but was most basically was made for the visitors from Kauaʻi, that coming over to Oʻahu and stay. And they have a place to stay when they visit and then return to Kauaʻi. That [story] I got from one of my classmates, Leif Anderson, who is also a Haleʻiwa resident and his parents and grandparents, as was, has lived in Haleʻiwa for many, many years.

MCF: Right on. Mahalo. So while development of the area continues, what could be done to lessen the adverse effects on any cultural practices in the area?

JV: Well, before anything is approved by the state or city, we should, we should make a study of the area first. You know, get as much information from people that know the area, which is getting less and less now, because many of the old timers are not with us anymore.

JV: And a lot of the, the old timers, kids and grandkids are moving away. Yeah, so I just, I just hope that they do a good study first before they start doing hotels or other things besides just keeping the area natural.

MCF: Ok, are you aware of any other cultural concerns or community concerns that you, yourself or your classmates like Uncle Leif might have related to the area or surrounding area?

JV: No, they had that, I believe someone wanted to develop the area between Loko Ea and Haleʻiwa Beach Park. You know, what that is, used to be Loko Ea pond on the Kahuku side of that, they wanted to build, I believe, a hotel or something. And like I said, I'm not sure where the exact fishing village was, but it would have been in that area somewhere because most travelers, sea travelers, would come into that bay that's located at the harbor. Yeah, that would be the ideal place that I thought was the fishing village.

MCF: Well, you mentioned, Uncle Leif, do you know of any other kūpuna or kamaʻāina or cultural lineal descendants or any other knowledgeable people who might be willing to share their manaʻo of Kawailoa in the Waialua Moku?

JV: Well, I cannot think of anyone now, but if I do I'll get back to you. The two or three people that I know have already passed away, so like I said, you know, it's thinning out with the people that knows the area.

MCF: Alright, any other thoughts you want to share?

JV: No, not right now.

MCF: Ok, thanks, Uncle Jimmy. Here ends the recording.

Appendix C

Literature Review and Field Inspection

DAVID Y. IGE
GOVERNOR OF
HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
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LAND
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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD., STE 555
KAPOLEI, HI 96707

March 11, 2021

IN REPLY REFER TO:
Project No: 2020PR35019
Log No.: 2020.02891
Doc. No.: 2103SCH07
Archaeology

Manuel S. Lanuevo, P.E., DBIA, LEED AP
City and County of Honolulu
Department of Environmental Services
Refuse Division
1000 Uluohia Street, Suite 201
Kapolei, Hawai'i 96707
c/o Gaudencio Lopez
gaudencio.lopez@honolulu.gov

Dear Mr. Lanuevo:

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
Request for Concurrence with "No historic properties Affected"
Construction and Site Improvements at the Kawailoa Transfer Station Project
In Reply To: RE 20-031
Kawailoa Ahupua'a, Waialua District, Island of O'ahu
TMK: (1) 6-1-005:018 por.

This letter provides the State Historic Preservation Division's (SHPD's) review of the City and County of Honolulu (CCH), Department of Environmental Services (ENV), Reuse Division's proposed project titled *Construction and Site Improvements at the Kawailoa Transfer Station*. The submittal included the ENV's cover letter dated November 24, 2020, HRS 6E Submittal Filing Fee Form, SHPD HRS 6E Submittal Form, TMK map, and a property map. The submittal also included a supporting document titled *Archaeological Literature Review and Field Inspection for Construction and Site Improvements at Kawailoa Transfer Station, Kawailoa Ahupua'a, Waialua District, O'ahu TMK: [1] 6-1-005:018 por.* (Gross et al., November 2020). The SHPD received this submittal on November 25, 2020. Previously, in a letter dated November 13, 2001 (Log No. 28567; Doc No. 0111EJ09), SHPD concurred with a project effect determination of no historic properties affect for the project. However, due to the expanded scope of work for the project, ENV has determined that a new Environmental Assessment (EA) is required for the project.

The Kawailoa Transfer Station is located at 62-180 Kawailoa Dr., Haleiwa. The project area is approximately 0.72 acre. The project scope includes expansion of the Kawailoa Transfer Station to handle the collection and storage of green waste. The proposed scope of work includes the construction of a second load-out and a permanent office and restroom structure within the existing transfer station. Project-associated ground disturbing activities will involve vegetation clearing, minor grading and excavations, and general construction. The submittal indicates that the project area has been extensively disturbed by the construction of the existing Kawailoa Landfill and Transfer Station.

The Literature Review and Field Inspection (LRFI) report provides an overview of historical background information and previous archaeological studies. The LRFI indicates that 10 archaeological studies have been conducted within 0.5 miles of the project area. These studies documented several historic properties in the vicinity including historic trash pits, cultural layers, WWII remains, a Japanese cemetery, and human burials. These sites are

outside the work area and will not be affected by the proposed project. The field inspection did not identify any historic properties within the project area.

A review of SHPD's records show that no archaeological inventory survey has been conducted, and that no archaeological historic properties have been identified within the project parcel. The USDA (Foote et. al 1972) identifies the soils as Wahiawa silty clay, 3 to 8 percent slopes (WaB) areas. Low potential exists for the project to encounter subsurface historic properties not already disturbed by previous construction

Based on the information provided and the proposed scope of work, **SHPD concurs** with the ENV's project effect determination of "No historic properties affected" for the current construction and site improvements project at the Kawailoa Transfer Station. Pursuant to HAR §13-275-7(e), when the SHPD agrees that the action will not affect any significant historic properties, this is the SHPD's written concurrence and HRS 6E historic preservation review ends.

SHPD hereby notifies the ENV that the HRS 6E historic preservation review process is ended. Project initiation may proceed.

The document titled, *Archaeological Literature Review and Field Inspection for Construction and Site Improvements at Kawailoa Transfer Station, Kawailoa Ahupua'a, Waialua District, O'ahu TMK: [1] 6-1-005:018 por.* (Gross et al., November 2020) serves to facilitate project planning and supports the historic preservation review process. Please send one hard copy of the document clearly marked FINAL, along with a copy of this review letter and a text-searchable PDF version of the document to the Kapolei SHPD office, attention SHPD Library. Please send a text-searchable PDF copy of the literature review and field check (Gross et al., November 2020) to SHPD via HICRIS to Project 2020PR35019 using the Supplemental Attachment option and another PDF copy to Lehua.K.Soares@hawaii.gov.

Please note on relevant construction plans: In the unlikely event that subsurface historic resources, including human skeletal remains, structural remains, cultural deposits, artifacts, sand deposits, or sink holes are identified during the demolition and/or construction work, cease work in the immediate vicinity of the find, protect the find from additional disturbance, and contact the State Historic Preservation Division, at (808) 692-8011.

Please contact Samantha C. Hemenway, O'ahu Island Archaeologist, at Samantha.Hemenway@hawaii.gov or at (808) 692-8011 for questions regarding this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Josh Nagashima, josh.nagashima@honolulu.gov
Ryan Goss, rgross@garciaandassociates.com

FINAL–Literature Review and Field Inspection for Construction and Site Improvements at the Kawailoa Transfer Station, Kawailoa Ahupuaʻa, Waialua District, Island of Oʻahu, Hawaiʻi

TMK (1) 6-1-005:018 (por.)

Prepared For:

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Hawaiʻi SHPD Permit No. 20-19

KLF/GANDA Report No. 2437-1

18 March 2021

MANAGEMENT SUMMARY

Kleinfelder/GANDA conducted a literature review and field inspection for a portion of Tax Map Key parcel (1) 6-1-005:018, Kawailoa Ahupuaʻa, Waialua District, Island of Oʻahu, Hawaiʻi. This literature review is intended to support an Environmental Assessment being prepared for proposed construction and site improvements at the existing Kawailoa Transfer Station by the City and County of Honolulu Department of Environmental Services. Based on a review of the environmental, cultural, and historical setting of the study area, the results of previous archaeological studies in the vicinity, and historic and modern land alteration within the current study area, historic properties are not likely to be present within the study parcel. Thus, effects to historic properties are not anticipated for the current iteration of the proposed project.

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1.0 INTRODUCTION

At the request of Element Environmental, LLC, and on behalf of the City and County of Honolulu Department of Environmental Services (CCH/ENV), Kleinfelder/GANDA conducted a literature review and field inspection for a portion of Tax Map Key (TMK) parcel (1) 6-1-005:018, located on the Island of Oʻahu, Hawaiʻi. The current study area is the subject of an Environmental Assessment (EA) being prepared for proposed construction and site improvements at the existing Kawailoa Transfer Station by CCH/ENV. The current study will be included as an appendix to the EA for the project and includes background research and a literature review of the study area, including its environmental, cultural, historical, and archaeological contexts. This information is used to generate archaeological expectations regarding the nature of potential cultural, historical, and archaeological resources that may be encountered during project activities, and to offer archaeological recommendations for future development. A field inspection of the study area was conducted by Kleinfelder/GANDA Archaeologist Ryan Gross, MA, RPA, on August 27, 2020.

This report is intended for planning purposes only and does not in itself fulfill Hawaiʻi Revised Statutes 6E-08 historic preservation review requirements for future development, which are dependent on project proponent consultation with the Hawaiʻi State Historic Preservation Division (SHPD).

1.1 Study Area Location

The current study area is owned by the City and County of Honolulu and is located on a portion of TMK (1)-6-1-005:018, Kawailoa Ahupuaʻa, Waialua District, Island of Oʻahu (Figure 1 and Figure 2). The Kawailoa Transfer Station currently operates within the study area, which is comprised of approximately 0.3 hectares (0.72 acres) and is bounded by Kawailoa Drive to the south, the closed Kawailoa Landfill to the north and west, and private land to the east. The current study area is situated on a portion of the parcel surrounding the active Kawailoa Transfer Station.

1.2 Project Description

CCH/ENV is preparing to expand the Kawailoa Transfer Station to handle the collection and storage of green waste. Current project plans include the construction of a second load-out and a permanent office and restroom structure within the study area (Figure 3). Project-associated activities will involve vegetation clearing, minor grading and excavations, and general construction.

1.3 Regulatory Framework

A previous EA (Group 70 International 2002) was prepared for the study area in 2002. The 6E historic preservations review associated with that EA process resulted in a determination of "no historic properties affected." SHPD concurred with this determination (Log No. 28567; Doc No. 0111EJ09), which is included as Appendix A; however, due to the expanded scope of the current project a new EA is required. The current study is being conducted as part of this new EA process.

2.0 BACKGROUND

The following background information establishes the environmental, cultural, and historical setting of the study area and presents a review of previous archaeological research conducted within a 0.5-mile radius from the study area. This information provides a contextual framework for developing archaeological expectations regarding the nature of Traditional and Historic Period resources that may be found in the study area.

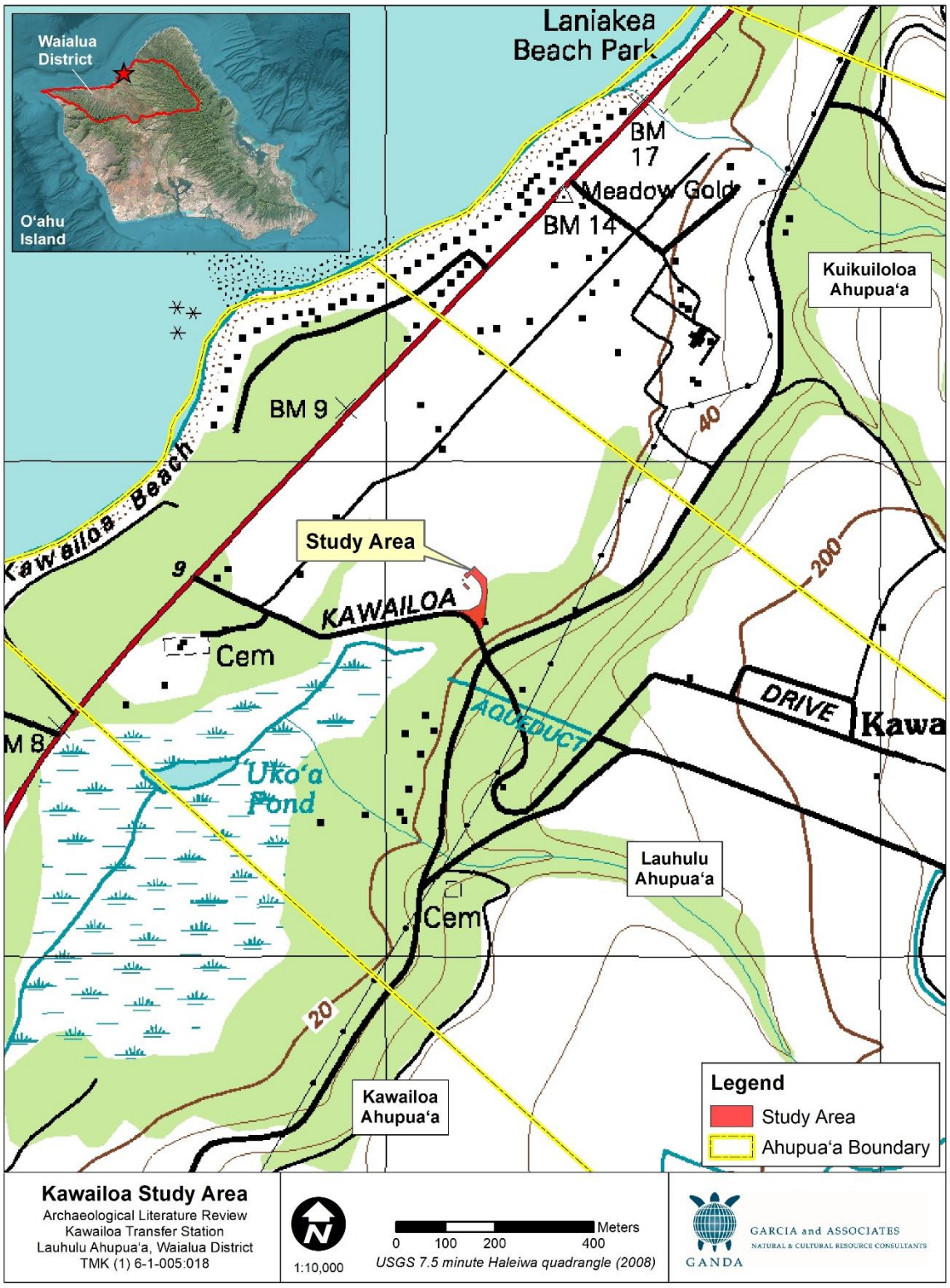

Figure 1. Study area location depicted on USGS (2008) Haleiwa quadrangle.

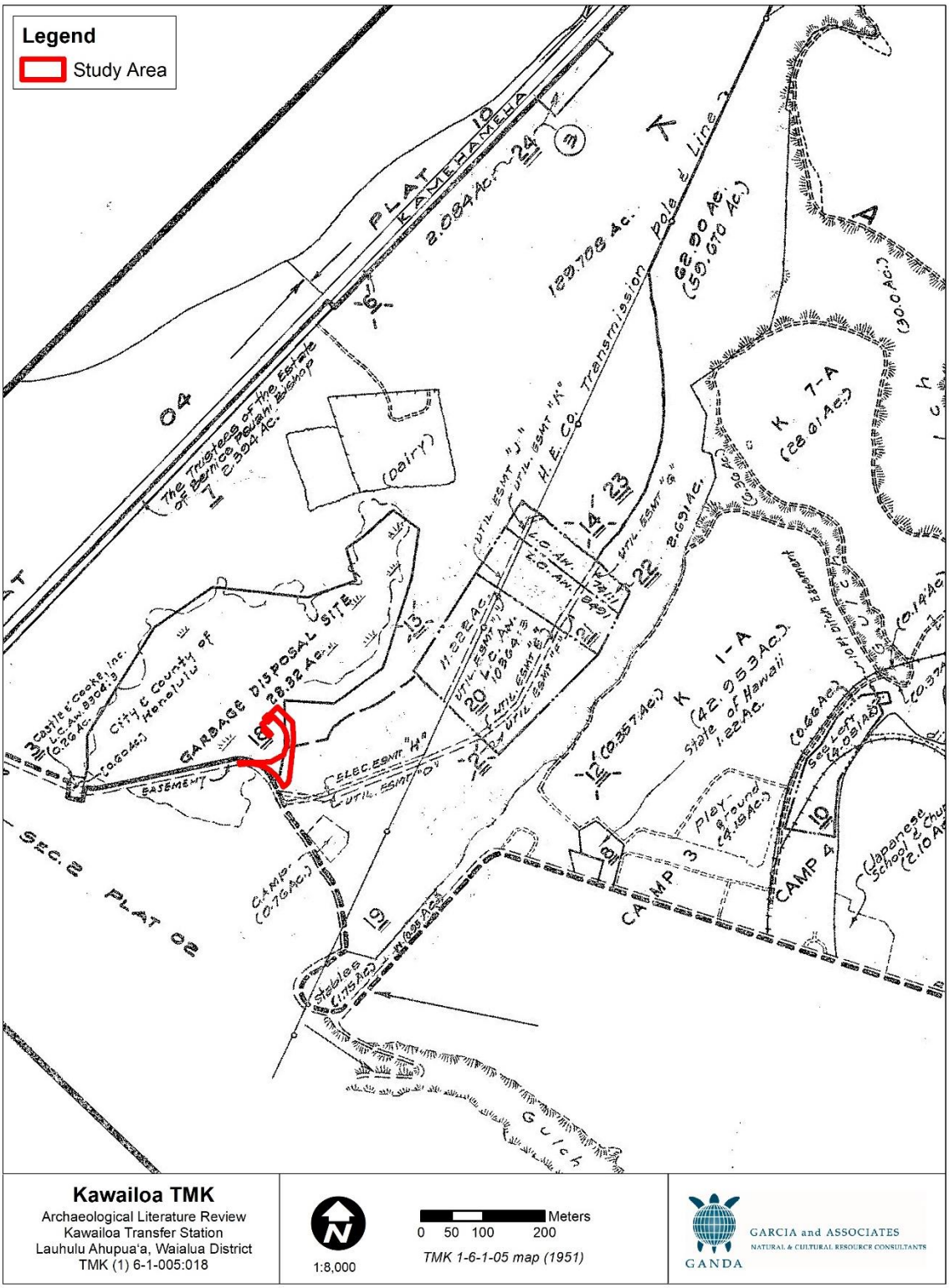

Figure 2. Study area location depicted on TMK plat (1) 6-1-005.

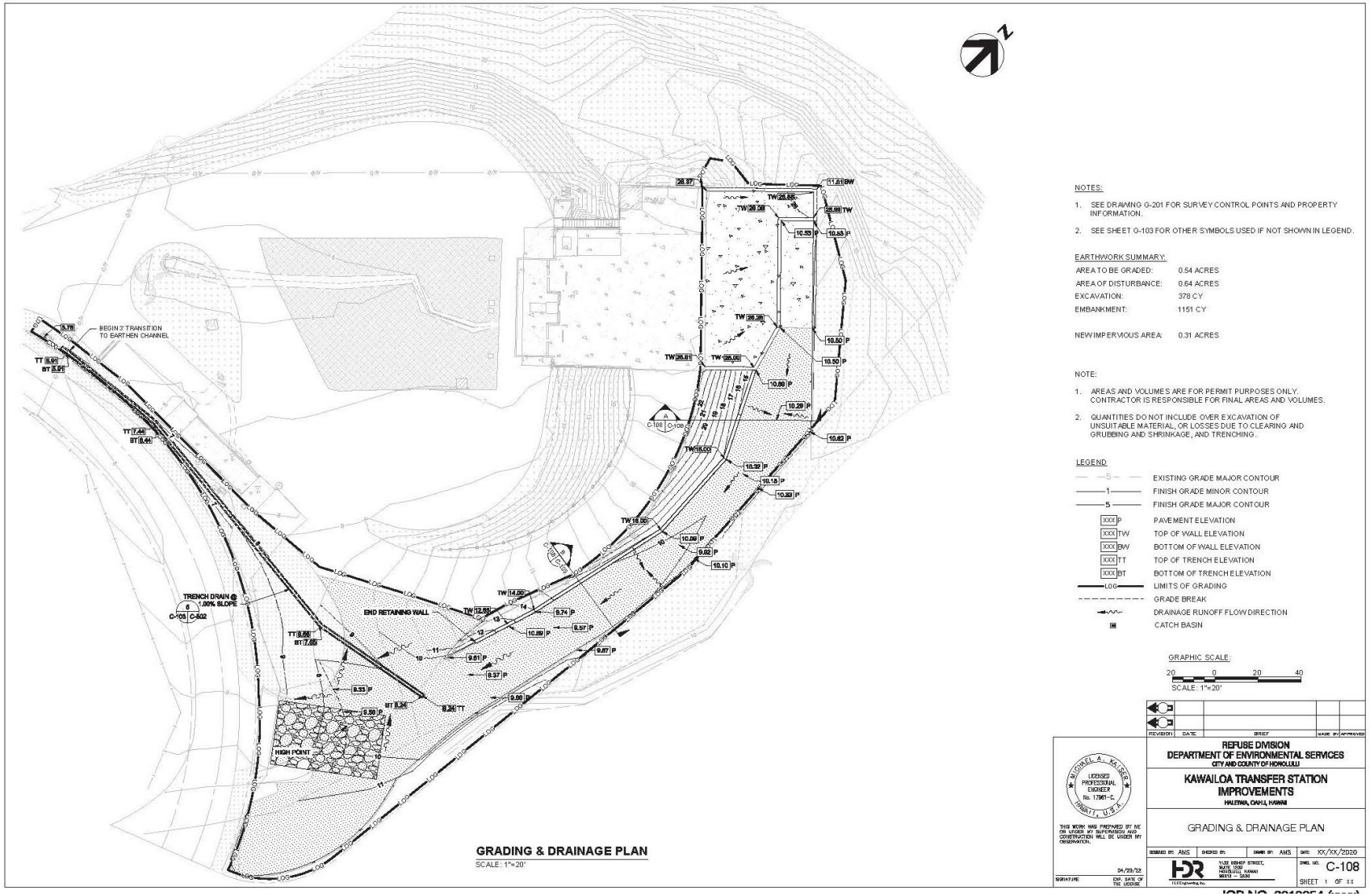

Figure 3. Proposed site grading and drainage plan.

The sections below focus on information that is directly pertinent to the study area. Extensive backgrounds covering the broader Kawailoa region surrounding the study area can be found in McElroy and Duhaylonsod (2014) and Rechtman et al. (2011).

2.1 Environmental Context

The study area is located on the interior coastal plain fronting Oahu's north shore at an elevation of 3.0 to 3.7 meters (10 to 12 feet) above mean sea level. Elevations increase gradually to the southeast which give way to dissected tablelands along the base of the western slope of the Koʻolau Range. Annual temperatures range from around 65 to 85 degrees Fahrenheit, with median annual rainfall reported as just under 100 centimeters (40 inches).

The study area is situated roughly 700 meters from the shoreline, and the majority of the study area's soils are mapped within Waialua stony silty clay, 3 to 8 percent slopes (Figure 4). This soil unit is a moderately well-drained soil found on alluvial fans with low runoff and the water table at more than 203.2 centimeters (80 inches) below surface. The soil profile is typically 0 to 30.5 centimeters (0 to 12 inches) of stony silty clay over 30.5 to 152.4 centimeters (12 to 60 inches) of silty clay. If irrigated, this soil makes excellent farmland (Soil Survey Staff 2020). Portions of the western study area extend into an area mapped as Coral Outcrop, an excessively drained soil with low runoff that is found near beaches and toeslopes (Soil Survey Staff 2020).

2.2 Pre-Contact Land Use

The study area's most significant traditional Hawaiian association is its immediate proximity to ʻUkoʻa Fishpond. According to Hawaiian *moʻolelo*, this freshwater fishpond was occupied by the goddess Laniwahine (a *moʻo*, or lizard) and her brother Puhiula. Traditional accounts of Laniwahine and ʻUkoʻa can be found in Sterling and Summers *Sites of Oahu* (Kamakau in Sterling and Summers 1978: 120; Manu in Sterling and Summers 1978:10). ʻUkoʻa Fishpond was and remains an important cultural place, also significant for its economic output of fish, and was in use at the time of McAllister's 1930 island-wide survey (McAllister 1933:141–142). As Kirch and Sahlins note, "ʻUkoʻa Pond was an important aquacultural resource in the political economy of the ruling chiefs" (Kirch and Sahlins 1992:19).

Following the decline and collapse of both the traditional Hawaiian subsistence economy and the chiefly system of centralized taro and fish production, large ponds like ʻUkoʻa fell into disuse. Continued Hawaiian interest in the area, however, is attested to by the density of Land Claim Awards (LCAs) along the nearby coast and along the southeast side of ʻUkoʻa Pond.

2.3 The Māhele and Land Tenure Change

As a result of the Māhele, a large number of land claims were made in Kawailoa lands, both in coastal and near-*mauka* areas. Lands surrounding ʻUkoʻa Fishpond (Hawaiʻi State Inventory of Historic Places [SIHP] 50-80-04-00236) were no exception and the current subject parcel was labeled Konohiki lands on the LCA testimony sketch maps. These lands ultimately were awarded to Victoria Kamamalu under LCA 7713:33, along with most of Kawailoa Ahupuaʻa (Figure 5).

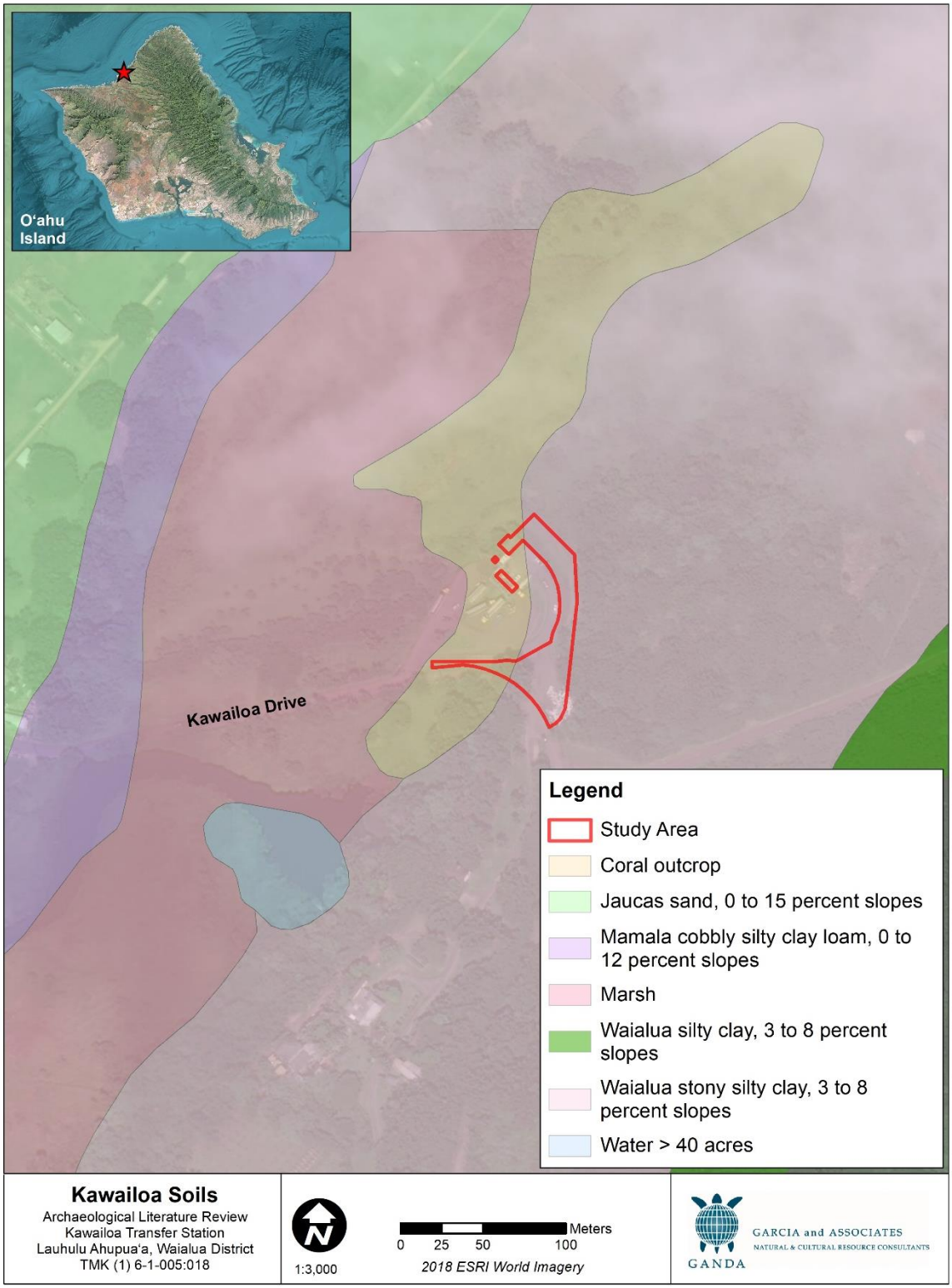

Figure 4. Study area location depicted on soils map.

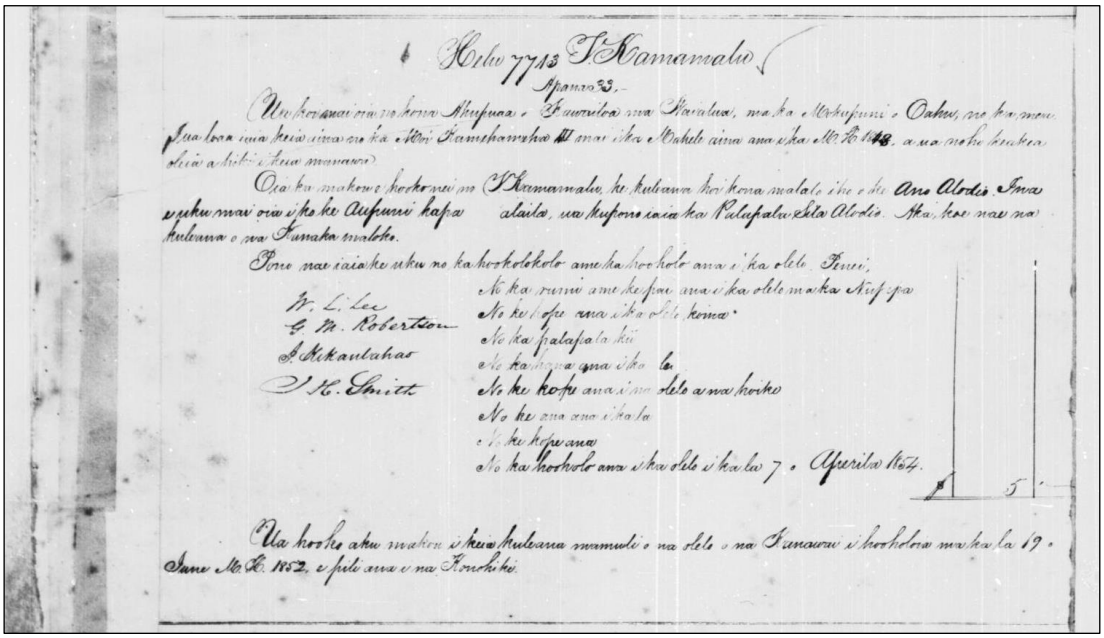

Figure 5. LCA claim 7713:33 for study area.

2.4 Historic Land Use and Agricultural Development

By the turn of the twentieth century, and probably much earlier, the coastal plain on the *mauka* side of Kamehameha Highway was used for pasture by Kawailoa Ranch, while the upland portions of Kawailoa—the *kula* lands between the large drainages—were used for sugarcane production. Historical use of the upland areas is not directly relevant to the current study, except in the fact that Kawailoa Drive, which passes directly south of the study area, provided an important access route to the sugarcane fields. The road is not depicted on Wall's 1901 map of the Waialua Agricultural Company (Figure 6), and access to the cane fields at that time was provided by the Oahu Railway and Land Company (OR&L) railroad, which was situated just east of the current study area. By 1929, Kawailoa Drive is well established, as depicted on a 1929 USGS topographic map (Figure 7).

For most of the twentieth century, the dominant land use in the vicinity of the current study area has been associated with the Meadow Gold Dairy, formed in 1897 as the Dairymen's Association. While the earliest use of the area for pasture land is not known, "Kawailoa Ranch" appears on Wall's 1901 map (see Figure 6), and by at least 1957, the Dairymen's Association had established the area as their base of operations. Records are unclear but judging from the presence of the dairy on maps before 1957, it is very likely that dairy farming had a long history there, dating possibly as far back as the formation of the Dairymen's Association. In 1959, the Dairymen's Association became Meadow Gold Dairy, which was subsequently acquired by Beatrice Foods in 1986, Dean Foods in 2001, and in May 2020, by the Dairy Farmers of America.

As depicted on historical maps (see Figure 6 and Figure 7) and on a later 1940 map of U.S. Army 8-inch coastal artillery positions (Figure 8), the current study area was situated within swamp (or "swampy") land, which was eventually filled in by the Meadow Gold Dairy (Desilets and Sims 2015:5). Archaeological test excavations conducted by Garcia and Associates in 2015 confirmed the presence of such fill on an adjacent parcel to the west (Desilets and Sims 2015).

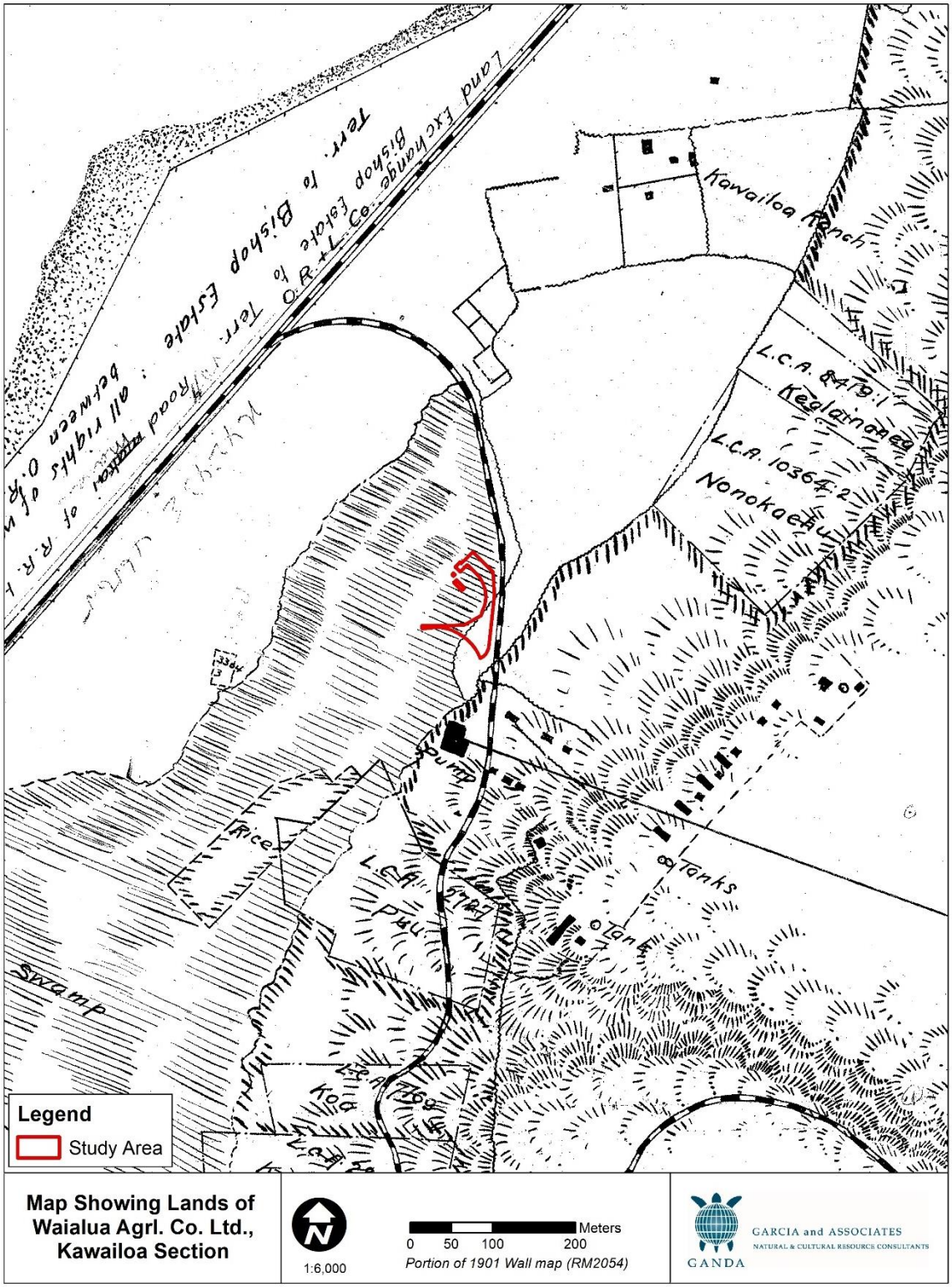

Figure 6. Study area location depicted on Wall's (1901) map.

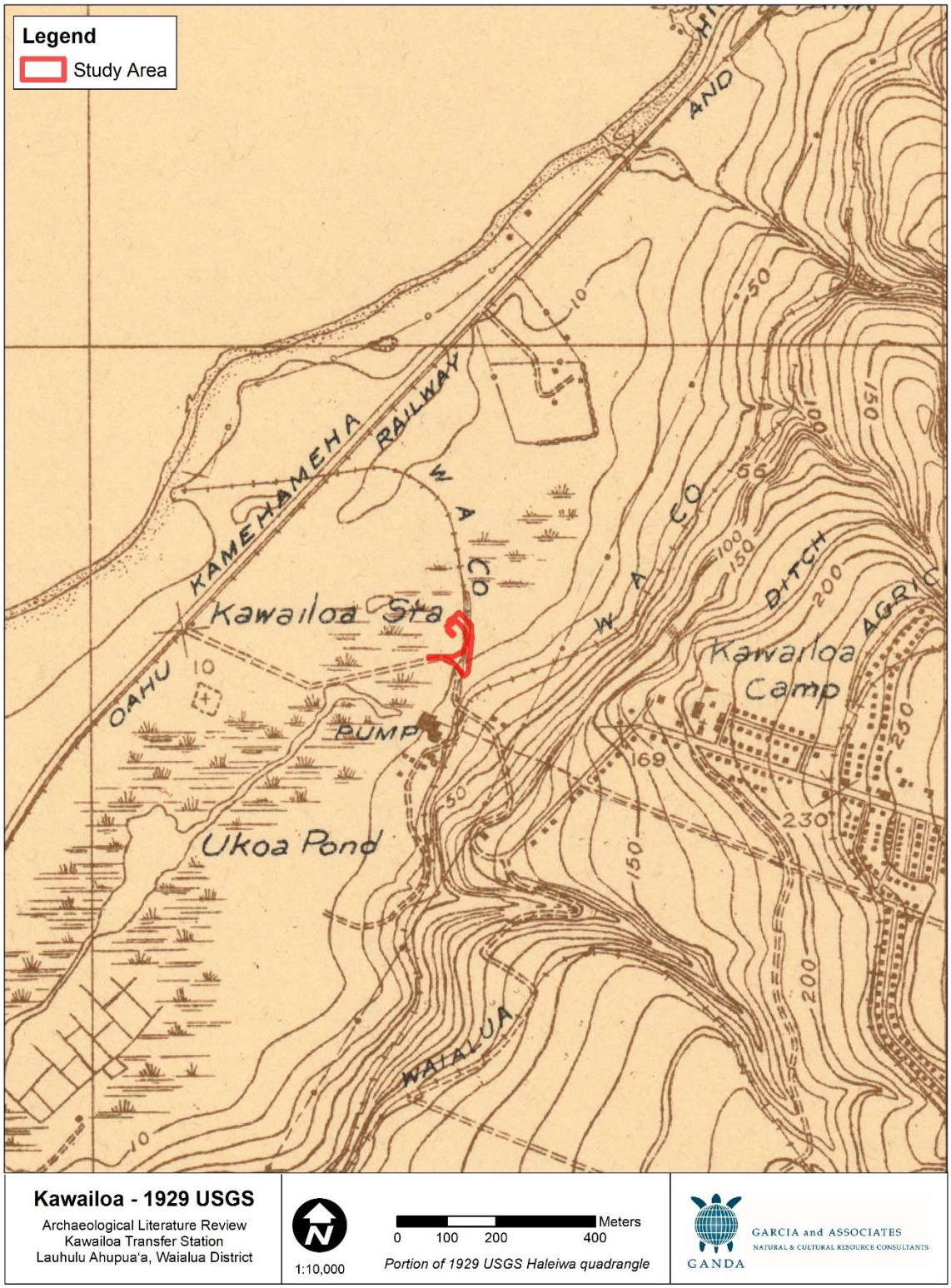

Figure 7. Study area location depicted on USGS (1929) Haleiwa quadrangle.

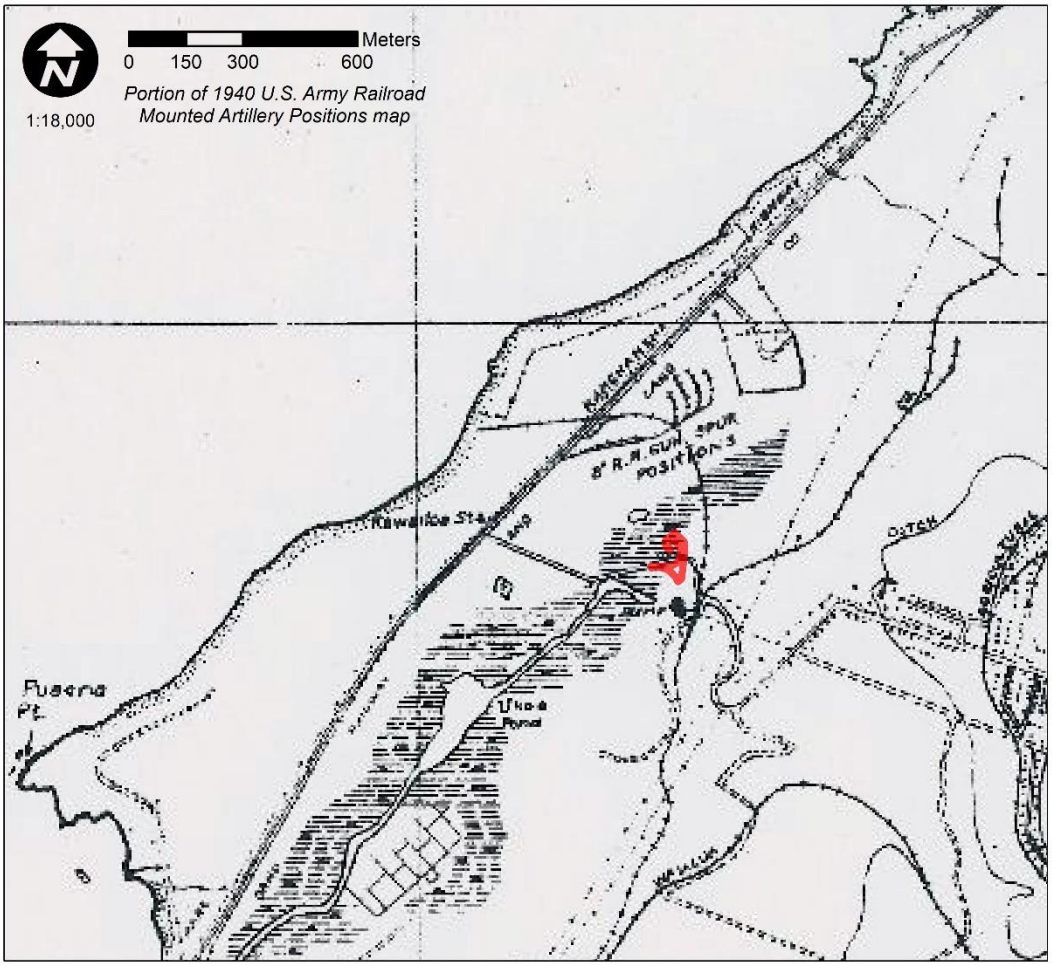

Figure 8. Study area location depicted on US Army (1940) map.

While dairy operations continued in the vicinity into the 1980s, the parcel containing the current study area became the Kawailoa Landfill, which operated from 1954 to 1987. The construction of the landfill included immense alterations to the study parcel including mass grading, construction of large berms, and the import of massive amounts of fill material (Figure 9 and Figure 10). While the landfill is now capped, the associated Kawailoa Transfer Station, itself constructed on imported fill material, has continued to serve local residents as a drop off location for rubbish and recyclables.

2.5 Previous Archaeological Investigations

Several previous archaeological studies have been conducted in the vicinity of the current study area (Figure 11; Table 1). The first systematic archaeological survey of O‘ahu was conducted in 1930 by J. Gilbert McAllister. His resulting publication, *Archaeology of Oahu*, identified ‘Uko‘a Pond (SIHP 50-80-04-0236) as an important cultural site located in the immediate vicinity of the study area:

> One of the two Waialua ponds; still in use. It is a long narrow fresh-water pond, approximately a mile in length. Most of it now overgrown with weeds. Laniwahine was the goddess (moo) of Ukoa and lived there with her brother

Figure 9. Overview from northeastern portion of study area showing earthworks leading to existing load-out facility, view to the south.

Figure 10. Overview of proposed new load-out construction area showing existing load-out earthworks on left and landfill berm on right, view to the northwest.

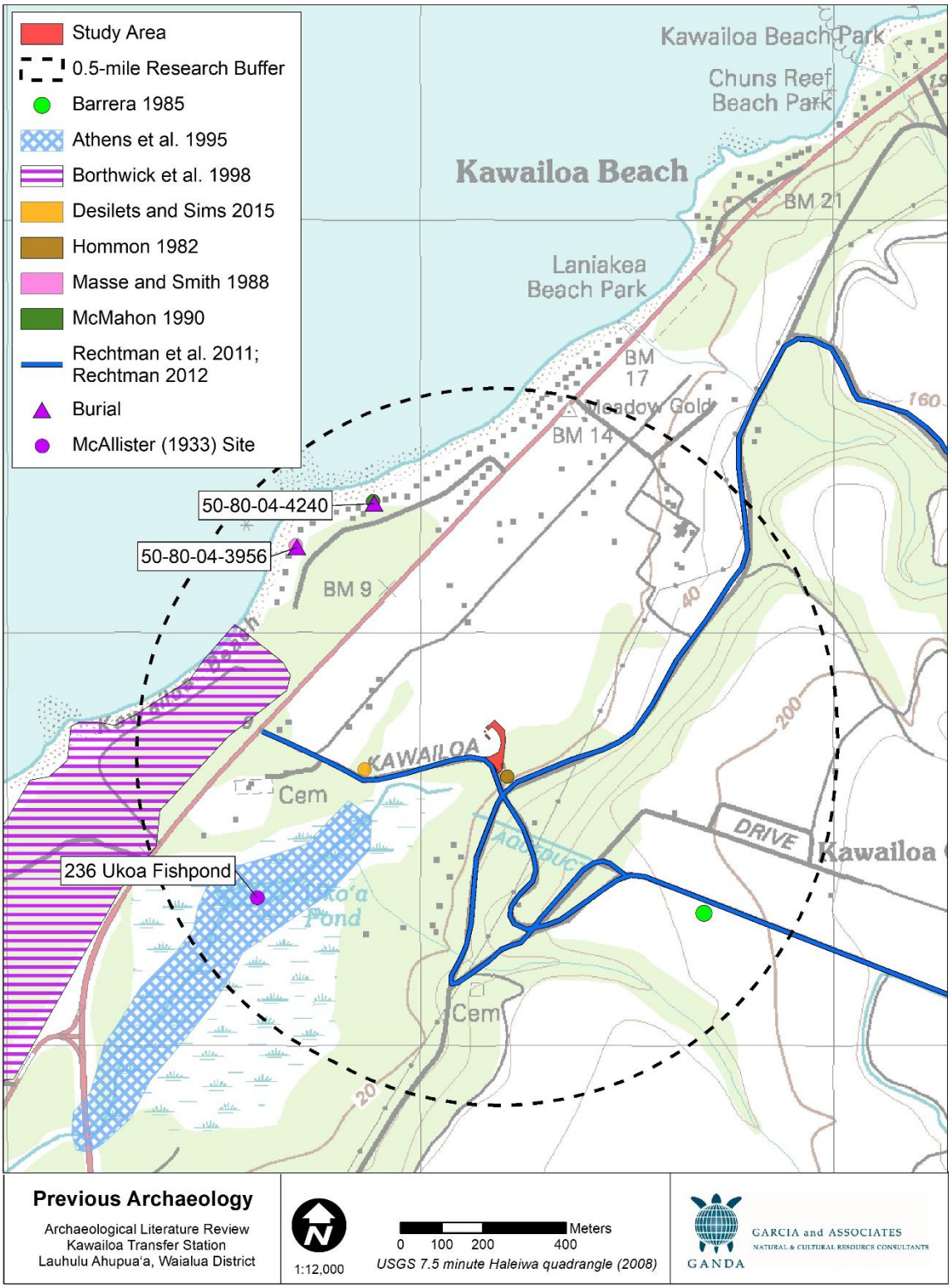

Figure 11. Previous archaeological studies conducted within 0.5 mile of the study area.

Table 1. Summary of Previous Archaeological Studies within 0.5 Mile of the Study Area

Reference	*Location*	*Investigation*	*Results*
McAllister 1933	O‘ahu Island	Archaeological Survey	‘Uko‘a Pond (SIHP 50-80-04-0236) identified.
Hommon 1982	Waialua-Haleiwa Wastewater Facilities	Archaeological Reconnaissance Survey	Stone enclosure/pavement, SIHP 50-80-04-3400.
Barrera 1985	TMK (1) 6-2-009:001	Archaeological Reconnaissance Survey	No historic properties identified.
Masse and Smith 1988 / Erkelens et al. 1989	TMK (1) 6-1-004:093	Burial Disinterment	Human remains, SIHP 50-80-04-3956.
McMahon 1990	TMK (1) 6-1-004:081	Burial Disinterment	Human remains, SIHP 50-80-04-4240.
Athens et al. 1995	‘Uko‘a Pond	Paleoenvironmental Research	Coring provided a record of sediments spanning 8,000 years. Lowland forests rapidly declined around AD 950.
Borthwick et al. 1998	TMK (1) 6-1-004:023, 058 and (1) 6-2-001: 001, 010	Archaeological Inventory Survey	Identified Sites 5641 and 5643, World War II remains; 5495, a human burial; 5644, a historic trash dump; 5661, a cultural layer; and 235, Puaena Stone.
Rechtman et al. 2011	Kawailoa Windfarm	Archaeological Inventory Survey	Identified 17 historic properties: Sites 7155, 7156, and 7158 are military related, while Sites 7157 and 7159 to 7171 are associated with former plantation activities. An additional 20 temporary sites were identified but not given state site numbers: enclosures, walls, concrete and rock foundations, terraces, a platform, a pathway, and a Japanese cemetery.
Rechtman 2012	Kawailoa Windfarm	Archaeological Monitoring	Additional historical *mauka* properties identified, but no findings near current study area.
Desilets and Sims 2015	TMK (1) 6-1-005:003	Archaeological Assessment	No historic properties identified.

Puhiula. Between the pond and the sea was a tunnel through which Laniwahine passed when she wished to bathe in the ocean. Offerings were left for her on a stone, located near Pump Number 4 of the Waialua Agricultural Company. The site of this stone was marked for many years by a dead tree which was not removed because of its association with Laniwahine. Now neither stone nor tree is to be found.

This is the pond to which Lehuanui was sent by Oahunui to obtain fish. Here Lehuanui and his retainers found “the fish packed thick at the makaha and were soon busily engaged in scooping out, cleaning and salting them.” [McAllister 1933:142]

Following the passage of cultural resources legislation and the advent of cultural resource management, more formal archaeological studies of Kawailoa Ahupuaʻa began in the 1980s. In 1982, Science Management Inc. conducted an archaeological survey for the Waialua-Haleiwa Wastewater Facilities System (Hommon 1982). A small portion of that study's survey area (SPS-5) included the Kawailoa Wastewater Treatment Plant, located near the intersection of Kawailoa Drive and Cane Haul Road (now Hakina Bypass Road), directly southeast of the current study area (see Figure 11). One archaeological site (SIHP 50-80-04-3400) was identified during that study, consisting of two wall segments totaling approximately 130 meters in length, constructed of dry-stacked stone, and connected to a stone platform. The site was interpreted as a possible enclosure and associated structural foundation. No surface artifacts were observed within Site 3400, and the age or function of the site could not be determined (Hommon 1982). The author recommended detailed mapping and test excavations at the site if it would be impacted by project activities, but it appears that impacts were avoided and no further work was conducted.

In 1985, Chiniago, Inc. conducted an archaeological survey for a proposed well located approximately 600 meters from the current study area (see Figure 11). The well site was located within an active sugarcane field, and while no archaeological sites were identified during that study (Barrera 1985), archaeological monitoring was recommended for the well construction.

Two human burials were inadvertently discovered along the coast to the northwest of the current study area (see Figure 11). Masse and Smith (1988) reported one set of human remains (SIHP 50-80-04-3956) initially identified during excavation of a trench at 61-795 Papailoa Road, approximately 700 meters northwest of the study area. The burial was mostly complete and found in a loosely flexed position with a possible capping of glomerate coral fragments (Masse and Smith 1988:4). Subsequent osteological analysis indicated the remains represented a middle-aged Hawaiian male (Erkelens et al. 1989). In 1990, another set of human remains (SIHP 50-80-04-4240) was discovered during excavations on Papailoa Road within the same housing development, which were reported on by SHPD Archaeologist Nancy McMahon (McMahon 1990).

Paleoenvironmental studies were conducted near the study area (see Figure 11) at ʻUkoʻa Pond (SIHP 50-80-04-0236) in support of the Haleiwa Bypass Highway Project (Athens et al. 1995). Core samples were analyzed for pollen, charcoal, and sediments, and provided a sequence of environmental change spanning approximately 8,000 years and divided into four time periods. Within a 300-year time period between 1,000 and 500 years ago, open scrubland completely replaced the lowland forest. Human settlement is thought to have begun at roughly AD 950 when this change in the pollen record occurred (Athens et al. 1995:119).

Borthwick et al. (1998) conducted an archaeological inventory survey with subsurface testing on a 140-acre parcel which included Puaena Point Beach Park, located 600 meters west of the study area (see Figure 11). Five new archaeological sites were identified: SIHP 50-80-04-5641 and -5643 (World War II structural remnants), SIHP 50-80-04-5495 (a human burial), SIHP 50-80-04-5644 (a historic trash dump), and SIHP 50-80-04-5661 (a subsurface cultural layer). One site was relocated, McAllister's Site 235, the Puaena Stone. This healing stone was originally noted by McAllister at Puaena Point (McAllister Site 234) and was described as a smooth, oval stone, partially covered by sand, and representing a woman named Puaena.

Between 2010 and 2011, an archaeological inventory survey was conducted by Rechtman Consulting (Rechtman et al. 2011) for the Kawailoa Wind Farm Project. The majority of that study's project area was located on the tablelands more than two miles east of the current study area; however,

several access roads to the proposed wind farm area were also surveyed, including Kawailoa Drive, adjacent to the current study area (see Figure 11). Eight former plantation features near the current study area were designated with SIHP numbers. These include a ditch complex (SIHP 50-80-04-7159), stone abutments (SIHP 50-80-04-7160), concrete foundations (SIHP 50-80-04-7161), a kerbstone alignment (SIHP 50-80-04-7162), a stone/concrete culvert (SIHP 50-80-04-7165), and a metal pipeline (SIHP 50-80-04-7164) (Rechtman et al. 2011:48–49). Hommon's (1982) Site 3400 was relocated. Seventeen additional sites were identified but not given site numbers as they were outside of the survey area. These include a stone and concrete pedestal (T-10); a concrete slab foundation (T-15); and a cluster of eight sites including a terraced platform, a slab paved pathway, three small enclosures, and three short wall segments (T-13, T-14, T-16, T-17, T-18. T-19, T-20, T-21). Also identified was a cluster of seven sites including a set of parallel terrace walls, three soil and rock terraces, and three stone and concrete foundations (T-23, T-24, T-25, T-26, T-27, T-28, T-29) (Rechtman et al. 2011:49, 60). Rechtman Consulting also completed archaeological monitoring for the project the following year (Rechtman 2012), which included roadway widening and improvements on Kawailoa Drive fronting the current study area (see Figure 9). Although some new plantation-associated sites were identified in the *mauka* areas of that study, no new archaeological sites or artifacts were found near the current study area.

Garcia and Associates conducted an archaeological assessment (Desilets and Sims 2015) in 2015 that included subsurface testing on a privately-owned parcel approximately 300 meters west of the current study area (see Figure 11). A pedestrian survey and excavation of 14 archaeological test pits did not identify any cultural deposits or historic properties (Desilets and Sims 2015:21).

3.0 Predictive Model and Recommendations

The following section provides a summary of archaeological expectations and recommendations based on a review of the environmental, cultural, historical, and archaeological setting of the current study area.

3.1 Archaeological Expectations

Based on the historic and modern land alteration within the current study area, there is an extremely low probability of encountering traditional Hawaiian, early post-Contact Hawaiian, or Historic Period deposits during project construction activities. While there is a possibility that historic land use associated with dairy pasture improvements (i.e., filling of wetlands) may have disturbed or capped these older types of deposits, the more recent construction of the Kawailoa Landfill and Transfer Station has completely altered the study area, including massive earthworks to construct the landfill berms and existing load-out facilities. A field inspection of the study area was conducted by Kleinfelder/GANDA Archaeologist Ryan Gross, MA, RPA, on August 27, 2020, which noted heavy disturbances within the study area (see Figures 9 and 10).

3.2 Recommendations

While the possibility of encountering historic properties within the study area cannot be entirely ruled out, based on a review of the environmental, cultural, and historical setting of the current study area, and the results of previous archaeological studies in the vicinity, no historic properties are likely to be present in the study area. Thus, this study agrees with the findings of the previous 2002 EA (Group 70 International 2002) and SHPD concurrence of that EA's determination (Log No. 28567; Doc No. 0111EJ09) that no historic properties will be affected during the proposed project. This study recommends no further archaeological work for the project. However, should historic properties be inadvertently discovered during project construction, SHPD should be immediately notified.

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APPENDIX A: SHPD LETTER (LOG NO. 28567; DOC NO. 0111EJ09)

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

GILBERT S. COLOMA-AGARAN, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DEPUTIES
JANET E. KAWELO
LINNEL NISHIOKA

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS

HAWAI'I HISTORIC PRESERVATION
DIVISION REVIEW

Log #:28567
Doc #:0111EJ09

To: Jeff Overton
Name of Agency/Applicant: Group 70 International, Inc.
Address of Agency/Applicant: 925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

SUBJECT: Draft Environmental Assessment (DEA) and Special Management Area Use Permit for the City and County of Honolulu Kawailoa Transfer Station Green Waste Recycling Improvements

Ahupua'a: Pupukea
District Island: Ko'olauloa, O'ahu
TMK: 6-1-005:018

1. We believe there are no historic properties present, because:

a) intensive cultivation has altered the land ____
b) residential development/urbanization has altered the land ✓
c) previous grubbing/grading has altered the land___
d) an acceptable archaeological assessment or inventory survey found no historic properties __
e) Other: No archaeological or historical sites are likely to be found due to land alteration from former agricultural use and from the existing developed landfill.

Thus, we believe that "no historic properties will be affected" by this undertaking ✓.

2. This project has already gone through the historic preservation review process, and mitigation has been completed ___.

Staff: Elaine Jourdane Date: 11/13/01

Title: Assistant Archaeologist - O'ahu
Phone: (808) 692-8027

c: Wilma Namumnart, C&C of Honolulu, Department of Environmental Services, Refuse Division, 650 S. King Street, 6th Floor, Honolulu, HI 96813
Genevieve Salmonson, Director OEQC, 235 S. Beretania St., Suite 702, Honolulu, HI 96813

Appendix D

Traffic Assessment Kawailoa Transfer Station Improvements

TRAFFIC ASSESSMENT
KAWAILOA TRANSFER STATION IMPROVEMENTS
HALEIWA, OAHU, HAWAII

FINAL

March 16, 2021

Prepared for:

Element Environmental, LLC
98-030 Hekaha St. #9
Aiea, Hawaii 96701

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Civil Engineers • Surveyors
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Honolulu • Wailuku • Hilo, Hawaii

TRAFFIC ASSESSMENT
KAWAILOA TRANSFER STATION IMPROVEMENTS

Haleiwa, Oahu, Hawaii

FINAL

Prepared for

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98-030 Hekaha St. #9
Aiea, Hawaii 96701

Prepared by
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Civil Engineers • Surveyors
Honolulu • Wailuku • Hilo, Hawaii

March 16, 2021

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AUSTIN, TSUTSUMI & ASSOCIATES, INC. CIVIL ENGINEERS • SURVEYORS
CONTINUING THE ENGINEERING PRACTICE FOUNDED BY H. A. R. AUSTIN IN 1934

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TRAFFIC ASSESSMENT

Kawailoa Transfer Station Improvements

Haleiwa, Oahu, Hawaii

1. INTRODUCTION

This report documents the findings of a traffic study conducted by Austin, Tsutsumi, and Associates, Inc. (ATA) to evaluate the traffic impacts resulting from the proposed Kawailoa Transfer Station Improvements (hereinafter referred to as the "Project") located in Oahu, Hawaii.

1.1 Project Description

The Project site is located mauka of Kamehameha Highway in Haleiwa and is currently an active transfer station operating daily between 7:00 AM and 6:00 PM. The facility is currently operated by four (4) active employees and the primary customers are the City's Laie and Waialua Refuse Collection Yards and residential self-haulers. Majority of the Project site is located within the Special Management Area (SMA) surrounding Ukoa Pond and the North Shore coastline.

The Project involves expanding the Kawailoa Transfer Station to handle the collection and storage of green waste, which is anticipated to include building a second load-out, permanent office, and restroom (including a holding tank). Development of the site will involve vegetation clearing, minor grading and excavation, and general construction.

Access to the Project site will continue to be provided via the existing driveway along Kawailoa Drive. The Project is anticipated to be completed by year 2022. This Traffic Assessment (TA) is expected to be included as part of the Project Environmental Assessment (EA).

See Figure 1.1 for Project Location. See Figure 1.2 for the Project site plan.

1.2 Study Methodology

This study will address the following:

- Assess existing traffic operating conditions during the weekday PM and Saturday midday (WE) peak hours of traffic within the study area.
- Traffic Projections for Base Year 2022 (without the Project).
- Estimate the vehicular trips that will be generated by the Project.

- Traffic projections for the Project for Future Year 2022 (with Project).
- Recommendations for roadway improvements or other mitigative measures, as appropriate, to reduce or eliminate the adverse impacts resulting from traffic generated by the Project.

1.3 Analysis Methodology

Level of Service (LOS) is a qualitative measure used to describe the conditions of traffic flow at intersections, with values ranging from free-flow conditions at LOS A to congested conditions at LOS F. The Highway Capacity Manual (HCM), 6th Edition, includes methods for calculating volume-to-capacity (v/c) ratios, delays, and corresponding LOS that were used in this study. See Appendix A for LOS Criteria.

Analyses for the study intersections were performed using the traffic analysis software Synchro, which is able to prepare reports based on the methodologies described in the HCM. These reports contain control delay results as based on intersection lane geometry, signal timing, and hourly traffic volumes. Based on the vehicular delay at each intersection, a LOS is assigned to each approach and intersection movement as a qualitative measure of performance. These results constitute the technical analysis that will form the basis of the recommendations outlined in this report.

1.4 Study Intersections

Due to their proximity to the Project site, the following intersections were evaluated as part of this study:

1. Kamehameha Highway/Kawailoa Drive
2. Kawailoa Drive/Kawailoa Transfer Station Driveway

KAWAILOA TRANSFER STATION IMPROVEMENTS TA

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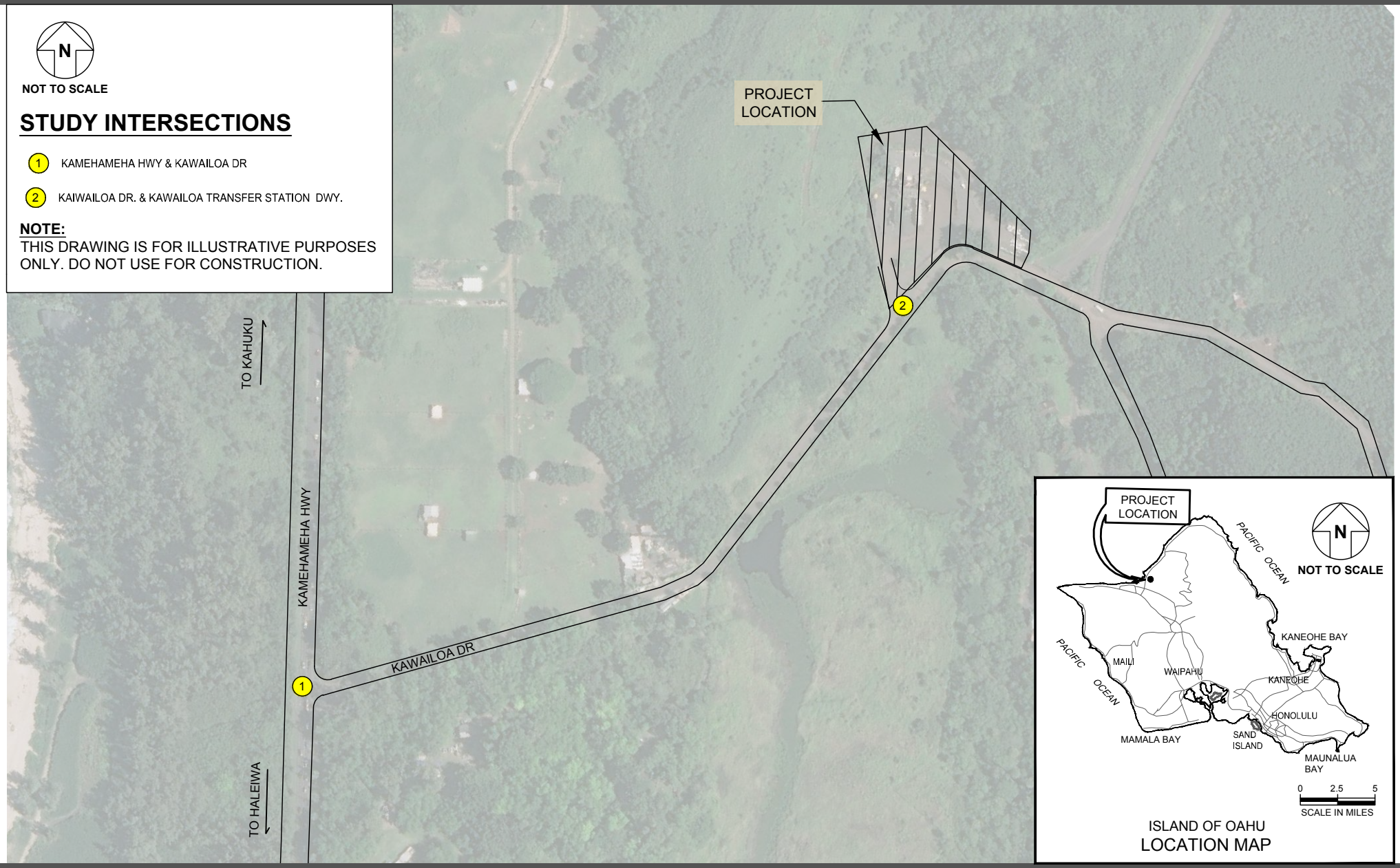

FIGURE 1.1

PROJECT MAP

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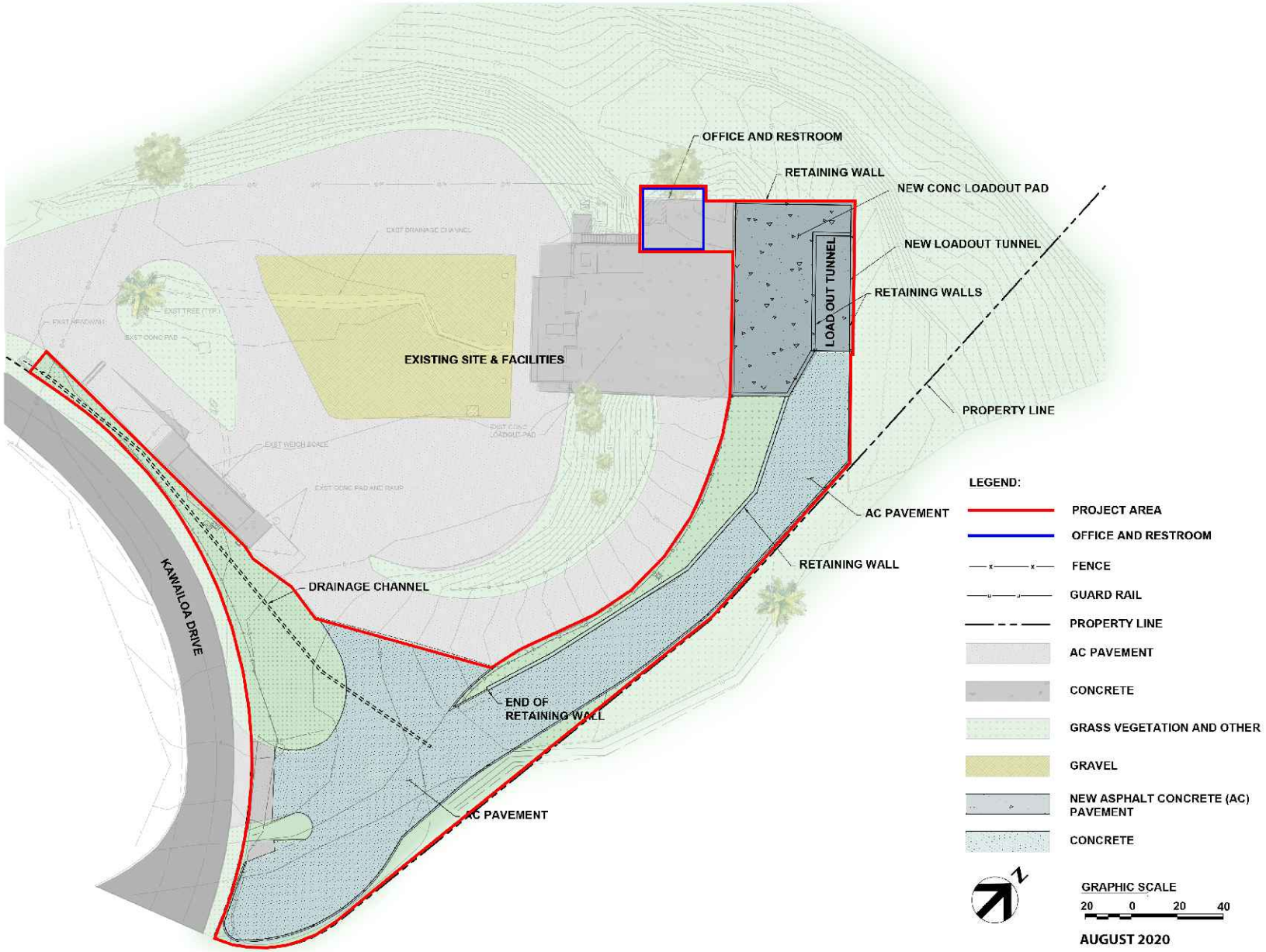

FIGURE 1.2

SITE PLAN

2. EXISTING CONDITIONS

2.1 Roadway System

The following are brief descriptions of the existing roadways studied within the vicinity of the Project:

Kamehameha Highway (Route 83) is generally a north-south, two-way, two-lane, undivided State roadway and is part of the National Highway System (NHS). Kamehameha Highway is principal arterial roadway that provides regional connectivity along the windward coast between Kaneohe and Haleiwa. The posted speed limit on Kamehameha Highway is 35 miles per hour (mph) in the vicinity of the Project.

Kawailoa Drive is generally a two-way, east-west, County roadway with no posted speed limit. This roadway provides access to Kawailoa Transfer Station and residential areas.

2.2 Existing Traffic Volumes

Due to the prolonged disruptions to both residential and visitor traffic in the Haleiwa region as a result of the impacts of COVID-19, instead of collecting new traffic count data, most recently available traffic volume data from the Hawaii Department of Transportation (HDOT) and existing land uses were used to estimate the existing 2020 traffic volumes at the study intersections. Observations of existing conditions in the study area were also not conducted as part of this study as a result of the atypical traffic conditions.

HDOT collected 24-hour traffic volume data on various weekdays between 2014 and 2019 at the following locations:

- Kamehameha Highway between Pohakuloa Way and Punalau Place (Coverage – Class Station)
- JP Leong Highway south of Kamehameha Highway (Permanent – Class Station)

Based on the collected data, the weekday PM peak hour of vehicular traffic was generally observed to occur from 3:30 PM to 4:30 PM.

The HDOT data provided does not include an hourly breakdown of Saturday traffic volumes. Thus, the permanent traffic counting station on JP Leong Highway, which collects traffic volumes all year round, was used to determine the appropriate adjustment factor to apply to the PM peak hour volumes to estimate the WE peak hour volumes. Based on previous traffic studies completed in the Haleiwa area, the Saturday WE peak hour of vehicular traffic was generally observed to occur between 12:00 PM and 2:00 PM.

The existing 2020 traffic volumes used in this analysis are based on the HDOT traffic volumes collected in 2019. It is our understanding, that there were no new developments in the vicinity of the Project that would have a significant impact on traffic. However, to be conservative an annual ambient growth rate of 2.6%, which is based on recent (2014-2019) HDOT traffic volumes within the study area, was applied to the through movements along Kamehameha Highway to represent traffic growth between year 2019 and 2020.

City and County of Honolulu (C&C) Department of Environmental Services (ENV) provided existing daily trip estimates for the Kawailoa Transfer Station. C&C ENV estimates that roughly

200 household trips and four (4) transfer trailer trips to/from the Kawailoa Transfer Station occur each day. Traffic volume data were collected at the Ewa Convenience Center on Tuesday August 25, 2020 and Saturday August 29, 2020. The daily trip distribution at the Ewa Convenience Center was used to estimate the proportion of the existing 200 daily household trips to/from the Kawailoa Transfer station that occur during the PM and WE peak hours of traffic. To be conservative, all four (4) employee trips were also assumed to occur during the PM and WE peak hours of traffic. Turning movement volumes at the study intersections were generally based upon the average 2014 to 2019 HDOT traffic volume distribution.

Traffic volume data is provided in Appendix B.

2.3 Existing Intersection Analysis

All movements at the Study Intersections currently operated at LOS D or better during the PM and WE peak hours of traffic.

Table 2.1 shows a summary of the existing delay, v/c ratio, and LOS. Figure 2.1 shows the existing traffic volumes and lane configuration at the study intersections. LOS worksheets are provided in Appendix C.

Table 2.1: Existing Conditions LOS Summary

Intersection	Existing 2020 Conditions					
	PM			WE		
	Delay	v/c Ratio	LOS	Delay	v/c Ratio	LOS
1. Kamehameha Highway/Kawailoa Drive						
WB LT/RT	28.9	0.17	D	32.1	0.20	D
SB LT	9.3	0.02	A	9.5	0.02	A
2. Kawailoa Drive/Kawailoa Transfer Station Driveway						
EB LT/TH	7.3	0.02	A	7.3	0.18	A
SB TH/LT	8.4	0.03	A	8.5	0.03	A

KAWAILOA TRANSFER STATION IMPROVEMENTS TA

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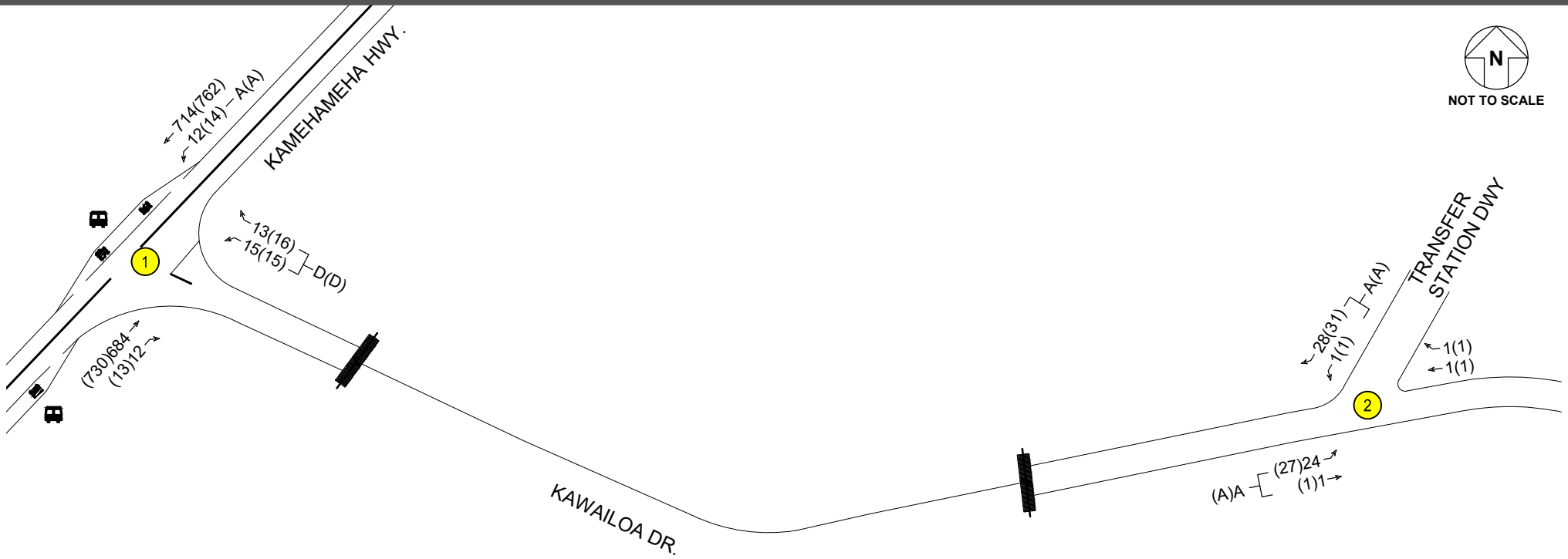

LEGEND

##(##)	-	PM(WE) VEHICLE VOLUMES
X	-	UNSIGNALIZED INTERSECTION X
X(X)	-	PM(WE) LOS
	-	EXISTING BUS STOP

NOTE:
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.

FIGURE 2.1

EXISTING CONDITIONS, LANE CONFIGURATIONS, TRAFFIC VOLUMES AND LOS

3. BASE YEAR 2022 TRAFFIC CONDITIONS

The Year 2022 was selected to reflect the Project completion year. The Base Year 2022 scenario represents the traffic conditions within the study area without the Project.

3.1 De Facto Growth Rate

Background traffic growth in the study area was determined based on the Oahu Regional Transportation Plan 2040 (ORTP) Travel Demand Forecasting Model (TDFM). The TDFM uses data from 2012 as its baseline before assigning land uses and socioeconomic data to Traffic Analysis Zones (TAZs) to generate and assign traffic across the roadway network. Based on the TDFM, a background growth rate of 1% was applied along Kamehameha Highway to determine Base Year 2022 conditions without the Project.

3.2 Background Developments

In addition to redevelopment accounted for in the de facto growth rate, traffic projects from all known background projects in the vicinity of the Project at the time of this study were added to the existing roadway network to account for intersection turning movements. Trips to/from the following developments were added to the existing traffic data to reflect Base Year 2022 conditions:

- Kamehameha Schools Town Center Commercial Development - Kamehameha Schools proposes to construct an 85,000 square foot (SF) commercial development along with 50 rental apartments on either side of Kamehameha Highway between Paalaa Road and Achiu Lane. There is currently no advertised build-out year at the time of this report, but this project was included in the Base Year 2022 traffic projections to be conservative.
- Haleiwa Residential Village - Kamehameha Schools proposes to construct approximately 125 condominium/apartment units, 150 townhomes, and 75 single family homes to the west of Kamehameha Highway and the Town Center Commercial Development. There is currently no advertised build-out year at the time of this report, but this project was included in the Base Year 2022 traffic projections to be conservative.
- Backyard Haleiwa - This project proposes to construct approximately 156 two-bedroom apartment units, 30,000 SF of commercial use with retail restaurant, and a farmer's market. Full buildout is expected by 2025, but this project was included in the Base Year 2022 traffic projections to be conservative. The forecast new traffic volumes due to this project were obtained from the 2015 Haleiwa Backyard TIAR published by SSFM International.
- Papailoa Road and Kapaeloa Residential Developments - Kamehameha Schools proposes to construct up to 130 single-family residential homes along Kamehameha Highway to the north of Haleiwa Town along with the Haleiwa Residential Village development. There is currently no advertised build-out year at the time of this report, but this project was included in the Base Year 2022 traffic projections to be conservative.

While there is no known TIAR published for the Town Center Commercial Development, the Haleiwa Residential Village, and the Papailoa Road & Kapaeloa Residential developments

proposed by Kamehameha Schools, a trip generation and distribution forecast was performed with similar assumptions provided in the Backyard Haleiwa TIAR published by SSFM.

3.3 Planned Roadway Improvements

HDOT is planning to realign Kamehameha Highway (Route 83) between Haleiwa and Waimea Bay. However, the 2019-2022 Statewide Transportation Improvement Program only includes funds for the final design phase. Thus, this report assumes the realignment will not be completed by Year 2022.

3.4 Base Year 2022 Analysis

It is anticipated that by Base Year 2022, traffic will have increased over existing conditions due to the development in the study area. Actual growth within the study region may vary based upon the actual construction of the various nearby developments.

Under Base Year 2022 conditions, all movements at the Study Intersections are expected to continue operating similar to existing conditions with an expected increase in vehicle delay of one (1) second or less, except for the following movements:

[1] Kamehameha Highway/Kawailoa Drive

- The westbound shared left-turn/right-turn lane is expected to operate at LOS E and within capacity conditions during the PM and WE peak hours of traffic.

Table 3.1 shows a summary of the Base Year 2022 delay, v/c ratio, and LOS. Figure 3.2 shows the Base Year 2022 traffic volumes and lane configuration at the study intersections. LOS worksheets are provided in Appendix C.

Table 3.1: Existing and Base Year 2022 LOS Summary

Intersection	Existing 2020						Base Year 2022					
	PM			WE			PM			WE		
	Delay	v/c Ratio	LOS	Delay	v/c Ratio	LOS	Delay	v/c Ratio	LOS	Delay	v/c Ratio	LOS
1. Kamehameha Highway/Kawailoa Drive												
WB LT/RT	28.9	0.17	D	32.1	0.20	D	41.3	0.24	E	46.8	0.28	E
SB LT	9.3	0.02	A	9.5	0.02	A	9.8	0.02	A	10.0	0.02	B
2. Kawailoa Drive/Kawailoa Transfer Station Driveway												
EB LT/TH	7.3	0.02	A	7.3	0.18	A	7.3	0.02	A	7.3	0.02	A
SB TH/LT	8.4	0.03	A	8.5	0.03	A	8.4	0.03	A	8.5	0.03	A

KAWAILOA TRANSFER STATION IMPROVEMENTS TA

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Engineers & Surveyors

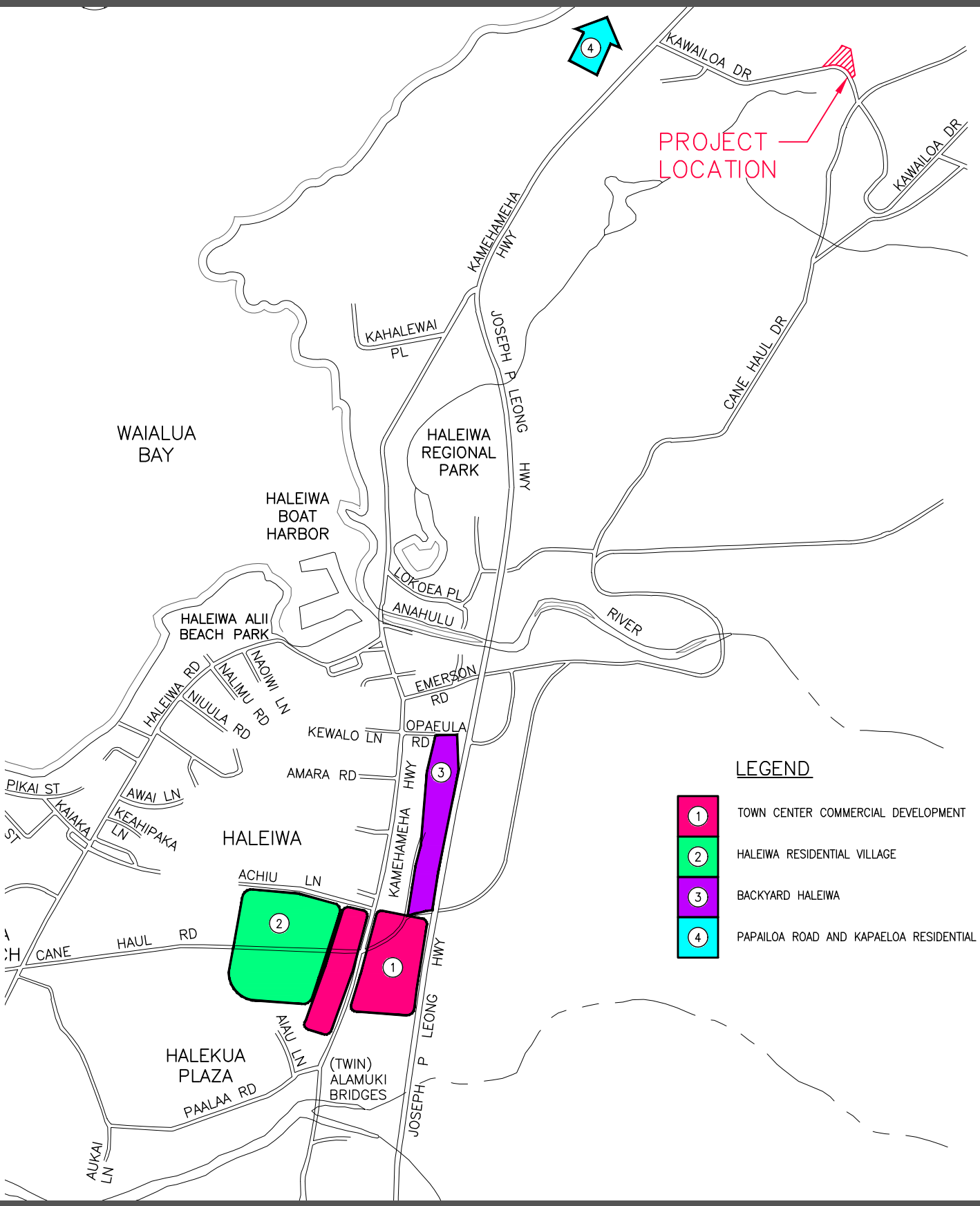

FIGURE 3.1

BACKGROUND PROJECTS

KAWAILOA TRANSFER STATION IMPROVEMENTS TA

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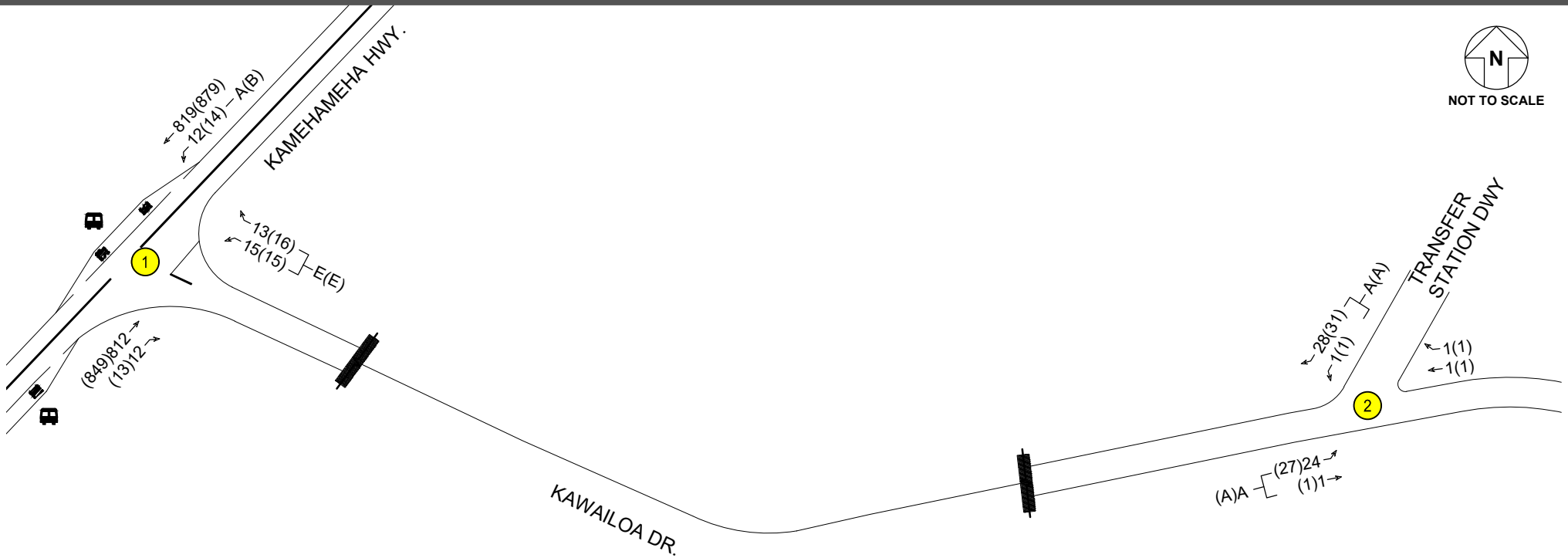
Engineers & Surveyors



LEGEND

##(##)	-	PM(WE) VEHICLE VOLUMES
X	-	UNSIGNALIZED INTERSECTION X
X(X)	-	PM(WE) LOS
🚌	-	EXISTING BUS STOP

NOTE:
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY.
DO NOT USE FOR CONSTRUCTION.

FIGURE 3.2

BASE YEAR 2022 CONDITIONS, LANE CONFIGURATIONS, TRAFFIC VOLUMES AND LOS

4. FUTURE YEAR 2022 TRAFFIC CONDITIONS

The Future Year 2022 scenario represents the traffic conditions within the Project study area with the full build-out of the Project.

4.1 Project Description

The Project site is located mauka of Kamehameha Highway in Haleiwa and is currently an active transfer station operating daily between 7:00 AM and 6:00 PM. The Project involves expanding the Kawailoa Transfer Station to handle the collection and storage of green waste, which is anticipated to include building a second load-out, permanent office, and restroom (including a holding tank). Access to the Project site will continue to be provided via the existing driveway along Kawailoa Drive. The Project is anticipated to be completed by year 2022.

4.2 Trip Generation

C&C ENV estimates that the proposed Project would generate an increase of two (2) residential trips per hour per day and an increase of two (2) transfer trailer trips per day. To be conservative, it is assumed that both transfer trailer trips would occur during the PM and WE peak hours.

As shown in Table 4.1, the Project is projected to generate 8(8) new trips during the PM(WE) peak hours of traffic.

Table 4.1 Project Trip Generation

Land Use	PM Peak Hour			WE Peak Hour		
	Enter (vph)	Exit (vph)	Total (vph)	Enter (vph)	Exit (vph)	Total (vph)
Residential Trips	2	2	4	2	2	4
Transfer Trailer Trips	2	2	4	2	2	4
Total	**4**	**4**	**8**	**4**	**4**	**8**

4.3 Trip Distribution & Assignment

Trips generated by the proposed Project were assigned throughout the study area generally based upon the average 2014 to 2019 HDOT traffic volume distribution and the proposed site plan. Assignments were generally based on the following approximate distributions:

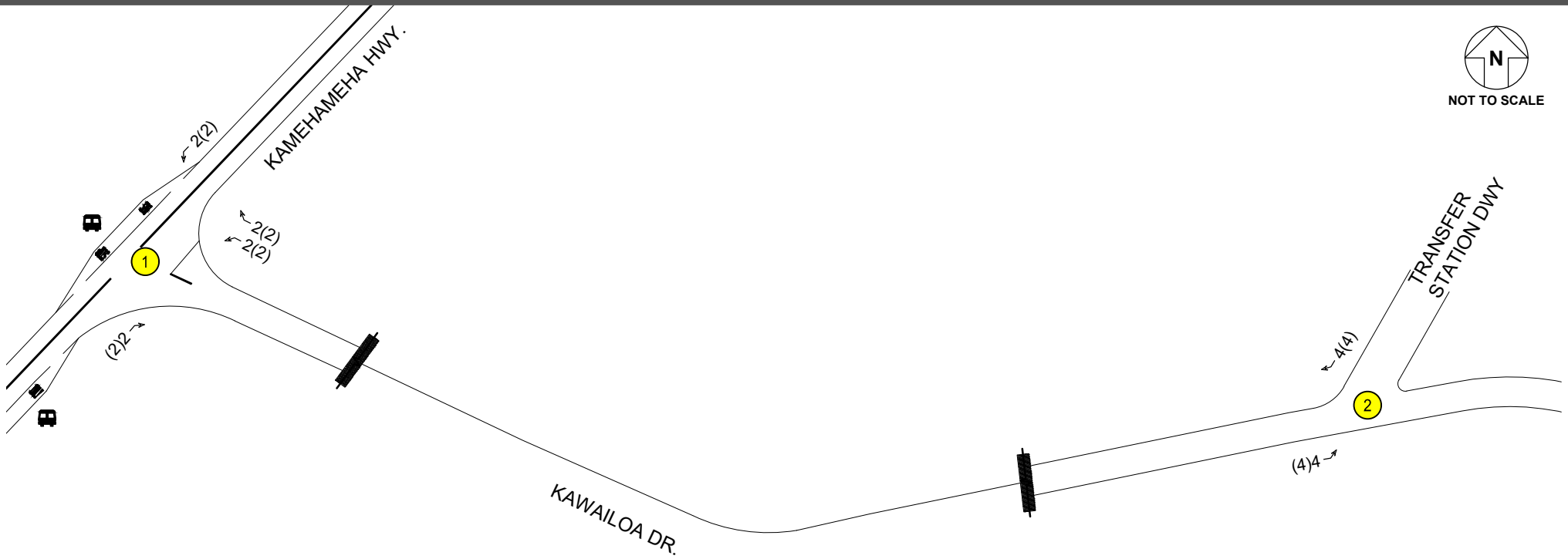
PM(WE) Peak Hour

- 48(51) percent to/from the north towards Kahuku
- 52(49) percent to/from the south towards Haleiwa

Figure 4.1 illustrates the Project-generated trip distribution.

KAWAILOA TRANSFER STATION IMPROVEMENTS TA

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors



LEGEND

##(##)	-	PM(WE) VEHICLE VOLUMES
X	-	UNSIGNALIZED INTERSECTION X
	-	EXISTING BUS STOP

NOTE:
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY.
DO NOT USE FOR CONSTRUCTION.

FIGURE 4.1

PROJECT TRIPS

4.4 Future Year 2022 Analysis

Under Future Year 2022 conditions, all movements at the Study Intersections are expected to continue operating similar to Base Year 2022 conditions during both the PM and WE peak hours with an expected increase in vehicle delay of four (4) seconds or less.

Due to the low increase in traffic due to the Project, no roadway improvements are recommended.

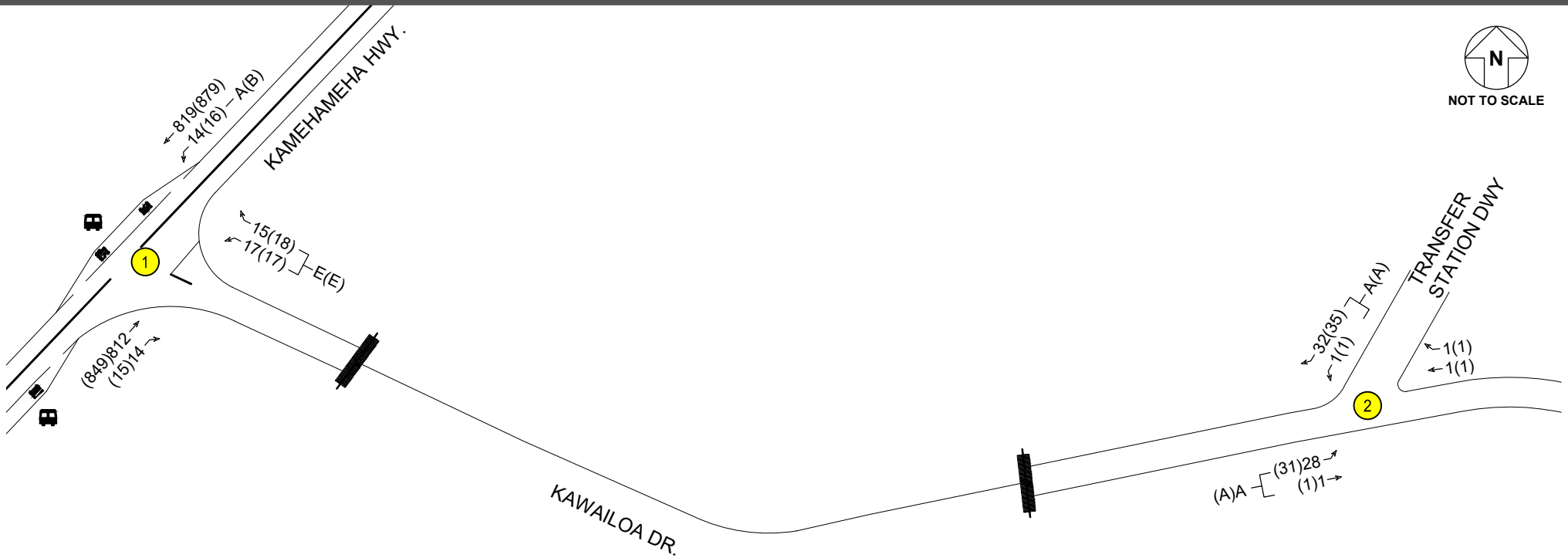
Table 4.2 shows a summary of the Future Year 2022 delay, v/c ratio, and LOS. Figure 4.2 shows the Future Year 2022 traffic volumes and lane configuration at the study intersections. LOS worksheets are provided in Appendix C.

Table 4.2: Base Year and Future Year 2022 LOS Summary

Intersection	Base Year 2022						Future Year 2022					
	PM			WE			PM			WE		
	Delay	v/c Ratio	LOS	Delay	v/c Ratio	LOS	Delay	v/c Ratio	LOS	Delay	v/c Ratio	LOS
1. Kamehameha Highway/Kawailoa Drive												
WB LT/RT	41.3	0.24	E	46.8	0.28	E	42.9	0.27	E	49.9	0.33	E
SB LT	9.8	0.02	A	10.0	0.02	B	9.9	0.02	A	10.1	0.02	B
2. Kawailoa Drive/Kawailoa Transfer Station Driveway												
EB LT/TH	7.3	0.02	A	7.3	0.02	A	7.3	0.02	A	7.3	0.02	A
SB TH/LT	8.4	0.03	A	8.5	0.03	A	8.5	0.03	A	8.5	0.04	A

KAWAILOA TRANSFER STATION IMPROVEMENTS TA

AustinTsutsumi & ASSOCIATES, INC.
Engineers & Surveyors



LEGEND

##(##)	-	PM(WE) VEHICLE VOLUMES
X	-	UNSIGNALIZED INTERSECTION X
X(X)	-	PM(WE) LOS
	-	EXISTING BUS STOP

NOTE:
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY.
DO NOT USE FOR CONSTRUCTION.

FIGURE 4.2

FUTURE YEAR 2022 CONDITIONS, LANE CONFIGURATIONS, TRAFFIC VOLUMES AND LOS

5. CONCLUSION

The Project site is located mauka of Kamehameha Highway in Haleiwa and is currently an active transfer station operating daily between 7:00 AM and 6:00 PM. The Project involves expanding the Kawailoa Transfer Station to handle the collection and storage of green waste, which is anticipated to include building a second load-out, permanent office, and restroom (including a holding tank). Access to the Project site will continue to be provided via the existing driveway along Kawailoa Drive. The Project is anticipated to be completed by year 2022.

5.1 Existing Conditions

Due to the prolonged disruptions to both residential and visitor traffic in the Haleiwa region as a result of the impacts of COVID-19, instead of collecting new traffic count data, most recently available traffic volume data from the Hawaii Department of Transportation (HDOT) and existing land uses were used to estimate the existing 2020 traffic volumes at the study intersections. Observations of existing conditions in the study area were also not conducted as part of this study as a result of the atypical traffic conditions.

All movements at the Study Intersections currently operated at LOS D or better during the PM and WE peak hours of traffic.

5.2 Base Year 2022 Conditions

Under Base Year 2022 conditions, all movements at the Study Intersections are expected to continue operating similar to existing conditions with the exception of the westbound shared left-turn/right-turn lane at the Kamehameha Highway/Kawailoa Drive intersection, which is expected to operate at LOS E and under capacity during the PM and WE peak hours of traffic.

5.3 Future Year 2022 Conditions

The Project is projected to generate 8(8) new trips during the PM(WE) peak hours of traffic.

Under Future Year 2022 conditions, all movements at the Study Intersections are expected to continue operating similar to Base Year 2022 conditions during both the PM and WE peak hours with an expected increase in vehicle delay of four (4) seconds or less.

Due to the low increase in traffic due to the Project, no roadway improvements are recommended.

6. REFERENCES

1. Transportation Research Board, Highway Capacity Manual, 6th Edition.

2. Institute of Transportation Engineers, Trip Generation, 10th Edition, 2017.

3. SSFM International, Backyard Haleiwa Traffic Impact Analysis Report, May 21, 2015.

APPENDICES

APPENDIX A

LEVEL OF SERVICE CRITERIA

LEVEL OF SERVICE (LOS) CRITERIA

VEHICULAR LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS (HCM 6th Edition)

Level of service for vehicles at signalized intersections is directly related to delay values and is assigned on that basis. Level of Service is a measure of the acceptability of delay values to motorists at a given intersection. The criteria are given in the table below.

Level-of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec./veh.)
A	< 10.0
B	>10.0 and ≤ 20.0
C	>20.0 and ≤ 35.0
D	>35.0 and ≤ 55.0
E	>55.0 and ≤ 80.0
F	> 80.0

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

VEHICULAR LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 6th Edition)

The level of service criteria for vehicles at unsignalized intersections is defined as the average control delay, in seconds per vehicle.

LOS delay threshold values are lower for two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections than those of signalized intersections. This is because more vehicles pass through signalized intersections, and therefore, drivers expect and tolerate greater delays. While the criteria for level of service for TWSC and AWSC intersections are the same, procedures to calculate the average total delay may differ.

Level of Service Criteria for Two-Way Stop-Controlled Intersections

Level of Service	Average Control Delay (sec/veh)
A	≤ 10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	> 50

LEVEL OF SERVICE (LOS) CRITERIA

VEHICULAR LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS (HCM 2000)

Level of service for vehicles at signalized intersections is directly related to delay values and is assigned on that basis. Level of Service is a measure of the acceptability of delay values to motorists at a given intersection. The criteria are given in the table below.

Level-of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec./veh.)
A	≤ 10.0
B	>10.0 and ≤ 20.0
C	>20.0 and ≤ 35.0
D	>35.0 and ≤ 55.0
E	>55.0 and ≤ 80.0
F	> 80.0

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

VEHICULAR LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 2000)

The level of service criteria for vehicles at unsignalized intersections is defined as the average control delay, in seconds per vehicle.

LOS delay threshold values are lower for two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections than those of signalized intersections. This is because more vehicles pass through signalized intersections, and therefore, drivers expect and tolerate greater delays. While the criteria for level of service for TWSC and AWSC intersections are the same, procedures to calculate the average total delay may differ.

Level of Service Criteria for Two-Way Stop-Controlled Intersections

Level of Service	Average Control Delay (sec/veh)
A	≤ 10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	> 50

APPENDIX B

TRAFFIC COUNT DATA

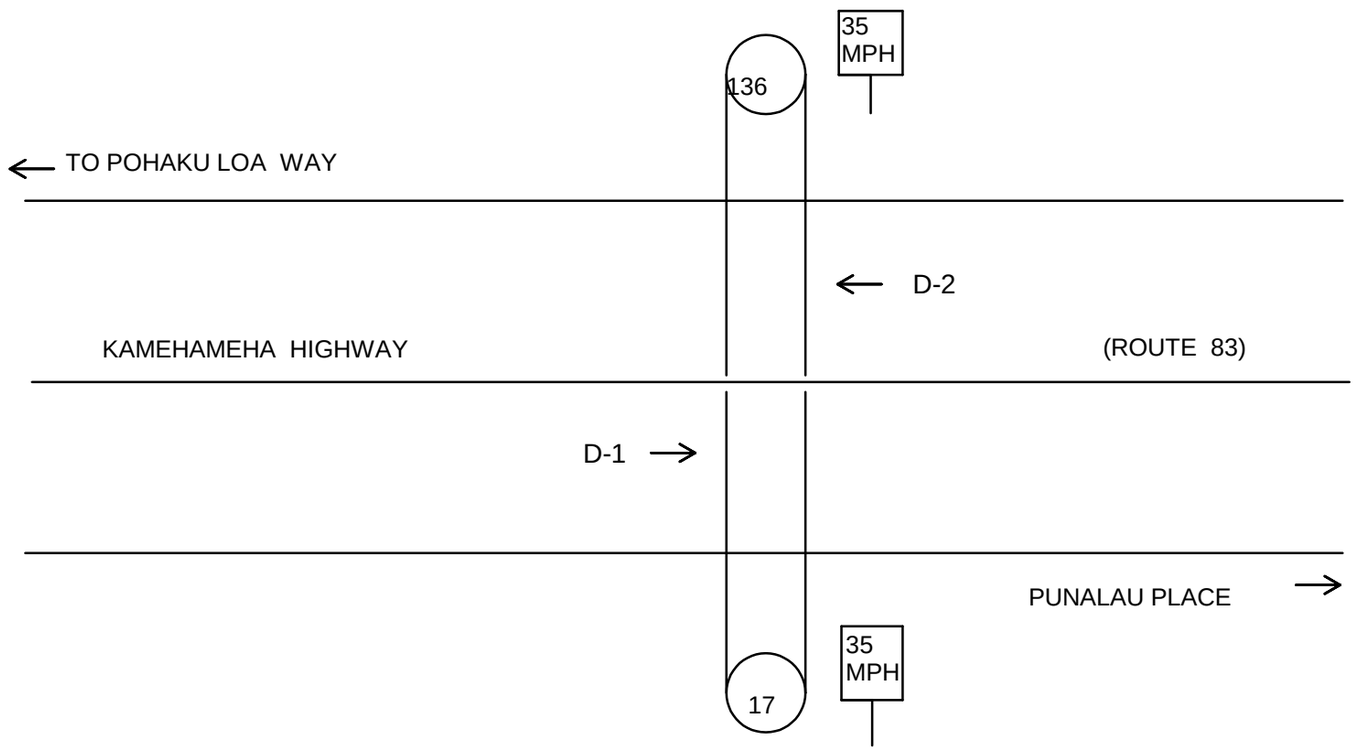
APPENDIX B

TRAFFIC COUNT DATA

Kamehameha Highway between Pohakuloa Way and Punalau Place

N
ISLAND: OAHU
AREA: HALEIWA

CHUN'S REEF



Station No:	B72 0083 00358

Station Location:			
Kamehameha Highway between Pohaku Loa Way (N Jct.) & Punalau Pl.			
Station Mileage:	3.95	GPS Coord (Latitude):	21.623966 N
		GPS Coord (Longitude):	158.078257 W
Begin Survey (Date/Time):	4-28-14 0000	End Survey (Date/Time):	5-1-14 0000
Survey Method: LOOP **HOSE** OTHER		Survey Type: VOL **CLASS** SPEED OTHER	
Survey Crew:	FIELD CREW	Module No.:	

HPMS DATA							
Segment Description:							
JP LEONG HIGHWAY: KAMEHAMEHA HIGHWAY TO PUPUKEA ROAD.							
Segment Begin LRS	1.86	Segment End LRS		6.33		Length	4.47
Facility Name	Juris	Func Class	Area Type	Route No.	Route Mile	D-1 = Direction to End of Route D-2 = Direction to Beginning of Route	
KAMEHAMEHA HIGHWAY	S	2	1	83	3.95	D-1	TO KALANIANAOLE HWY AND PALI HIGHWAY
						D-2	TO KAM HWY/KAUKONAHUA RD & J. P. LEONG HWY JCT.

Sketch By:	RG	Date:	1/10/2012	SLD:	2009

Run Date: 2015/04/24

Hawaii Department of Transportation
Highways Division — Highways Planning Survey Section
2014 Program Count - Summary

Site ID: B72008300358 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 16000
Functional Class: RURAL:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83
Location: Kamehameha Hwy btwn Pohaku Loa Way (N. Jct) _Punalau Place

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 04/29/2014															
12:00-12:15	9	5	14	06:00-06:15	45	52	97	12:00-12:15	130	100	230	06:00-06:15	103	111	214
12:15-12:30	7	8	15	06:15-06:30	60	79	139	12:15-12:30	163	119	282	06:15-06:30	119	90	209
12:30-12:45	12	5	17	06:30-06:45	62	103	165	12:30-12:45	148	132	280	06:30-06:45	106	67	173
12:45-01:00	8	4	12	06:45-07:00	53	82	135	12:45-01:00	139	121	260	06:45-07:00	99	78	177
01:00-01:15	4	2	6	07:00-07:15	77	93	170	01:00-01:15	159	135	294	07:00-07:15	92	65	157
01:15-01:30	2	1	3	07:15-07:30	81	123	204	01:15-01:30	162	123	285	07:15-07:30	85	95	180
01:30-01:45	6	5	11	07:30-07:45	77	128	205	01:30-01:45	118	133	251	07:30-07:45	78	67	145
01:45-02:00	9	4	13	07:45-08:00	86	131	217	01:45-02:00	142	119	261	07:45-08:00	69	38	107
02:00-02:15	2	3	5	08:00-08:15	95	136	231	02:00-02:15	144	163	307	08:00-08:15	66	35	101
02:15-02:30	0	1	1	08:15-08:30	75	121	196	02:15-02:30	152	168	320	08:15-08:30	45	38	83
02:30-02:45	3	1	4	08:30-08:45	92	111	203	02:30-02:45	136	162	298	08:30-08:45	69	36	105
02:45-03:00	0	5	5	08:45-09:00	94	109	203	02:45-03:00	154	152	306	08:45-09:00	53	39	92
03:00-03:15	4	2	6	09:00-09:15	91	118	209	03:00-03:15	166	155	321	09:00-09:15	50	25	75
03:15-03:30	5	6	11	09:15-09:30	100	113	213	03:15-03:30	124	181	305	09:15-09:30	47	24	71
03:30-03:45	3	7	10	09:30-09:45	101	108	209	03:30-03:45	184	136	320	09:30-09:45	51	35	86
03:45-04:00	5	5	10	09:45-10:00	113	126	239	03:45-04:00	160	162	322	09:45-10:00	42	27	69
04:00-04:15	4	14	18	10:00-10:15	129	111	240	04:00-04:15	160	151	311	10:00-10:15	33	15	48
04:15-04:30	9	20	29	10:15-10:30	112	106	218	04:15-04:30	165	154	319	10:15-10:30	40	15	55
04:30-04:45	14	23	37	10:30-10:45	107	117	224	04:30-04:45	141	128	269	10:30-10:45	27	15	42
04:45-05:00	9	29	38	10:45-11:00	144	121	265	04:45-05:00	131	128	259	10:45-11:00	29	13	42
05:00-05:15	18	55	73	11:00-11:15	150	127	277	05:00-05:15	117	127	244	11:00-11:15	36	11	47
05:15-05:30	26	53	79	11:15-11:30	152	128	280	05:15-05:30	115	115	230	11:15-11:30	32	10	42
05:30-05:45	22	69	91	11:30-11:45	133	106	239	05:30-05:45	156	119	275	11:30-11:45	21	9	30
05:45-06:00	36	71	107	11:45-12:00	173	127	300	05:45-06:00	124	104	228	11:45-12:00	11	4	15

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:15 AM to 08:15 AM		
AM - PEAK HR VOLUME	339	518	857
AM - K FACTOR (%)			5.78
AM - D (%)	39.56	60.44	100.00
DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM	07:15 AM to 08:15 AM	
AM - PEAK HR VOLUME	356	518	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:30 PM to 04:30 PM		
PM - PEAK HR VOLUME	669	603	1272
PM - K FACTOR (%)			8.57
PM - D (%)	52.59	47.41	100.00
DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:30 PM to 04:30 PM	03:00 PM to 04:00 PM	
PM - PEAK HR VOLUME	669	634	

AM PERIOD (00:00-12:00)			
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM		
AM - PEAK HR VOLUME	608	488	1096
AM - K FACTOR (%)			7.39
AM - D (%)	55.47	44.53	100.00

PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:30 PM to 04:30 PM		
PM - PEAK HR VOLUME	669	603	1272
PM - K FACTOR (%)			8.57
PM - D (%)	52.59	47.41	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	02:00 PM to 03:00 PM		
PEAK HR VOLUME	586	645	1231
DIRECTIONAL PEAK			
PEAK HR TIME	11:45 AM to 12:45 PM	02:00 PM to 03:00 PM	
PEAK HR VOLUME	614	645	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	2,402	2,676	5,078
AM 12-HR PERIOD (00:00-12:00)	2,619	3,074	5,693
PM 6-HR PERIOD (12:00-18:00)	3,490	3,287	6,777
PM 12-HR PERIOD (12:00-24:00)	4,893	4,249	9,142
24 HOUR PERIOD	7,512	7,323	14,835
D (%)	50.64	49.36	100.00

Run Date: 2015/04/24

Hawaii Department of Transportation
Highways Division — Highways Planning Survey Section
2014 Program Count - Summary

Site ID: B72008300358 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 16000
Functional Class: RURAL:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83
Location: Kamehameha Hwy btwn Pohaku Loa Way (N. Jct) _Punalau Place

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 04/30/2014															
12:00-12:15	9	10	19	06:00-06:15	41	58	99	12:00-12:15	136	100	236	06:00-06:15	118	97	215
12:15-12:30	11	7	18	06:15-06:30	67	74	141	12:15-12:30	141	102	243	06:15-06:30	96	111	207
12:30-12:45	13	2	15	06:30-06:45	55	86	141	12:30-12:45	80	107	187	06:30-06:45	100	96	196
12:45-01:00	10	6	16	06:45-07:00	55	93	148	12:45-01:00	85	140	225	06:45-07:00	106	90	196
01:00-01:15	11	0	11	07:00-07:15	73	115	188	01:00-01:15	146	166	312	07:00-07:15	91	92	183
01:15-01:30	4	4	8	07:15-07:30	87	115	202	01:15-01:30	203	153	356	07:15-07:30	92	74	166
01:30-01:45	4	2	6	07:30-07:45	75	139	214	01:30-01:45	164	130	294	07:30-07:45	102	74	176
01:45-02:00	4	1	5	07:45-08:00	82	137	219	01:45-02:00	142	156	298	07:45-08:00	80	52	132
02:00-02:15	5	4	9	08:00-08:15	65	102	167	02:00-02:15	136	128	264	08:00-08:15	84	38	122
02:15-02:30	3	2	5	08:15-08:30	94	101	195	02:15-02:30	156	147	303	08:15-08:30	59	33	92
02:30-02:45	4	3	7	08:30-08:45	77	118	195	02:30-02:45	163	127	290	08:30-08:45	57	29	86
02:45-03:00	1	4	5	08:45-09:00	72	109	181	02:45-03:00	162	136	298	08:45-09:00	57	28	85
03:00-03:15	4	3	7	09:00-09:15	79	111	190	03:00-03:15	134	125	259	09:00-09:15	55	37	92
03:15-03:30	3	3	6	09:15-09:30	79	112	191	03:15-03:30	153	164	317	09:15-09:30	55	19	74
03:30-03:45	5	6	11	09:30-09:45	83	104	187	03:30-03:45	162	152	314	09:30-09:45	55	60	115
03:45-04:00	6	9	15	09:45-10:00	86	118	204	03:45-04:00	164	144	308	09:45-10:00	50	32	82
04:00-04:15	6	9	15	10:00-10:15	114	90	204	04:00-04:15	181	157	338	10:00-10:15	36	28	64
04:15-04:30	10	15	25	10:15-10:30	103	109	212	04:15-04:30	149	167	316	10:15-10:30	34	13	47
04:30-04:45	9	28	37	10:30-10:45	102	109	211	04:30-04:45	160	159	319	10:30-10:45	38	11	49
04:45-05:00	7	28	35	10:45-11:00	119	102	221	04:45-05:00	128	133	261	10:45-11:00	33	13	46
05:00-05:15	17	37	54	11:00-11:15	111	122	233	05:00-05:15	149	121	270	11:00-11:15	22	8	30
05:15-05:30	25	43	68	11:15-11:30	116	113	229	05:15-05:30	152	104	256	11:15-11:30	14	11	25
05:30-05:45	25	51	76	11:30-11:45	126	106	232	05:30-05:45	151	137	288	11:30-11:45	19	10	29
05:45-06:00	29	68	97	11:45-12:00	131	114	245	05:45-06:00	126	140	266	11:45-12:00	10	19	29

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:00 AM to 08:00 AM		
AM - PEAK HR VOLUME	317	506	823
AM - K FACTOR (%)			5.65
AM - D (%)	38.52	61.48	100.00
DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:45 AM to 08:45 AM	07:00 AM to 08:00 AM	
AM - PEAK HR VOLUME	318	506	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:45 PM to 04:45 PM		
PM - PEAK HR VOLUME	654	627	1281
PM - K FACTOR (%)			8.79
PM - D (%)	51.05	48.95	100.00
DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:15 PM to 04:15 PM	03:45 PM to 04:45 PM	
PM - PEAK HR VOLUME	660	627	

AM PERIOD (00:00-12:00)			
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM		
AM - PEAK HR VOLUME	484	455	939
AM - K FACTOR (%)			6.44
AM - D (%)	51.54	48.46	100.00

PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:45 PM to 04:45 PM		
PM - PEAK HR VOLUME	654	627	1281
PM - K FACTOR (%)			8.79
PM - D (%)	51.05	48.95	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	01:00 PM to 02:00 PM		
PEAK HR VOLUME	655	605	1260
DIRECTIONAL PEAK			
PEAK HR TIME	01:00 PM to 02:00 PM	01:00 PM to 02:00 PM	
PEAK HR VOLUME	655	605	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	2,092	2,557	4,649
AM 12-HR PERIOD (00:00-12:00)	2,317	2,902	5,219
PM 6-HR PERIOD (12:00-18:00)	3,523	3,295	6,818
PM 12-HR PERIOD (12:00-24:00)	4,986	4,370	9,356
24 HOUR PERIOD	7,303	7,272	14,575
D (%)	50.11	49.89	100.00

Run Date: 2015/04/24

Hawaii Department of Transportation
Highways Division
Highways Planning Survey Section

Vehicle Classification Data Summary
2014

Site ID:	**B72008300358**	**Route No:**	**83**	**Date From:**	2014/04/29 0:00
Town:	**Oahu**	**Direction:**	+MP	**Date To:**	2014/04/30 23:45

Location: **Kamehameha Hwy btwn Pohaku Loa Way (N. Jct) _Punalau Place**

Functional Classification: **2 RURAL:PRINCIPAL ARTERIAL - OTHER**

REPORT TOTALS - 48 HOURS RECORDED

	VOLUME	%	NUMBER OF AXLES
Cycles	300	1.02%	600
PC	24715	84.04%	49429
2A-4T	3645	12.39%	7291
LIGHT VEHICLE TOTALS	28660	97.45%	57320
	HEAVY VEHICLES		
Bus	139	0.47%	348
SINGLE UNIT TRUCK			
2A-6T	300	1.02%	600
3A-SU	137	0.47%	411
4A-SU	4	0.01%	16
SINGLE-TRAILER TRUCKS			
4A-ST	79	0.27%	316
5A-ST	63	0.21%	315
6A-ST	6	0.02%	36
MULTI-TRAILER TRUCKS			
5A-MT	0	0.00%	0
6A-MT	0	0.00%	0
7A-MT	20	0.07%	140
HEAVY VEHICLE TOTALS	750	2.55%	2182
CLASSIFIED VEHICLES TOTALS	29410 (A)	100.00%	59502 (B)
UNCLASSIFIED VEHICLES TOTALS	0	0.00%	

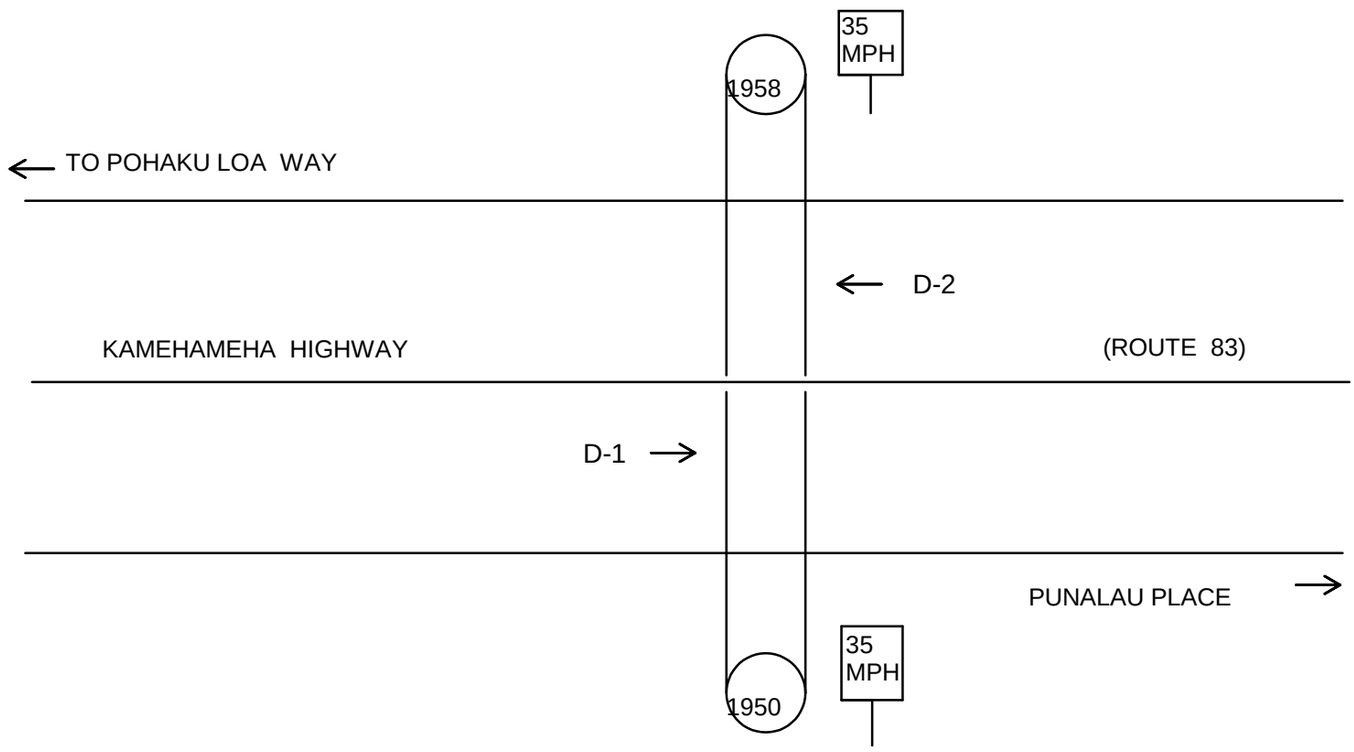
AXLE CORRECTION FACTOR (A/C) = 0.989

ROADTUBE EQUIVALENT(B/2) = 29751 (C)

PEAK HOUR VOLUME : 1268 2014/04/29 15:00	**PEAK HOUR TRUCK VOLUME**	**% TOTAL PEAK HOUR VOLUME**	**24 HOUR TRUCK VOLUME**	**AADT**	**% OF AADT**	**HPMS K-FACTOR (PEAK/AADT) (ITEM 66)**
SINGLE UNIT TRUCKS (TYPE 4-7)	**10**	**(65A-1) 0.81%**	**285**	**16000**	**(65A-2) 1.78%**	**7.93%**
COMBINATION (TYPE 8-13)	**8**	**(65B-1) 0.65%**	**82**		**(65B-2) 0.51%**	**7.93%**

N
ISLAND: OAHU
AREA: HALEIWA

CHUN'S REEF



Station No:	B72 0083 00358

Station Location:			
Kamehameha Highway between Pohaku Loa Way (N Jct.) & Punalau Pl.			
Station Mileage:	3.95	GPS Coord (Latitude):	21.623966 N
		GPS Coord (Longitude):	158.078257 W
Begin Survey (Date/Time):	9-14-15 0000	End Survey (Date/Time):	9-17-15 0000
Survey Method: LOOP **HOSE** OTHER		Survey Type: VOL **CLASS** SPEED OTHER	
Survey Crew:	FIELD CREW	Module No.:	

HPMS DATA						
Segment Description:						
JP LEONG HIGHWAY: KAMEHAMEHA HIGHWAY TO PUPUKEA ROAD.						
Segment Begin LRS	1.86	Segment End LRS	6.33	Length	4.47	

Facility Name	Juris	Func Class	Area Type	Route No.	Route Mile	D-1 = Direction to End of Route D-2 = Direction to Beginning of Route	
KAMEHAMEHA HIGHWAY	S	2	1	83	3.95	D-1	TO KALANIANAOLE HWY AND PALI HIGHWAY
						D-2	TO KAM HWY/KAUKONAHUA RD & J. P. LEONG HWY JCT.

Sketch By:	RG	Date:	1/10/2012	SLD:	2009

Run Date: 2016/06/07

Hawaii Department of Transportation
Highways Division — Highways Planning Survey Section
2015 Program Count - Summary

Site ID: B72008300358 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 16900
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83
Location: Kamehameha Hwy btwn Pohaku Loa Way (N. Jct) _Punalau Place

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 09/15/2015															
12:00-12:15	8	6	14	06:00-06:15	46	53	99	12:00-12:15	139	100	239	06:00-06:15	104	111	215
12:15-12:30	8	9	17	06:15-06:30	60	79	139	12:15-12:30	164	121	285	06:15-06:30	119	90	209
12:30-12:45	13	5	18	06:30-06:45	65	107	172	12:30-12:45	148	132	280	06:30-06:45	106	67	173
12:45-01:00	8	4	12	06:45-07:00	53	82	135	12:45-01:00	139	125	264	06:45-07:00	99	80	179
01:00-01:15	5	3	8	07:00-07:15	77	96	173	01:00-01:15	159	135	294	07:00-07:15	92	65	157
01:15-01:30	2	1	3	07:15-07:30	81	123	204	01:15-01:30	162	123	285	07:15-07:30	87	95	182
01:30-01:45	6	6	12	07:30-07:45	73	128	201	01:30-01:45	138	133	271	07:30-07:45	80	68	148
01:45-02:00	9	4	13	07:45-08:00	86	133	219	01:45-02:00	142	122	264	07:45-08:00	69	38	107
02:00-02:15	3	4	7	08:00-08:15	95	136	231	02:00-02:15	144	163	307	08:00-08:15	66	37	103
02:15-02:30	0	1	1	08:15-08:30	77	123	200	02:15-02:30	155	169	324	08:15-08:30	47	38	85
02:30-02:45	3	2	5	08:30-08:45	92	111	203	02:30-02:45	136	162	298	08:30-08:45	69	36	105
02:45-03:00	1	5	6	08:45-09:00	94	109	203	02:45-03:00	154	152	306	08:45-09:00	53	39	92
03:00-03:15	4	2	6	09:00-09:15	91	119	210	03:00-03:15	171	156	327	09:00-09:15	50	28	78
03:15-03:30	5	6	11	09:15-09:30	100	113	213	03:15-03:30	124	181	305	09:15-09:30	47	24	71
03:30-03:45	4	7	11	09:30-09:45	103	108	211	03:30-03:45	184	136	320	09:30-09:45	54	35	89
03:45-04:00	5	5	10	09:45-10:00	111	126	237	03:45-04:00	160	164	324	09:45-10:00	42	27	69
04:00-04:15	4	14	18	10:00-10:15	129	113	242	04:00-04:15	160	151	311	10:00-10:15	35	13	48
04:15-04:30	9	20	29	10:15-10:30	116	106	222	04:15-04:30	157	154	311	10:15-10:30	40	15	55
04:30-04:45	14	22	36	10:30-10:45	109	118	227	04:30-04:45	141	131	272	10:30-10:45	29	16	45
04:45-05:00	9	29	38	10:45-11:00	145	123	268	04:45-05:00	129	128	257	10:45-11:00	29	13	42
05:00-05:15	18	55	73	11:00-11:15	150	127	277	05:00-05:15	117	127	244	11:00-11:15	36	12	48
05:15-05:30	26	54	80	11:15-11:30	156	128	284	05:15-05:30	118	116	234	11:15-11:30	32	10	42
05:30-05:45	22	69	91	11:30-11:45	138	106	244	05:30-05:45	156	119	275	11:30-11:45	22	9	31
05:45-06:00	36	71	107	11:45-12:00	176	129	305	05:45-06:00	124	106	230	11:45-12:00	12	5	17

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:15 AM to 08:15 AM		
AM - PEAK HR VOLUME	335	520	855
AM - K FACTOR (%)			5.71
AM - D (%)	39.18	60.82	100.00
DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM	07:15 AM to 08:15 AM	
AM - PEAK HR VOLUME	358	520	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 PM to 04:00 PM		
PM - PEAK HR VOLUME	639	637	1276
PM - K FACTOR (%)			8.53
PM - D (%)	50.08	49.92	100.00
DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:30 PM to 04:30 PM	03:00 PM to 04:00 PM	
PM - PEAK HR VOLUME	661	637	

AM PERIOD (00:00-12:00)			
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM		
AM - PEAK HR VOLUME	620	490	1110
AM - K FACTOR (%)			7.42
AM - D (%)	55.86	44.14	100.00

PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 PM to 04:00 PM		
PM - PEAK HR VOLUME	639	637	1276
PM - K FACTOR (%)			8.53
PM - D (%)	50.08	49.92	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	02:00 PM to 03:00 PM		
PEAK HR VOLUME	589	646	1235
DIRECTIONAL PEAK			
PEAK HR TIME	11:45 AM to 12:45 PM	02:00 PM to 03:00 PM	
PEAK HR VOLUME	627	646	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	2,423	2,696	5,119
AM 12-HR PERIOD (00:00-12:00)	2,645	3,100	5,745
PM 6-HR PERIOD (12:00-18:00)	3,521	3,306	6,827
PM 12-HR PERIOD (12:00-24:00)	4,940	4,277	9,217
24 HOUR PERIOD	7,585	7,377	14,962
D (%)	50.70	49.30	100.00

Run Date: 2016/06/07

Hawaii Department of Transportation
Highways Division — Highways Planning Survey Section
2015 Program Count - Summary

Site ID: B72008300358 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 16900
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83
Location: Kamehameha Hwy btwn Pohaku Loa Way (N. Jct) _Punalau Place

TIME-AM	DIR 1	DIR 2	TOTAL	TIME-AM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL	TIME-PM	DIR 1	DIR 2	TOTAL
DATE : 09/16/2015															
12:00-12:15	9	10	19	06:00-06:15	41	58	99	12:00-12:15	137	101	238	06:00-06:15	118	97	215
12:15-12:30	12	7	19	06:15-06:30	67	74	141	12:15-12:30	143	102	245	06:15-06:30	100	111	211
12:30-12:45	13	3	16	06:30-06:45	56	86	142	12:30-12:45	80	107	187	06:30-06:45	103	97	200
12:45-01:00	10	6	16	06:45-07:00	55	93	148	12:45-01:00	85	140	225	06:45-07:00	106	90	196
01:00-01:15	11	0	11	07:00-07:15	73	118	191	01:00-01:15	146	161	307	07:00-07:15	91	94	185
01:15-01:30	5	4	9	07:15-07:30	90	119	209	01:15-01:30	204	153	357	07:15-07:30	92	74	166
01:30-01:45	4	2	6	07:30-07:45	75	139	214	01:30-01:45	164	128	292	07:30-07:45	101	74	175
01:45-02:00	4	2	6	07:45-08:00	86	140	226	01:45-02:00	142	156	298	07:45-08:00	82	52	134
02:00-02:15	5	4	9	08:00-08:15	67	105	172	02:00-02:15	136	132	268	08:00-08:15	84	41	125
02:15-02:30	4	2	6	08:15-08:30	94	103	197	02:15-02:30	159	147	306	08:15-08:30	59	33	92
02:30-02:45	4	3	7	08:30-08:45	80	118	198	02:30-02:45	163	129	292	08:30-08:45	57	29	86
02:45-03:00	1	4	5	08:45-09:00	74	110	184	02:45-03:00	162	136	298	08:45-09:00	57	28	85
03:00-03:15	4	3	7	09:00-09:15	79	111	190	03:00-03:15	136	129	265	09:00-09:15	55	38	93
03:15-03:30	3	3	6	09:15-09:30	79	112	191	03:15-03:30	153	164	317	09:15-09:30	61	19	80
03:30-03:45	6	7	13	09:30-09:45	83	102	185	03:30-03:45	162	152	314	09:30-09:45	55	60	115
03:45-04:00	6	9	15	09:45-10:00	85	117	202	03:45-04:00	166	144	310	09:45-10:00	49	33	82
04:00-04:15	6	9	15	10:00-10:15	113	90	203	04:00-04:15	181	159	340	10:00-10:15	36	31	67
04:15-04:30	10	16	26	10:15-10:30	103	109	212	04:15-04:30	152	167	319	10:15-10:30	35	13	48
04:30-04:45	9	28	37	10:30-10:45	105	107	212	04:30-04:45	160	162	322	10:30-10:45	38	12	50
04:45-05:00	7	28	35	10:45-11:00	120	102	222	04:45-05:00	130	133	263	10:45-11:00	33	13	46
05:00-05:15	17	37	54	11:00-11:15	114	124	238	05:00-05:15	148	122	270	11:00-11:15	22	8	30
05:15-05:30	26	43	69	11:15-11:30	116	113	229	05:15-05:30	152	106	258	11:15-11:30	14	12	26
05:30-05:45	27	53	80	11:30-11:45	126	106	232	05:30-05:45	151	137	288	11:30-11:45	18	11	29
05:45-06:00	29	70	99	11:45-12:00	131	114	245	05:45-06:00	129	142	271	11:45-12:00	11	21	32

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:00 AM to 08:00 AM		
AM - PEAK HR VOLUME	324	516	840
AM - K FACTOR (%)			5.72
AM - D (%)	38.57	61.43	100.00
DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:45 AM to 08:45 AM	07:00 AM to 08:00 AM	
AM - PEAK HR VOLUME	327	516	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:45 PM to 04:45 PM		
PM - PEAK HR VOLUME	659	632	1291
PM - K FACTOR (%)			8.79
PM - D (%)	51.05	48.95	100.00
DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:15 PM to 04:15 PM	03:45 PM to 04:45 PM	
PM - PEAK HR VOLUME	662	632	

AM PERIOD (00:00-12:00)			
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM		
AM - PEAK HR VOLUME	487	457	944
AM - K FACTOR (%)			6.43
AM - D (%)	51.59	48.41	100.00

PM PERIOD (12:00-24:00)			
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:45 PM to 04:45 PM		
PM - PEAK HR VOLUME	659	632	1291
PM - K FACTOR (%)			8.79
PM - D (%)	51.05	48.95	100.00

NON-COMMUTER PERIOD (09:00-15:00)			
TWO DIRECTIONAL PEAK			
PEAK HR TIME	01:00 PM to 02:00 PM		
PEAK HR VOLUME	656	598	1254
DIRECTIONAL PEAK			
PEAK HR TIME	01:00 PM to 02:00 PM	01:00 PM to 02:00 PM	
PEAK HR VOLUME	656	598	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	Total
AM 6-HR PERIOD (06:00-12:00)	2,112	2,570	4,682
AM 12-HR PERIOD (00:00-12:00)	2,344	2,923	5,267
PM 6-HR PERIOD (12:00-18:00)	3,541	3,309	6,850
PM 12-HR PERIOD (12:00-24:00)	5,018	4,400	9,418
24 HOUR PERIOD	7,362	7,323	14,685
D (%)	50.13	49.87	100.00

Run Date: 2016/06/07

Hawaii Department of Transportation
Highways Division
Highways Planning Survey Section

Vehicle Classification Data Summary
2015

Site ID:	**B72008300358**	**Route No:**	**83**	**Date From:**	2015/09/15 0:00
Town:	**Oahu**	**Direction:**	+MP	**Date To:**	2015/09/16 23:45

Location: **Kamehameha Hwy btwn Pohaku Loa Way (N. Jct) _Punalau Place**

Functional Classification: **14 URBAN:PRINCIPAL ARTERIAL - OTHER**

REPORT TOTALS - 48 HOURS RECORDED

	VOLUME	%	NUMBER OF AXLES
Cycles	299	1.01%	599
PC	24952	84.16%	49905
2A-4T	3645	12.29%	7290
LIGHT VEHICLE TOTALS	28897	97.47%	57793
	HEAVY VEHICLES		
Bus	139	0.47%	348
SINGLE UNIT TRUCK			
2A-6T	300	1.01%	600
3A-SU	137	0.46%	411
4A-SU	4	0.01%	16
SINGLE-TRAILER TRUCKS			
4A-ST	79	0.27%	316
5A-ST	63	0.21%	315
6A-ST	6	0.02%	36
MULTI-TRAILER TRUCKS			
5A-MT	0	0.00%	0
6A-MT	0	0.00%	0
7A-MT	20	0.07%	140
HEAVY VEHICLE TOTALS	750	2.53%	2182
CLASSIFIED VEHICLES TOTALS	29646 (A)	100.00%	59976 (B)
UNCLASSIFIED VEHICLES TOTALS	1	0.00%	

AXLE CORRECTION FACTOR (A/C) = 0.989

ROADTUBE EQUIVALENT(B/2) = 29988 (C)

PEAK HOUR VOLUME : 1276 2015/09/15 15:00	**PEAK HOUR TRUCK VOLUME**	**% TOTAL PEAK HOUR VOLUME**	**24 HOUR TRUCK VOLUME**	**AADT**	**% OF AADT**	**HPMS K-FACTOR (PEAK/AADT) (ITEM 66)**
SINGLE UNIT TRUCKS (TYPE 4-7)	**10**	**(65A-1) 0.80%**	**285**	**16900**	**(65A-2) 1.69%**	**7.55%**
COMBINATION (TYPE 8-13)	**8**	**(65B-1) 0.64%**	**82**		**(65B-2) 0.49%**	**7.55%**

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

Run Date: 01-SEP-20

State of Hawaii, Department of Transportation, Highways Division
15 Minute Volume Report

Site ID: B72008300358 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 12700
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83
Location: **DATE: 01-AUG-17**

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:45 AM to 08:45 AM		
AM - PEAK HR VOLUME	367	353	720
AM - K FACTOR(%)			5.82
AM - D(%)	50.97	49.03	100
DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:45 AM to 08:45 AM	07:45 AM to 08:45 AM	
AM - PEAK HR VOLUME	367	353	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	5:45 PM to 6:45 PM		
PM - PEAK HR VOLUME	430	373	803
PM - K FACTOR(%)			6.49
PM -D(%)	53.55	46.45	100
DIRECTIONAL PEAK			
PM - PEAK HR TIME	4:00 PM to 5:00 PM	6:00 PM to 7:00 PM	
PM - PEAK HR VOLUME	631	402	

AM PERIOD (00:00-12:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	10:45 AM to 11:45 AM		
AM - PEAK HR VOLUME	521	521	939
AM - K FACTOR(%)			7.59
AM - D(%)	50.97	49.03	100

PM PERIOD (12:00-24:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	1:15 PM to 2:15 PM		
PM - PEAK HR VOLUME	544	631	956
PM - K FACTOR(%)			7.72
PM -D(%)	53.55	46.45	100

NON COMMUTER PERIOD (09:00-15:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PEAK HR TIME	1:15 PM to 2:15 PM		
PEAK HR VOLUME	544	412	956
DIRECTIONAL PEAK			
PEAK HR TIME	1:15 PM to 2:15 PM	0:45 PM to 1:45 PM	
PEAK HR VOLUME	544	442	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	TOTAL
AM 6-HR PERIOD (06:00-12:00)	2,190	2,022	4,212
AM 12-HR PERIOD (00:00-12:00)	2,388	2,261	4,649
PM 6-HR PERIOD (12:00-18:00)	3,261	1,782	5,043
PM 12-HR PERIOD (12:00-24:00)	4,681	3,047	7,728
24-HR PERIOD (12:00-24:00)	7,069	5,308	12,377
D%	57.11	42.89	100

TIME - AM	DIR1	DIR 2	TOTAL
12:00 - 12:15	13	4	17

TIME - AM	DIR1	DIR 2	TOTAL
06:00 - 06:15	46	37	83

TIME - PM	DIR1	DIR 2	TOTAL
12:00 - 12:15	141	89	230

TIME - PM	DIR1	DIR 2	TOTAL
06:00 - 06:15	95	116	211

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

12:15 - 12:30	9	8	17	06:15 - 06:30	44	38	82	12:15 - 12:30	133	101	234	06:15 - 06:30	122	91	213
12:30 - 12:45	10	9	19	06:30 - 06:45	48	55	103	12:30 - 12:45	128	101	229	06:30 - 06:45	103	95	198
12:45 - 01:00	6	5	11	06:45 - 07:00	60	57	117	12:45 - 01:00	122	101	223	06:45 - 07:00	77	100	177
01:00 - 01:15	6	3	9	07:00 - 07:15	55	57	112	01:00 - 01:15	121	119	240	07:00 - 07:15	73	49	122
01:15 - 01:30	2	3	5	07:15 - 07:30	65	71	136	01:15 - 01:30	138	115	253	07:15 - 07:30	70	81	151
01:30 - 01:45	4	0	4	07:30 - 07:45	68	87	155	01:30 - 01:45	119	107	226	07:30 - 07:45	74	143	217
01:45 - 02:00	4	4	8	07:45 - 08:00	90	112	202	01:45 - 02:00	131	94	225	07:45 - 08:00	70	93	163
02:00 - 02:15	2	6	8	08:00 - 08:15	99	69	168	02:00 - 02:15	156	96	252	08:00 - 08:15	82	83	165
02:15 - 02:30	4	2	6	08:15 - 08:30	80	68	148	02:15 - 02:30	130	89	219	08:15 - 08:30	80	58	138
02:30 - 02:45	5	5	10	08:30 - 08:45	98	104	202	02:30 - 02:45	123	113	236	08:30 - 08:45	62	33	95
02:45 - 03:00	1	2	3	08:45 - 09:00	87	71	158	02:45 - 03:00	130	117	247	08:45 - 09:00	66	39	105
03:00 - 03:15	4	1	5	09:00 - 09:15	122	84	206	03:00 - 03:15	127	107	234	09:00 - 09:15	47	35	82
03:15 - 03:30	4	3	7	09:15 - 09:30	91	81	172	03:15 - 03:30	132	55	187	09:15 - 09:30	40	41	81
03:30 - 03:45	1	6	7	09:30 - 09:45	91	125	216	03:30 - 03:45	123	49	172	09:30 - 09:45	53	28	81

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

03:45 - 04:00	6	4	10	09:45 - 10:00	81	94	175	03:45 - 04:00	149	19	168	09:45 - 10:00	51	34	85
04:00 - 04:15	5	4	9	10:00 - 10:15	104	103	207	04:00 - 04:15	167	46	213	10:00 - 10:15	57	40	97
04:15 - 04:30	11	3	14	10:15 - 10:30	106	107	213	04:15 - 04:30	151	23	174	10:15 - 10:30	29	24	53
04:30 - 04:45	8	19	27	10:30 - 10:45	113	91	204	04:30 - 04:45	156	27	183	10:30 - 10:45	35	21	56
04:45 - 05:00	10	21	31	10:45 - 11:00	136	107	243	04:45 - 05:00	157	35	192	10:45 - 11:00	37	16	53
05:00 - 05:15	16	25	41	11:00 - 11:15	126	103	229	05:00 - 05:15	138	38	176	11:00 - 11:15	30	10	40
05:15 - 05:30	17	33	50	11:15 - 11:30	119	117	236	05:15 - 05:30	138	29	167	11:15 - 11:30	23	12	35
05:30 - 05:45	19	32	51	11:30 - 11:45	140	91	231	05:30 - 05:45	141	41	182	11:30 - 11:45	25	12	37
05:45 - 06:00	31	37	68	11:45 - 12:00	121	93	214	05:45 - 06:00	110	71	181	11:45 - 12:00	19	11	30

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

release 44 Set Screen Reader Mode On

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

Run Date: 01-SEP-20

State of Hawaii, Department of Transportation, Highways Division
15 Minute Volume Report

Site ID: B72008300358 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 12700
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83
Location: **DATE:** **02-AUG-17**

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:30 AM to 08:30 AM		
AM - PEAK HR VOLUME	304	388	692
AM - K FACTOR(%)			5.51
AM - D(%)	43.93	56.07	100
DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM	07:15 AM to 08:15 AM	
AM - PEAK HR VOLUME	331	392	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	5:15 PM to 6:15 PM		
PM - PEAK HR VOLUME	486	381	867
PM - K FACTOR(%)			6.9
PM -D(%)	56.06	43.94	100
DIRECTIONAL PEAK			
PM - PEAK HR TIME	3:30 PM to 4:30 PM	5:15 PM to 6:15 PM	
PM - PEAK HR VOLUME	640	381	

AM PERIOD (00:00-12:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM		
AM - PEAK HR VOLUME	508	508	898
AM - K FACTOR(%)			7.15
AM - D(%)	43.93	56.07	100

PM PERIOD (12:00-24:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	1:15 PM to 2:15 PM		
PM - PEAK HR VOLUME	563	640	1,014
PM - K FACTOR(%)			8.07
PM -D(%)	56.06	43.94	100

NON COMMUTER PERIOD (09:00-15:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PEAK HR TIME	1:15 PM to 2:15 PM		
PEAK HR VOLUME	563	451	1,014
DIRECTIONAL PEAK			
PEAK HR TIME	1:00 PM to 2:00 PM	1:15 PM to 2:15 PM	
PEAK HR VOLUME	578	451	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	TOTAL
AM 6-HR PERIOD (06:00-12:00)	2,197	2,017	4,214
AM 12-HR PERIOD (00:00-12:00)	2,460	2,290	4,750
PM 6-HR PERIOD (12:00-18:00)	3,244	1,720	4,964
PM 12-HR PERIOD (12:00-24:00)	4,901	2,907	7,808
24-HR PERIOD (12:00-24:00)	7,361	5,197	12,558
D%	58.62	41.38	100

TIME - AM	DIR1	DIR 2	TOTAL
12:00 - 12:15	10	8	18

TIME - AM	DIR1	DIR 2	TOTAL
06:00 - 06:15	35	53	88

TIME - PM	DIR1	DIR 2	TOTAL
12:00 - 12:15	128	92	220

TIME - PM	DIR1	DIR 2	TOTAL
06:00 - 06:15	121	104	225

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

12:15 - 12:30	17	6	23	06:15 - 06:30	46	47	93	12:15 - 12:30	123	115	238	06:15 - 06:30	101	96	197
12:30 - 12:45	7	11	18	06:30 - 06:45	69	59	128	12:30 - 12:45	136	85	221	06:30 - 06:45	100	90	190
12:45 - 01:00	11	3	14	06:45 - 07:00	56	56	112	12:45 - 01:00	136	113	249	06:45 - 07:00	109	90	199
01:00 - 01:15	5	5	10	07:00 - 07:15	41	53	94	01:00 - 01:15	154	99	253	07:00 - 07:15	98	59	157
01:15 - 01:30	11	2	13	07:15 - 07:30	44	88	132	01:15 - 01:30	128	105	233	07:15 - 07:30	82	62	144
01:30 - 01:45	5	1	6	07:30 - 07:45	70	102	172	01:30 - 01:45	153	103	256	07:30 - 07:45	84	101	185
01:45 - 02:00	3	5	8	07:45 - 08:00	84	90	174	01:45 - 02:00	143	104	247	07:45 - 08:00	82	114	196
02:00 - 02:15	4	2	6	08:00 - 08:15	61	112	173	02:00 - 02:15	139	139	278	08:00 - 08:15	67	75	142
02:15 - 02:30	7	3	10	08:15 - 08:30	89	84	173	02:15 - 02:30	135	48	183	08:15 - 08:30	61	77	138
02:30 - 02:45	7	3	10	08:30 - 08:45	85	78	163	02:30 - 02:45	141	29	170	08:30 - 08:45	101	43	144
02:45 - 03:00	5	1	6	08:45 - 09:00	96	83	179	02:45 - 03:00	119	56	175	08:45 - 09:00	64	37	101
03:00 - 03:15	9	5	14	09:00 - 09:15	107	92	199	03:00 - 03:15	144	23	167	09:00 - 09:15	80	22	102
03:15 - 03:30	3	3	6	09:15 - 09:30	119	98	217	03:15 - 03:30	113	33	146	09:15 - 09:30	73	26	99
03:30 - 03:45	3	3	6	09:30 - 09:45	86	79	165	03:30 - 03:45	170	23	193	09:30 - 09:45	70	50	120

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

03:45 - 04:00	5	6	11	09:45 - 10:00	106	85	191	03:45 - 04:00	159	64	223	09:45 - 10:00	74	33	107
04:00 - 04:15	7	16	23	10:00 - 10:15	131	88	219	04:00 - 04:15	168	15	183	10:00 - 10:15	52	24	76
04:15 - 04:30	5	11	16	10:15 - 10:30	112	83	195	04:15 - 04:30	143	36	179	10:15 - 10:30	66	11	77
04:30 - 04:45	19	8	27	10:30 - 10:45	124	98	222	04:30 - 04:45	115	45	160	10:30 - 10:45	45	13	58
04:45 - 05:00	7	29	36	10:45 - 11:00	128	99	227	04:45 - 05:00	136	73	209	10:45 - 11:00	28	15	43
05:00 - 05:15	12	28	40	11:00 - 11:15	125	105	230	05:00 - 05:15	96	43	139	11:00 - 11:15	28	10	38
05:15 - 05:30	23	41	64	11:15 - 11:30	107	91	198	05:15 - 05:30	116	109	225	11:15 - 11:30	21	10	31
05:30 - 05:45	34	34	68	11:30 - 11:45	119	116	235	05:30 - 05:45	129	83	212	11:30 - 11:45	28	16	44
05:45 - 06:00	44	39	83	11:45 - 12:00	157	78	235	05:45 - 06:00	120	85	205	11:45 - 12:00	22	9	31

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

release 44 Set Screen Reader Mode On

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

Run Date: 01-SEP-20

State of Hawaii, Department of Transportation, Highways Division
15 Minute Volume Report

Site ID: B72008300358 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 14600
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83
Location: **DATE: 16-OCT-18**

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM		
AM - PEAK HR VOLUME	378	375	753
AM - K FACTOR(%)			5.68
AM - D(%)	50.2	49.8	100
DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM	07:15 AM to 08:15 AM	
AM - PEAK HR VOLUME	378	385	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	4:30 PM to 5:30 PM		
PM - PEAK HR VOLUME	514	530	1,044
PM - K FACTOR(%)			7.88
PM -D(%)	49.23	50.77	100
DIRECTIONAL PEAK			
PM - PEAK HR TIME	3:00 PM to 4:00 PM	4:45 PM to 5:45 PM	
PM - PEAK HR VOLUME	539	539	

AM PERIOD (00:00-12:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:00 AM to 12:00 PM		
AM - PEAK HR VOLUME	554	560	982
AM - K FACTOR(%)			7.41
AM - D(%)	50.2	49.8	100

PM PERIOD (12:00-24:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	1:15 PM to 2:15 PM		
PM - PEAK HR VOLUME	590	619	1,054
PM - K FACTOR(%)			7.95
PM -D(%)	49.23	50.77	100

NON COMMUTER PERIOD (09:00-15:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PEAK HR TIME	1:15 PM to 2:15 PM		
PEAK HR VOLUME	590	464	1,054
DIRECTIONAL PEAK			
PEAK HR TIME	12:00 PM to 1:00 PM	0:45 PM to 1:45 PM	
PEAK HR VOLUME	619	491	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	TOTAL
AM 6-HR PERIOD (06:00-12:00)	2,375	2,237	4,612
AM 12-HR PERIOD (00:00-12:00)	2,626	2,559	5,185
PM 6-HR PERIOD (12:00-18:00)	3,244	2,492	5,736
PM 12-HR PERIOD (12:00-24:00)	4,496	3,572	8,068
24-HR PERIOD (12:00-24:00)	7,122	6,131	13,253
D%	53.74	46.26	100

TIME - AM	DIR1	DIR 2	TOTAL
12:00 - 12:15	6	7	13

TIME - AM	DIR1	DIR 2	TOTAL
06:00 - 06:15	58	55	113

TIME - PM	DIR1	DIR 2	TOTAL
12:00 - 12:15	146	106	252

TIME - PM	DIR1	DIR 2	TOTAL
06:00 - 06:15	79	85	164

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

12:15 - 12:30	7	11	18	06:15 - 06:30	68	51	119	12:15 - 12:30	152	102	254	06:15 - 06:30	113	135	248
12:30 - 12:45	9	7	16	06:30 - 06:45	72	62	134	12:30 - 12:45	159	85	244	06:30 - 06:45	97	174	271
12:45 - 01:00	7	4	11	06:45 - 07:00	75	64	139	12:45 - 01:00	162	109	271	06:45 - 07:00	86	116	202
01:00 - 01:15	6	7	13	07:00 - 07:15	70	77	147	01:00 - 01:15	109	123	232	07:00 - 07:15	70	79	149
01:15 - 01:30	7	3	10	07:15 - 07:30	68	102	170	01:15 - 01:30	139	118	257	07:15 - 07:30	70	47	117
01:30 - 01:45	4	2	6	07:30 - 07:45	92	93	185	01:30 - 01:45	147	141	288	07:30 - 07:45	66	54	120
01:45 - 02:00	2	1	3	07:45 - 08:00	77	106	183	01:45 - 02:00	151	98	249	07:45 - 08:00	57	30	87
02:00 - 02:15	1	2	3	08:00 - 08:15	84	84	168	02:00 - 02:15	153	107	260	08:00 - 08:15	91	23	114
02:15 - 02:30	1	7	8	08:15 - 08:30	89	99	188	02:15 - 02:30	124	128	252	08:15 - 08:30	56	32	88
02:30 - 02:45	3	2	5	08:30 - 08:45	115	93	208	02:30 - 02:45	101	114	215	08:30 - 08:45	60	29	89
02:45 - 03:00	2	3	5	08:45 - 09:00	90	99	189	02:45 - 03:00	135	72	207	08:45 - 09:00	68	29	97
03:00 - 03:15	3	8	11	09:00 - 09:15	87	82	169	03:00 - 03:15	148	67	215	09:00 - 09:15	47	24	71
03:15 - 03:30	6	2	8	09:15 - 09:30	85	135	220	03:15 - 03:30	138	87	225	09:15 - 09:30	41	46	87
03:30 - 03:45	4	4	8	09:30 - 09:45	97	126	223	03:30 - 03:45	134	42	176	09:30 - 09:45	45	52	97

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

03:45 - 04:00	7	9	16	09:45 - 10:00	91	118	209	03:45 - 04:00	119	88	207	09:45 - 10:00	36	25	61
04:00 - 04:15	3	9	12	10:00 - 10:15	110	77	187	04:00 - 04:15	124	81	205	10:00 - 10:15	33	14	47
04:15 - 04:30	9	15	24	10:15 - 10:30	112	95	207	04:15 - 04:30	142	54	196	10:15 - 10:30	24	15	39
04:30 - 04:45	9	19	28	10:30 - 10:45	124	113	237	04:30 - 04:45	144	108	252	10:30 - 10:45	26	16	42
04:45 - 05:00	13	24	37	10:45 - 11:00	157	78	235	04:45 - 05:00	119	134	253	10:45 - 11:00	16	13	29
05:00 - 05:15	24	35	59	11:00 - 11:15	124	103	227	05:00 - 05:15	117	152	269	11:00 - 11:15	18	8	26
05:15 - 05:30	26	38	64	11:15 - 11:30	146	88	234	05:15 - 05:30	134	136	270	11:15 - 11:30	22	16	38
05:30 - 05:45	42	50	92	11:30 - 11:45	133	123	256	05:30 - 05:45	111	117	228	11:30 - 11:45	14	9	23
05:45 - 06:00	50	53	103	11:45 - 12:00	151	114	265	05:45 - 06:00	136	123	259	11:45 - 12:00	17	9	26

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

release 44 Set Screen Reader Mode On

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

Run Date: 01-SEP-20

State of Hawaii, Department of Transportation, Highways Division
15 Minute Volume Report

Site ID: B72008300358
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER
Location:

Town: Oahu
Count Type: CLASS
DATE: 17-OCT-18

DIR 1: +MP
Counter Type: Tube

DIR 2: -MP

Final AADT: 14600
Route No: 83

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM		
AM - PEAK HR VOLUME	444	452	896
AM - K FACTOR(%)			6.18
AM - D(%)	49.55	50.45	100
DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 AM to 09:00 AM	07:30 AM to 08:30 AM	
AM - PEAK HR VOLUME	444	505	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	3:15 PM to 4:15 PM		
PM - PEAK HR VOLUME	601	549	1,150
PM - K FACTOR(%)			7.93
PM -D(%)	52.26	47.74	100
DIRECTIONAL PEAK			
PM - PEAK HR TIME	3:45 PM to 4:45 PM	4:45 PM to 5:45 PM	
PM - PEAK HR VOLUME	602	582	

AM PERIOD (00:00-12:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	10:45 AM to 11:45 AM		
AM - PEAK HR VOLUME	488	508	984
AM - K FACTOR(%)			6.78
AM - D(%)	49.55	50.45	100

PM PERIOD (12:00-24:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	3:15 PM to 4:15 PM		
PM - PEAK HR VOLUME	601	650	1,150
PM - K FACTOR(%)			7.93
PM -D(%)	52.26	47.74	100

NON COMMUTER PERIOD (09:00-15:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PEAK HR TIME	2:00 PM to 3:00 PM		
PEAK HR VOLUME	623	512	1,135
DIRECTIONAL PEAK			
PEAK HR TIME	2:00 PM to 3:00 PM	2:00 PM to 3:00 PM	
PEAK HR VOLUME	623	512	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	TOTAL
AM 6-HR PERIOD (06:00-12:00)	2,421	2,645	5,066
AM 12-HR PERIOD (00:00-12:00)	2,692	3,024	5,716
PM 6-HR PERIOD (12:00-18:00)	3,351	3,004	6,355
PM 12-HR PERIOD (12:00-24:00)	4,684	4,110	8,794
24-HR PERIOD (12:00-24:00)	7,376	7,134	14,510
D%	50.83	49.17	100

TIME - AM	DIR1	DIR 2	TOTAL
12:00 - 12:15	6	7	13

TIME - AM	DIR1	DIR 2	TOTAL
06:00 - 06:15	64	49	113

TIME - PM	DIR1	DIR 2	TOTAL
12:00 - 12:15	133	107	240

TIME - PM	DIR1	DIR 2	TOTAL
06:00 - 06:15	102	87	189

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

12:15 - 12:30	13	8	21	06:15 - 06:30	59	72	131	12:15 - 12:30	140	105	245	06:15 - 06:30	116	169	285
12:30 - 12:45	8	7	15	06:30 - 06:45	70	83	153	12:30 - 12:45	124	111	235	06:30 - 06:45	79	162	241
12:45 - 01:00	9	4	13	06:45 - 07:00	76	93	169	12:45 - 01:00	149	96	245	06:45 - 07:00	104	116	220
01:00 - 01:15	2	9	11	07:00 - 07:15	71	95	166	01:00 - 01:15	143	112	255	07:00 - 07:15	80	81	161
01:15 - 01:30	3	6	9	07:15 - 07:30	80	95	175	01:15 - 01:30	127	126	253	07:15 - 07:30	78	60	138
01:30 - 01:45	6	5	11	07:30 - 07:45	87	139	226	01:30 - 01:45	140	115	255	07:30 - 07:45	65	32	97
01:45 - 02:00	2	4	6	07:45 - 08:00	84	141	225	01:45 - 02:00	136	77	213	07:45 - 08:00	56	40	96
02:00 - 02:15	2	6	8	08:00 - 08:15	102	114	216	02:00 - 02:15	152	119	271	08:00 - 08:15	73	30	103
02:15 - 02:30	4	5	9	08:15 - 08:30	102	111	213	02:15 - 02:30	126	148	274	08:15 - 08:30	65	32	97
02:30 - 02:45	2	3	5	08:30 - 08:45	126	105	231	02:30 - 02:45	178	115	293	08:30 - 08:45	58	36	94
02:45 - 03:00	1	2	3	08:45 - 09:00	114	122	236	02:45 - 03:00	167	130	297	08:45 - 09:00	79	28	107
03:00 - 03:15	4	7	11	09:00 - 09:15	108	110	218	03:00 - 03:15	153	100	253	09:00 - 09:15	61	32	93
03:15 - 03:30	11	10	21	09:15 - 09:30	108	129	237	03:15 - 03:30	152	137	289	09:15 - 09:30	51	35	86
03:30 - 03:45	4	7	11	09:30 - 09:45	115	113	228	03:30 - 03:45	125	155	280	09:30 - 09:45	47	45	92

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

03:45 - 04:00	2	7	9	09:45 - 10:00	113	115	228	03:45 - 04:00	164	134	298	09:45 - 10:00	43	15	58
04:00 - 04:15	6	13	19	10:00 - 10:15	104	129	233	04:00 - 04:15	160	123	283	10:00 - 10:15	44	8	52
04:15 - 04:30	9	15	24	10:15 - 10:30	117	121	238	04:15 - 04:30	141	148	289	10:15 - 10:30	27	12	39
04:30 - 04:45	10	14	24	10:30 - 10:45	108	107	215	04:30 - 04:45	137	134	271	10:30 - 10:45	23	15	38
04:45 - 05:00	14	31	45	10:45 - 11:00	105	139	244	04:45 - 05:00	126	139	265	10:45 - 11:00	18	18	36
05:00 - 05:15	25	33	58	11:00 - 11:15	105	108	213	05:00 - 05:15	124	143	267	11:00 - 11:15	21	13	34
05:15 - 05:30	36	45	81	11:15 - 11:30	140	119	259	05:15 - 05:30	143	148	291	11:15 - 11:30	10	13	23
05:30 - 05:45	38	64	102	11:30 - 11:45	138	130	268	05:30 - 05:45	99	152	251	11:30 - 11:45	24	13	37
05:45 - 06:00	54	67	121	11:45 - 12:00	125	106	231	05:45 - 06:00	112	130	242	11:45 - 12:00	9	14	23

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

release 44 Set Screen Reader Mode On

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

Run Date: 01-SEP-20

State of Hawaii, Department of Transportation, Highways Division
15 Minute Volume Report

Site ID: B72008300358 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 16800
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83
Location: **DATE: 28-FEB-19**

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	07:30 to 08:30 AM		
AM - PEAK HR VOLUME	405	596	1,001
AM - K FACTOR(%)			5.99
AM - D(%)	40.46	59.54	100
DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:00 to 09:00 AM	07:30 to 08:30 AM	
AM - PEAK HR VOLUME	445	596	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 to 04:00 PM		
PM - PEAK HR VOLUME	667	697	1,364
PM - K FACTOR(%)			8.16
PM -D(%)	48.9	51.1	100
DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 to 04:00 PM	04:00 to 05:00 PM	
PM - PEAK HR VOLUME	667	734	

AM PERIOD (00:00-12:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:45 to 12:45 PM		
AM - PEAK HR VOLUME	630	630	1,226
AM - K FACTOR(%)			7.34
AM - D(%)	40.46	59.54	100

PM PERIOD (12:00-24:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 to 04:00 PM		
PM - PEAK HR VOLUME	667	696	1,364
PM - K FACTOR(%)			8.16
PM -D(%)	48.9	51.1	100

NON COMMUTER PERIOD (09:00-15:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PEAK HR TIME	02:45 to 03:45 PM		
PEAK HR VOLUME	676	674	1,350
DIRECTIONAL PEAK			
PEAK HR TIME	01:00 to 02:00 PM	02:45 to 03:45 PM	
PEAK HR VOLUME	696	674	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	TOTAL
AM 6-HR PERIOD (06:00-12:00)	2,644	2,986	5,630
AM 12-HR PERIOD (00:00-12:00)	2,950	3,335	6,285
PM 6-HR PERIOD (12:00-18:00)	3,759	3,798	7,557
PM 12-HR PERIOD (12:00-24:00)	5,312	5,116	10,428
24-HR PERIOD (12:00-24:00)	8,262	8,451	16,713
D%	49.43	50.57	100

TIME - AM	DIR1	DIR 2	TOTAL
12:00 - 12:15	10	7	17
12:15 - 12:30	12	6	18

TIME - AM	DIR1	DIR 2	TOTAL
06:00 - 06:15	84	75	159
06:15 - 06:30	78	71	149

TIME - PM	DIR1	DIR 2	TOTAL
12:00 - 12:15	157	135	292
12:15 - 12:30	159	137	296

TIME - PM	DIR1	DIR 2	TOTAL
06:00 - 06:15	140	109	249
06:15 - 06:30	131	116	247

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

12:30 - 12:45	13	6	19	06:30 - 06:45	55	79	134	12:30 - 12:45	174	162	336	06:30 - 06:45	108	130	238
12:45 - 01:00	5	4	9	06:45 - 07:00	65	80	145	12:45 - 01:00	153	155	308	06:45 - 07:00	98	156	254
01:00 - 01:15	3	4	7	07:00 - 07:15	90	97	187	01:00 - 01:15	173	151	324	07:00 - 07:15	94	119	213
01:15 - 01:30	3	2	5	07:15 - 07:30	107	105	212	01:15 - 01:30	187	162	349	07:15 - 07:30	75	100	175
01:30 - 01:45	3	9	12	07:30 - 07:45	107	184	291	01:30 - 01:45	176	142	318	07:30 - 07:45	90	71	161
01:45 - 02:00	1	5	6	07:45 - 08:00	93	166	259	01:45 - 02:00	160	131	291	07:45 - 08:00	82	56	138
02:00 - 02:15	1	2	3	08:00 - 08:15	102	118	220	02:00 - 02:15	156	159	315	08:00 - 08:15	69	49	118
02:15 - 02:30	1	1	2	08:15 - 08:30	103	128	231	02:15 - 02:30	183	160	343	08:15 - 08:30	67	34	101
02:30 - 02:45	2	3	5	08:30 - 08:45	109	115	224	02:30 - 02:45	151	164	315	08:30 - 08:45	78	43	121
02:45 - 03:00	5	4	9	08:45 - 09:00	131	123	254	02:45 - 03:00	164	152	316	08:45 - 09:00	72	38	110
03:00 - 03:15	5	4	9	09:00 - 09:15	100	123	223	03:00 - 03:15	170	162	332	09:00 - 09:15	60	41	101
03:15 - 03:30	4	6	10	09:15 - 09:30	98	91	189	03:15 - 03:30	175	188	363	09:15 - 09:30	57	46	103
03:30 - 03:45	6	6	12	09:30 - 09:45	115	126	241	03:30 - 03:45	167	172	339	09:30 - 09:45	51	23	74
03:45 - 04:00	5	15	20	09:45 - 10:00	123	177	300	03:45 - 04:00	155	175	330	09:45 - 10:00	52	38	90

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

04:00 - 04:15	3	10	13	10:00 - 10:15	99	153	252	04:00 - 04:15	140	180	320	10:00 - 10:15	41	35	76
04:15 - 04:30	8	10	18	10:15 - 10:30	131	140	271	04:15 - 04:30	155	165	320	10:15 - 10:30	36	22	58
04:30 - 04:45	11	20	31	10:30 - 10:45	131	142	273	04:30 - 04:45	147	195	342	10:30 - 10:45	36	19	55
04:45 - 05:00	13	21	34	10:45 - 11:00	117	135	252	04:45 - 05:00	125	194	319	10:45 - 11:00	37	17	54
05:00 - 05:15	18	44	62	11:00 - 11:15	160	118	278	05:00 - 05:15	125	116	241	11:00 - 11:15	21	12	33
05:15 - 05:30	42	43	85	11:15 - 11:30	169	139	308	05:15 - 05:30	141	141	282	11:15 - 11:30	21	19	40
05:30 - 05:45	50	63	113	11:30 - 11:45	137	139	276	05:30 - 05:45	134	161	295	11:30 - 11:45	17	13	30
05:45 - 06:00	82	54	136	11:45 - 12:00	140	162	302	05:45 - 06:00	132	139	271	11:45 - 12:00	20	12	32

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

Run Date: 01-SEP-20

State of Hawaii, Department of Transportation, Highways Division
15 Minute Volume Report

Site ID: B72008300358 **Town:** Oahu **DIR 1:** +MP **DIR 2:** -MP **Final AADT:** 16800
Functional Class: URBAN:PRINCIPAL ARTERIAL - OTHER **Count Type:** CLASS **Counter Type:** Tube **Route No:** 83
Location: **DATE: 01-MAR-19**

AM COMMUTER PERIOD (05:00-09:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:45 to 09:45 AM		
AM - PEAK HR VOLUME	478	584	1,062
AM - K FACTOR(%)			6.34
AM - D(%)	45.01	54.99	100
DIRECTIONAL PEAK			
AM - PEAK HR TIME	08:45 to 09:45 AM	08:45 to 09:45 AM	
AM - PEAK HR VOLUME	478	584	

PM COMMUTER PERIOD (15:00-19:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	04:30 to 05:30 PM		
PM - PEAK HR VOLUME	595	725	1,320
PM - K FACTOR(%)			7.89
PM -D(%)	45.08	54.92	100
DIRECTIONAL PEAK			
PM - PEAK HR TIME	03:00 to 04:00 PM	04:30 to 05:30 PM	
PM - PEAK HR VOLUME	613	725	

AM PERIOD (00:00-12:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
AM - PEAK HR TIME	11:45 to 12:45 PM		
AM - PEAK HR VOLUME	607	616	1,150
AM - K FACTOR(%)			6.87
AM - D(%)	45.01	54.99	100

PM PERIOD (12:00-24:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PM - PEAK HR TIME	04:30 to 05:30 PM		
PM - PEAK HR VOLUME	595	655	1,320
PM - K FACTOR(%)			7.89
PM -D(%)	45.08	54.92	100

NON COMMUTER PERIOD (09:00-15:00)	DIR 1	DIR 2	TOTAL
TWO DIRECTIONAL PEAK			
PEAK HR TIME	12:30 to 01:30 PM		
PEAK HR VOLUME	628	667	1,295
DIRECTIONAL PEAK			
PEAK HR TIME	12:15 to 01:15 PM	02:30 to 03:30 PM	
PEAK HR VOLUME	655	698	

6-HR, 12-HR, 24-HR PERIODS	DIR 1	DIR 2	TOTAL
AM 6-HR PERIOD (06:00-12:00)	2,658	2,866	5,524
AM 12-HR PERIOD (00:00-12:00)	2,891	3,221	6,112
PM 6-HR PERIOD (12:00-18:00)	3,600	3,908	7,508
PM 12-HR PERIOD (12:00-24:00)	5,329	5,297	10,626
24-HR PERIOD (12:00-24:00)	8,220	8,518	16,738
D%	49.11	50.89	100

TIME - AM	DIR1	DIR 2	TOTAL
12:00 - 12:15	14	5	19
12:15 - 12:30	13	7	20

TIME - AM	DIR1	DIR 2	TOTAL
06:00 - 06:15	46	79	125
06:15 - 06:30	55	60	115

TIME - PM	DIR1	DIR 2	TOTAL
12:00 - 12:15	146	124	270
12:15 - 12:30	181	124	305

TIME - PM	DIR1	DIR 2	TOTAL
06:00 - 06:15	116	87	203
06:15 - 06:30	127	109	236

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

12:30 - 12:45	4	11	15	06:30 - 06:45	84	57	141	12:30 - 12:45	159	169	328	06:30 - 06:45	106	131	237
12:45 - 01:00	4	4	8	06:45 - 07:00	92	70	162	12:45 - 01:00	153	152	305	06:45 - 07:00	115	147	262
01:00 - 01:15	5	1	6	07:00 - 07:15	82	101	183	01:00 - 01:15	162	181	343	07:00 - 07:15	93	128	221
01:15 - 01:30	4	2	6	07:15 - 07:30	97	117	214	01:15 - 01:30	154	165	319	07:15 - 07:30	92	93	185
01:30 - 01:45	6	6	12	07:30 - 07:45	106	128	234	01:30 - 01:45	142	145	287	07:30 - 07:45	106	69	175
01:45 - 02:00	2	5	7	07:45 - 08:00	94	108	202	01:45 - 02:00	155	161	316	07:45 - 08:00	97	71	168
02:00 - 02:15	3	3	6	08:00 - 08:15	112	103	215	02:00 - 02:15	164	137	301	08:00 - 08:15	85	42	127
02:15 - 02:30	4	5	9	08:15 - 08:30	107	134	241	02:15 - 02:30	143	170	313	08:15 - 08:30	83	45	128
02:30 - 02:45	4	3	7	08:30 - 08:45	108	129	237	02:30 - 02:45	134	188	322	08:30 - 08:45	86	40	126
02:45 - 03:00	3	4	7	08:45 - 09:00	118	126	244	02:45 - 03:00	151	145	296	08:45 - 09:00	69	46	115
03:00 - 03:15	9	5	14	09:00 - 09:15	117	144	261	03:00 - 03:15	145	172	317	09:00 - 09:15	78	36	114
03:15 - 03:30	4	8	12	09:15 - 09:30	113	159	272	03:15 - 03:30	158	193	351	09:15 - 09:30	65	38	103
03:30 - 03:45	5	2	7	09:30 - 09:45	130	155	285	03:30 - 03:45	153	178	331	09:30 - 09:45	66	43	109
03:45 - 04:00	7	10	17	09:45 - 10:00	116	149	265	03:45 - 04:00	157	163	320	09:45 - 10:00	67	34	101

HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

04:00 - 04:15	6	10	16	10:00 - 10:15	100	130	230	04:00 - 04:15	128	152	280	10:00 - 10:15	65	25	90
04:15 - 04:30	4	15	19	10:15 - 10:30	107	129	236	04:15 - 04:30	147	164	311	10:15 - 10:30	38	44	82
04:30 - 04:45	12	11	23	10:30 - 10:45	137	134	271	04:30 - 04:45	161	208	369	10:30 - 10:45	37	37	74
04:45 - 05:00	13	29	42	10:45 - 11:00	150	142	292	04:45 - 05:00	154	182	336	10:45 - 11:00	39	31	70
05:00 - 05:15	22	32	54	11:00 - 11:15	143	135	278	05:00 - 05:15	121	166	287	11:00 - 11:15	24	30	54
05:15 - 05:30	27	54	81	11:15 - 11:30	167	132	299	05:15 - 05:30	159	169	328	11:15 - 11:30	28	25	53
05:30 - 05:45	24	60	84	11:30 - 11:45	156	119	275	05:30 - 05:45	147	156	303	11:30 - 11:45	28	19	47
05:45 - 06:00	34	63	97	11:45 - 12:00	121	126	247	05:45 - 06:00	126	144	270	11:45 - 12:00	19	19	38

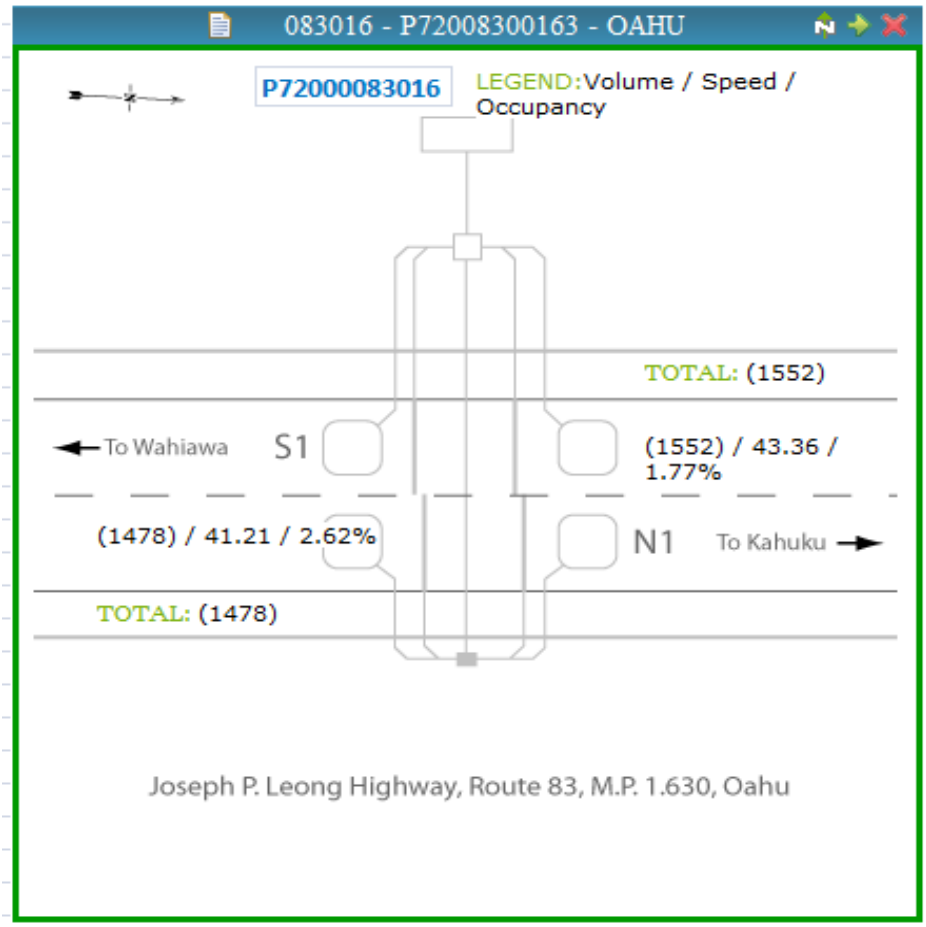
HDOT RIMS Traffic Station Analyzer (v44)

Log Out Print RS

APPENDIX B

TRAFFIC COUNT DATA

JP Leong Highway south of Kamehameha Highway


083016 - P72008300163 - OAHU
P72000083016
LEGEND:Volume / Speed / Occupancy
TOTAL: (1552)
To Wahiawa
S1
(1552) / 43.36 / 1.77%
(1478) / 41.21 / 2.62%
N1
To Kahuku
TOTAL: (1478)
Joseph P. Leong Highway, Route 83, M.P. 1.630, Oahu

STATION: 083016
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2016 - 2016
LOC'N 21.598398 -158.099586

Oahu
DIRECTION 01 (D1): Northbound, MOV 1
DIRECTION 02 (D2): Southbound, MOV 5

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	10714	10848	11140	11526	12384	12523	11246	11322	11483	0.99548	1.00961
February	10725	11313	11501	11401	12166	12875	10797	11421	11539	0.99061	1.00089
March	10944	10806	10697	11053	11287	12439	10945	10957	11167	1.02364	1.04324
April	10384	10722	10853	10967	11809	12847	11057	10947	11234	1.01754	1.04424
May	10527	10716	10595	11205	11883	12617	11792	10985	11334	1.00860	1.04059
June	10857	11290	11077	11600	11839	13262	11699	11333	11660	0.98033	1.00870
July	10866	11708	11563	11923	12623	13625	12119	11737	12061	0.94777	0.97396
August	10745	11359	10964	11718	12350	13151	10824	11427	11587	0.98653	1.00036
September	10214	10762	10521	10734	11421	11809	11124	10730	10940	1.04485	1.06533
October	10765	11116	10762	11316	11565	12415	10933	11105	11267	1.01455	1.02941
November	10598	10625	11004	11461	11712	12675	11153	11080	11318	1.00998	1.03171
December	11796	12090	12004	11471	12084	11349	10278	11889	11582	0.98700	0.96149
AVERAGE	10761	11113	11057	11364	11927	12632	11164	AVERAGE 11244	D1+D2 AADT 11431		

K-FACTOR 9.48%
K-FACTOR PERIOD PM
D-FACTOR 52.40%

STATION: 083016
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2016 - 2016
LOC'N 21.598398 -158.099586

Oahu
DIRECTION 01 (D1): Northbound, MOV 1

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	5458	5480	5681	5874	6394	6473	5690	5777	5864	0.99534	1.01030
February	5507	5888	5966	5846	6263	6649	5457	5894	5939	0.98276	0.99033
March	5609	5510	5443	5696	5815	6414	5511	5614	5714	1.02154	1.03964
April	5254	5449	5491	5626	6075	6667	5537	5579	5728	1.01898	1.04627
May	5299	5382	5367	5694	6120	6542	6006	5572	5773	1.01111	1.04750
June	5564	5768	5621	5926	6102	6931	5979	5796	5985	0.97533	1.00700
July	5531	5978	5901	6109	6544	7080	6144	6012	6184	0.94391	0.97081
August	5365	5735	5556	5973	6366	6659	5423	5799	5868	0.99470	1.00654
September	5098	5422	5327	5407	5811	6111	5614	5413	5542	1.05329	1.07827
October	5390	5638	5483	5765	5944	6437	5500	5644	5737	1.01748	1.03420
November	5394	5373	5545	5899	6053	6587	5602	5653	5779	1.01005	1.03260
December	6049	6159	6111	5834	6238	5842	5284	6078	5931	0.98411	0.96026
AVERAGE	5460	5648	5624	5804	6144	6533	5645	AVERAGE 5736	D1 AADT 5837		

STATION: 083016
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2016 - 2016
LOC'N 21.598398 -158.099586
Oahu
DIRECTION 02 (D2): Southbound, MOV 5

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	5256	5368	5458	5653	5990	6050	5556	5545	5619	0.99564	1.00889
February	5218	5425	5535	5555	5903	6225	5340	5527	5600	0.99895	1.01214
March	5336	5296	5254	5356	5473	6025	5434	5343	5453	1.02583	1.04703
April	5130	5273	5363	5341	5734	6181	5520	5368	5506	1.01605	1.04214
May	5227	5335	5228	5511	5763	6075	5786	5413	5561	1.00600	1.03349
June	5292	5522	5455	5675	5737	6331	5720	5536	5676	0.98561	1.01047
July	5336	5731	5662	5815	6079	6545	5975	5724	5877	0.95183	0.97727
August	5380	5624	5408	5745	5983	6492	5402	5628	5719	0.97816	0.99400
September	5116	5339	5194	5327	5610	5698	5510	5317	5399	1.03618	1.05216
October	5375	5478	5279	5551	5622	5978	5433	5461	5531	1.01151	1.02446
November	5204	5252	5459	5562	5659	6088	5552	5427	5539	1.00991	1.03077
December	5747	5931	5893	5636	5846	5507	4994	5811	5651	0.99003	0.96277
AVERAGE	5301	5464	5432	5560	5783	6100	5518	AVERAGE 5508	D2 AADT 5594		

January, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
1/1/2016	Fri	*		50.2	49.8	5127	5089	10216	1852	1086	2938	502	248	3275	4003	7278	568	620
1/2/2016	Sat			51.2	48.8	6223	5922	12145	2212	1498	3710	606	340	4011	4424	8435	562	545
1/3/2016	Sun			50.7	49.3	5510	5360	10870	2275	1384	3659	549	311	3235	3976	7211	490	493
1/4/2016	Mon			51.6	48.4	6105	5718	11823	2465	1995	4460	562	300	3640	3723	7363	438	531
1/5/2016	Tue			51.0	49.0	5639	5416	11055	2078	2098	4176	473	319	3561	3318	6879	455	465
1/6/2016	Wed			51.0	49.0	5562	5339	10901	2146	2104	4250	426	310	3416	3235	6651	447	505
1/7/2016	Thu			50.6	49.4	5886	5751	11637	2240	2128	4368	468	267	3646	3623	7269	492	560
1/8/2016	Fri			51.1	48.9	6244	5968	12212	2392	2307	4699	444	324	3852	3661	7513	518	527
1/9/2016	Sat			51.7	48.3	6141	5732	11873	2286	1753	4039	516	358	3855	3979	7834	436	580
1/10/2016	Sun			50.4	49.6	5492	5415	10907	2196	1518	3714	524	323	3296	3897	7193	396	533
1/11/2016	Mon			50.6	49.4	5026	4911	9937	1773	2092	3865	337	292	3253	2819	6072	457	444
1/12/2016	Tue			50.7	49.3	5518	5360	10878	2038	2185	4223	373	302	3480	3175	6655	474	476
1/13/2016	Wed			51.1	48.9	5714	5469	11183	2176	2217	4393	368	332	3538	3252	6790	512	490
1/14/2016	Thu			51.0	49.0	5974	5748	11722	2274	2350	4624	384	353	3700	3398	7098	523	521
1/15/2016	Fri			52.0	48.0	6781	6269	13050	2602	2477	5079	546	409	4179	3792	7971	523	532
1/16/2016	Sat			51.2	48.8	6134	5839	11973	2368	1817	4185	536	362	3766	4022	7788	388	606
1/17/2016	Sun			50.3	49.7	5556	5482	11038	2176	1501	3677	515	337	3380	3981	7361	417	507
1/18/2016	Mon	*		49.8	50.2	6293	6336	12629	2615	1843	4458	613	390	3678	4493	8171	455	704
1/19/2016	Tue			49.9	50.1	5404	5432	10836	2095	2201	4296	449	293	3309	3231	6540	438	465
1/20/2016	Wed			50.8	49.2	5472	5303	10775	1981	2278	4259	423	300	3491	3025	6516	440	512
1/21/2016	Thu			50.9	49.1	5604	5416	11020	1974	2224	4198	413	281	3630	3192	6822	442	478
1/22/2016	Fri			51.5	48.5	6212	5860	12072	2291	2240	4531	412	327	3921	3620	7541	506	522
1/23/2016	Sat			51.8	48.2	6789	6306	13095	2719	1840	4559	592	438	4070	4466	8536	545	512
1/24/2016	Sun			49.0	51.0	5570	5787	11357	2446	1740	4186	516	366	3124	4047	7171	384	529
1/25/2016	Mon			50.5	49.5	5244	5139	10383	1896	2074	3970	396	278	3348	3065	6413	443	463
1/26/2016	Tue			50.5	49.5	5360	5263	10623	1916	2118	4034	405	285	3444	3145	6589	426	462
1/27/2016	Wed			51.1	48.9	5977	5722	11699	2421	2236	4657	495	292	3556	3486	7042	508	449
1/28/2016	Thu			51.4	48.6	6030	5696	11726	2565	2243	4808	456	327	3465	3453	6918	442	455
1/29/2016	Fri			51.9	48.1	6337	5863	12200	2698	2157	4855	448	321	3639	3706	7345	455	506
1/30/2016	Sat			52.3	47.7	7078	6453	13531	3098	1960	5058	591	386	3980	4493	8473	575	487
1/31/2016	Sun			52.4	47.6	6321	5737	12058	2718	1673	4391	547	395	3603	4064	7667	577	411

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

February, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1

DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
2/1/2016	Mon			51.6	48.4	5666	5324	10990	2186	2151	4337	424	279	3480	3173	6653	420	459
2/2/2016	Tue			50.7	49.3	5746	5577	11323	2217	2114	4331	400	300	3529	3463	6992	484	555
2/3/2016	Wed			51.1	48.9	5644	5402	11046	2165	2245	4410	417	279	3479	3157	6636	481	471
2/4/2016	Thu			51.5	48.5	6139	5770	11909	2437	2271	4708	471	344	3702	3499	7201	552	467
2/5/2016	Fri			51.6	48.4	6494	6080	12574	2549	2363	4912	392	382	3945	3717	7662	566	471
2/6/2016	Sat			51.8	48.2	6273	5836	12109	2537	1936	4473	537	368	3736	3900	7636	408	627
2/7/2016	Sun			50.5	49.5	4369	4280	8649	1636	1411	3047	380	318	2733	2869	5602	424	330
2/8/2016	Mon			50.2	49.8	5420	5367	10787	1907	2206	4113	368	310	3513	3161	6674	478	462
2/9/2016	Tue			55.3	44.7	7063	5704	12767	2196	2245	4441	423	316	4867	3459	8326	509	475
2/10/2016	Wed			51.0	49.0	6319	6078	12397	3910	2805	6715	682	192	2409	3273	5682	284	406
2/11/2016	Thu			50.5	49.5	5436	5338	10774	2015	2155	4170	437	270	3421	3183	6604	436	461
2/12/2016	Fri			51.5	48.5	6233	5866	12099	2240	2249	4489	421	342	3993	3617	7610	530	491
2/13/2016	Sat			52.0	48.0	7009	6459	13468	2822	1930	4752	614	386	4187	4529	8716	594	461
2/14/2016	Sun			51.7	48.3	6407	5992	12399	2645	1517	4162	651	341	3762	4475	8237	563	488
2/15/2016	Mon	*		50.5	49.5	6318	6193	12511	2498	1868	4366	586	375	3820	4325	8145	551	552
2/16/2016	Tue			50.9	49.1	5419	5218	10637	2015	2320	4335	423	334	3404	2898	6302	487	465
2/17/2016	Wed			50.4	49.6	5382	5297	10679	1919	2338	4257	377	318	3463	2959	6422	480	459
2/18/2016	Thu			50.0	50.0	5593	5589	11182	2162	2341	4503	420	338	3431	3248	6679	424	483
2/19/2016	Fri			51.3	48.7	6062	5763	11825	2277	2239	4516	427	343	3785	3524	7309	521	460
2/20/2016	Sat			51.5	48.5	6890	6500	13390	2886	2039	4925	580	442	4004	4461	8465	557	511
2/21/2016	Sun			50.6	49.4	5443	5315	10758	2161	1564	3725	495	318	3282	3751	7033	465	583
2/22/2016	Mon			53.3	46.7	5597	4897	10494	2222	2144	4366	483	274	3375	2753	6128	464	359
2/23/2016	Tue			50.6	49.4	5324	5201	10525	1885	2218	4103	376	292	3439	2983	6422	445	456
2/24/2016	Wed			54.9	45.1	6518	5364	11882	1968	2196	4164	373	293	4550	3168	7718	501	434
2/25/2016	Thu			52.9	47.1	6214	5523	11737	3665	1568	5233	462	237	2549	3955	6504	352	449
2/26/2016	Fri		1	51.8	48.2	6016	5604	11620	2162	2262	4424	427	324	3854	3342	7196	489	443
2/27/2016	Sat			51.3	48.7	6425	6106	12531	2542	1693	4235	530	291	3883	4413	8296	555	436
2/28/2016	Sun			49.3	50.7	5607	5773	11380	2401	1686	4087	522	346	3206	4087	7293	495	438
2/29/2016	Mon			50.3	49.7	5345	5282	10627	1806	2196	4002	369	284	3539	3086	6625	434	448

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

March, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
3/1/2016	Tue			51.6	48.4	5602	5245	10847	2028	2237	4265	449	287	3574	3008	6582	535	431
3/2/2016	Wed			50.9	49.1	5282	5099	10381	1902	2153	4055	377	291	3380	2946	6326	437	398
3/3/2016	Thu			51.0	49.0	5445	5223	10668	1991	2200	4191	364	293	3454	3023	6477	474	440
3/4/2016	Fri			51.6	48.4	5970	5606	11576	2167	2140	4307	423	310	3803	3466	7269	520	467
3/5/2016	Sat			52.6	47.4	6766	6103	12869	3008	1961	4969	491	405	3758	4142	7900	481	541
3/6/2016	Sun			50.0	50.0	5448	5444	10892	2156	1532	3688	541	310	3292	3912	7204	547	420
3/7/2016	Mon			50.6	49.4	5311	5193	10504	1942	2208	4150	406	281	3369	2985	6354	455	462
3/8/2016	Tue			50.4	49.6	5020	4944	9964	2017	2314	4331	270	423	3003	2630	5633	373	473
3/9/2016	Wed			50.3	49.7	5136	5080	10216	1827	2164	3991	398	309	3309	2916	6225	445	399
3/10/2016	Thu			51.4	48.6	5383	5097	10480	1960	2077	4037	389	274	3423	3020	6443	482	479
3/11/2016	Fri			51.1	48.9	5826	5575	11401	2045	2291	4336	267	424	3781	3284	7065	478	472
3/12/2016	Sat			50.2	49.8	5774	5735	11509	2178	1774	3952	436	343	3596	3961	7557	432	578
3/13/2016	Sun			50.2	49.8	5395	5345	10740	2294	1574	3868	510	315	3101	3771	6872	468	423
3/14/2016	Mon			51.0	49.0	5318	5102	10420	2139	2158	4297	420	291	3179	2944	6123	396	462
3/15/2016	Tue			50.9	49.1	5565	5359	10924	2218	2137	4355	435	342	3347	3222	6569	440	484
3/16/2016	Wed			50.7	49.3	5249	5100	10349	1859	2106	3965	387	286	3390	2994	6384	466	431
3/17/2016	Thu			52.0	48.0	5764	5321	11085	2001	2050	4051	431	305	3763	3271	7034	523	478
3/18/2016	Fri			51.9	48.1	5648	5237	10885	2037	2148	4185	443	334	3611	3089	6700	485	455
3/19/2016	Sat			52.2	47.8	6476	5928	12404	2408	1745	4153	550	330	4068	4183	8251	533	507
3/20/2016	Sun			50.8	49.2	5690	5513	11203	2354	1551	3905	543	305	3336	3962	7298	539	436
3/21/2016	Mon			51.5	48.5	5833	5504	11337	2295	2115	4410	427	343	3538	3389	6927	488	490
3/22/2016	Tue			51.0	49.0	5898	5660	11558	2408	2203	4611	473	375	3490	3457	6947	509	466
3/23/2016	Wed			51.2	48.8	6033	5746	11779	2382	2223	4605	475	332	3651	3523	7174	427	534
3/24/2016	Thu			51.8	48.2	6270	5833	12103	2400	2248	4648	482	348	3870	3585	7455	543	487
3/25/2016	Fri	*		51.6	48.4	6112	5728	11840	2649	2395	5044	555	577	3463	3333	6796	474	394
3/26/2016	Sat			51.2	48.8	6639	6334	12973	2856	1903	4759	594	411	3783	4431	8214	522	549
3/27/2016	Sun	*		50.6	49.4	6149	5999	12148	2861	1516	4377	604	364	3288	4483	7771	537	427
3/28/2016	Mon			51.9	48.1	5972	5543	11515	2321	2083	4404	482	322	3651	3460	7111	456	490
3/29/2016	Tue			50.9	49.1	5463	5272	10735	1952	2159	4111	423	261	3511	3113	6624	443	494
3/30/2016	Wed			51.2	48.8	5513	5247	10760	2139	2237	4376	415	296	3374	3010	6384	447	440
3/31/2016	Thu			51.4	48.6	5620	5307	10927	2208	2290	4498	408	322	3412	3017	6429	488	450

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

April, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
4/1/2016	Fri			52.0	48.0	5934	5476	11410	2237	2251	4488	439	347	3697	3225	6922	581	406
4/2/2016	Sat			52.0	48.0	6638	6120	12758	2701	1905	4606	517	370	3937	4215	8152	616	473
4/3/2016	Sun			50.0	50.0	6108	6106	12214	2598	1614	4212	522	318	3510	4492	8002	531	463
4/4/2016	Mon			51.0	49.0	5352	5151	10503	2105	2152	4257	403	288	3247	2999	6246	426	409
4/5/2016	Tue			50.8	49.2	5334	5161	10495	2089	2187	4276	414	271	3245	2974	6219	462	437
4/6/2016	Wed			50.6	49.4	5331	5212	10543	1906	2216	4122	363	301	3425	2996	6421	450	428
4/7/2016	Thu			52.6	47.4	5368	4838	10206	1894	1812	3706	332	398	3474	3026	6500	494	407
4/8/2016	Fri			52.0	48.0	6431	5945	12376	2450	2328	4778	350	434	3981	3617	7598	555	475
4/9/2016	Sat			51.5	48.5	6917	6508	13425	2929	2009	4938	627	405	3988	4499	8487	569	533
4/10/2016	Sun			50.3	49.7	5863	5803	11666	2679	1624	4303	575	350	3184	4179	7363	506	491
4/11/2016	Mon			50.7	49.3	5307	5158	10465	1956	2164	4120	395	289	3351	2994	6345	460	413
4/12/2016	Tue			50.9	49.1	5321	5140	10461	2016	2125	4141	418	267	3305	3015	6320	442	495
4/13/2016	Wed			51.0	49.0	5462	5254	10716	2054	2186	4240	337	342	3408	3068	6476	420	507
4/14/2016	Thu			51.4	48.6	5674	5366	11040	2134	2148	4282	421	291	3540	3218	6758	467	480
4/15/2016	Fri			51.5	48.5	6119	5753	11872	2264	2355	4619	389	346	3855	3398	7253	487	448
4/16/2016	Sat			51.8	48.2	6311	5879	12190	2556	1881	4437	501	364	3755	3998	7753	576	384
4/17/2016	Sun			49.3	50.7	4601	4729	9330	1950	1643	3593	388	344	2651	3086	5737	380	530
4/18/2016	Mon			50.4	49.6	5133	5045	10178	1804	2100	3904	265	366	3329	2945	6274	429	433
4/19/2016	Tue			51.6	48.4	5573	5232	10805	2139	2129	4268	399	280	3434	3103	6537	479	432
4/20/2016	Wed			50.5	49.5	5566	5465	11031	2098	2282	4380	399	326	3468	3183	6651	440	460
4/21/2016	Thu			50.4	49.6	5738	5639	11377	2190	2261	4451	394	336	3548	3378	6926	517	504
4/22/2016	Fri			51.3	48.7	6181	5869	12050	2184	2210	4394	360	370	3997	3659	7656	510	489
4/23/2016	Sat			51.8	48.2	6526	6063	12589	2971	1956	4927	608	396	3555	4107	7662	511	461
4/24/2016	Sun			50.6	49.4	5574	5443	11017	2398	1583	3981	494	316	3176	3860	7036	507	397
4/25/2016	Mon			50.3	49.7	5223	5165	10388	1982	2150	4132	374	310	3241	3015	6256	435	433
4/26/2016	Tue			50.0	50.0	5568	5558	11126	2152	2252	4404	331	440	3416	3306	6722	437	481
4/27/2016	Wed			50.4	49.6	5603	5520	11123	2097	2315	4412	275	462	3506	3205	6711	499	433
4/28/2016	Thu			50.9	49.1	5724	5520	11244	2213	2271	4484	277	468	3511	3249	6760	469	464
4/29/2016	Fri			50.4	49.6	5708	5628	11336	2130	2193	4323	401	285	3578	3435	7013	437	495
4/30/2016	Sat			52.3	47.7	6942	6333	13275	2898	1858	4756	524	366	4044	4475	8519	591	487

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

May, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
5/1/2016	Sun			50.3	49.7	6093	6013	12106	2630	1724	4354	549	393	3463	4289	7752	506	542
5/2/2016	Mon			50.0	50.0	5206	5214	10420	1914	2188	4102	291	388	3292	3026	6318	459	431
5/3/2016	Tue			50.8	49.2	5133	4970	10103	1932	2137	4069	375	274	3201	2833	6034	409	410
5/4/2016	Wed			50.6	49.4	5168	5052	10220	1860	2154	4014	390	290	3308	2898	6206	457	410
5/5/2016	Thu			50.6	49.4	5788	5658	11446	2446	2253	4699	405	340	3342	3405	6747	474	471
5/6/2016	Fri			51.1	48.9	5857	5604	11461	2198	2242	4440	404	305	3659	3362	7021	450	465
5/7/2016	Sat			50.8	49.2	5784	5592	11376	2066	1814	3880	478	347	3718	3778	7496	485	479
5/8/2016	Sun			51.0	49.0	5349	5140	10489	2078	1409	3487	511	325	3271	3731	7002	535	469
5/9/2016	Mon			50.6	49.4	5039	4911	9950	1816	2108	3924	245	366	3223	2803	6026	444	416
5/10/2016	Tue			50.3	49.7	5280	5217	10497	1868	2165	4033	350	291	3412	3052	6464	514	431
5/11/2016	Wed			50.7	49.3	5361	5209	10570	1994	2162	4156	374	286	3367	3047	6414	444	437
5/12/2016	Thu			51.0	49.0	5608	5384	10992	2087	2198	4285	407	269	3521	3186	6707	461	472
5/13/2016	Fri			52.3	47.7	6267	5705	11972	2279	2179	4458	439	306	3988	3526	7514	524	474
5/14/2016	Sat			51.5	48.5	6624	6229	12853	2884	2050	4934	546	389	3740	4179	7919	438	559
5/15/2016	Sun			50.1	49.9	6034	6005	12039	2412	1618	4030	563	342	3622	4387	8009	561	455
5/16/2016	Mon			50.2	49.8	5409	5359	10768	1958	2165	4123	415	289	3451	3194	6645	446	467
5/17/2016	Tue			50.0	50.0	5508	5517	11025	2091	2131	4222	410	296	3417	3386	6803	424	540
5/18/2016	Wed			50.3	49.7	5375	5303	10678	1902	2140	4042	413	298	3473	3163	6636	449	427
5/19/2016	Thu			50.6	49.4	5852	5721	11573	2215	2160	4375	416	315	3637	3561	7198	471	523
5/20/2016	Fri			51.9	48.1	6397	5932	12329	2512	2298	4810	483	303	3885	3634	7519	448	518
5/21/2016	Sat			51.6	48.4	6935	6507	13442	2727	1796	4523	522	379	4208	4711	8919	589	500
5/22/2016	Sun			50.9	49.1	6112	5897	12009	2605	1653	4258	589	371	3507	4244	7751	628	389
5/23/2016	Mon			50.5	49.5	5543	5425	10968	2111	2119	4230	463	276	3432	3306	6738	429	500
5/24/2016	Tue			49.2	50.8	5683	5864	11547	2066	2151	4217	427	289	3617	3713	7330	441	572
5/25/2016	Wed			51.0	49.0	5564	5349	10913	2155	2289	4444	298	424	3409	3060	6469	441	406
5/26/2016	Thu			51.1	48.9	5526	5282	10808	2265	2197	4462	381	329	3261	3085	6346	389	408
5/27/2016	Fri			50.6	49.4	5958	5812	11770	2342	2059	4401	495	312	3616	3753	7369	421	472
5/28/2016	Sat			53.3	46.7	6825	5973	12798	2833	1720	4553	599	327	3992	4253	8245	637	352
5/29/2016	Sun			52.3	47.7	6443	5876	12319	2769	1522	4291	649	289	3674	4354	8028	635	349
5/30/2016	Mon	*		50.8	49.2	6218	6026	12244	3131	1676	4807	662	331	3087	4350	7437	617	473
5/31/2016	Tue			51.0	49.0	5304	5106	10410	1932	2222	4154	346	366	3372	2884	6256	440	386

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

June, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
6/1/2016	Wed			50.8	49.2	5416	5239	10655	2002	2067	4069	428	275	3414	3172	6586	396	463
6/2/2016	Thu			50.8	49.2	5863	5684	11547	2305	2129	4434	476	293	3558	3555	7113	457	458
6/3/2016	Fri			51.2	48.8	6129	5836	11965	2309	2058	4367	492	320	3820	3778	7598	486	507
6/4/2016	Sat			51.6	48.4	6821	6409	13230	2990	1881	4871	630	384	3831	4528	8359	574	528
6/5/2016	Sun			51.0	49.0	5927	5696	11623	2311	1539	3850	544	385	3616	4157	7773	570	417
6/6/2016	Mon			51.4	48.6	5678	5373	11051	2197	2062	4259	485	290	3481	3311	6792	414	495
6/7/2016	Tue			50.7	49.3	5725	5557	11282	2198	2095	4293	417	313	3527	3462	6989	443	499
6/8/2016	Wed			50.8	49.2	5656	5478	11134	2192	2155	4347	441	302	3464	3323	6787	381	464
6/9/2016	Thu			51.2	48.8	6036	5757	11793	2464	2118	4582	435	283	3572	3639	7211	433	474
6/10/2016	Fri	*		51.9	48.1	6419	5957	12376	2503	1977	4480	532	338	3916	3980	7896	516	449
6/11/2016	Sat			52.3	47.7	6876	6281	13157	2823	1849	4672	564	367	4053	4432	8485	542	470
6/12/2016	Sun			51.0	49.0	5816	5586	11402	2326	1559	3885	545	325	3490	4027	7517	511	463
6/13/2016	Mon			50.9	49.1	5294	5101	10395	1943	2000	3943	407	283	3351	3101	6452	430	440
6/14/2016	Tue			51.3	48.7	5611	5330	10941	2170	1989	4159	451	265	3441	3341	6782	452	445
6/15/2016	Wed			50.2	49.8	5347	5308	10655	2036	2110	4146	377	304	3311	3198	6509	410	485
6/16/2016	Thu			51.5	48.5	5731	5400	11131	2239	2033	4272	428	284	3492	3367	6859	452	433
6/17/2016	Fri			51.2	48.8	6026	5733	11759	2274	2227	4501	471	314	3752	3506	7258	466	481
6/18/2016	Sat			52.5	47.5	6701	6056	12757	2717	1621	4338	619	308	3984	4435	8419	565	455
6/19/2016	Sun			50.4	49.6	5583	5489	11072	2474	1511	3985	540	315	3109	3978	7087	558	435
6/20/2016	Mon			51.1	48.9	5531	5296	10827	2083	2046	4129	422	310	3448	3250	6698	457	434
6/21/2016	Tue			50.8	49.2	5804	5613	11417	2235	2112	4347	457	288	3569	3501	7070	451	469
6/22/2016	Wed			51.1	48.9	5933	5688	11621	2228	2223	4451	396	329	3705	3465	7170	452	479
6/23/2016	Thu			51.2	48.8	6059	5776	11835	2377	2152	4529	442	313	3682	3624	7306	447	466
6/24/2016	Fri			52.2	47.8	6151	5642	11793	2257	2151	4408	449	342	3894	3491	7385	492	516
6/25/2016	Sat			52.7	47.3	7325	6577	13902	3020	1982	5002	587	447	4305	4595	8900	665	409
6/26/2016	Sun			51.9	48.1	6591	6107	12698	2858	1537	4395	647	363	3733	4570	8303	653	417
6/27/2016	Mon			51.6	48.4	5754	5399	11153	2193	2093	4286	508	307	3561	3306	6867	461	507
6/28/2016	Tue			51.5	48.5	5933	5588	11521	2302	1980	4282	466	320	3631	3608	7239	436	498
6/29/2016	Wed			50.8	49.2	5754	5564	11318	2203	2111	4314	448	282	3551	3453	7004	466	424
6/30/2016	Thu			50.8	49.2	5940	5756	11696	2224	2085	4309	462	323	3716	3671	7387	445	501

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

July, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
7/1/2016	Fri			52.7	47.3	7165	6430	13595	2792	2270	5062	583	336	4373	4160	8533	561	541
7/2/2016	Sat			53.2	46.8	6944	6116	13060	2887	1751	4638	667	333	4057	4365	8422	507	499
7/3/2016	Sun			52.0	48.0	6234	5752	11986	2600	1628	4228	575	341	3634	4124	7758	492	513
7/4/2016	Mon	*		49.8	50.2	6292	6354	12646	2999	1263	4262	644	270	3293	5091	8384	585	387
7/5/2016	Tue			51.0	49.0	6004	5773	11777	2124	2126	4250	406	359	3880	3647	7527	527	469
7/6/2016	Wed			50.9	49.1	5838	5630	11468	2106	2170	4276	418	297	3732	3460	7192	456	492
7/7/2016	Thu			51.6	48.4	6083	5715	11798	2303	2097	4400	512	310	3780	3618	7398	494	512
7/8/2016	Fri			51.8	48.2	6470	6015	12485	2374	2079	4453	522	289	4096	3936	8032	519	537
7/9/2016	Sat			52.7	47.3	7456	6704	14160	3153	2105	5258	649	425	4303	4599	8902	696	411
7/10/2016	Sun			49.6	50.4	6255	6360	12615	2498	1591	4089	596	354	3757	4769	8526	584	460
7/11/2016	Mon			50.9	49.1	5729	5526	11255	2142	2022	4164	431	293	3587	3504	7091	481	467
7/12/2016	Tue			50.9	49.1	6000	5796	11796	2254	2119	4373	466	318	3746	3677	7423	487	482
7/13/2016	Wed			51.2	48.8	5952	5666	11618	2327	2207	4534	444	328	3625	3459	7084	463	450
7/14/2016	Thu			50.6	49.4	5932	5798	11730	2328	2128	4456	450	304	3604	3670	7274	436	478
7/15/2016	Fri			52.0	48.0	6385	5893	12278	2384	2201	4585	479	287	4001	3692	7693	481	473
7/16/2016	Sat			50.8	49.2	7251	7010	14261	3042	2007	5049	731	495	4209	5003	9212	666	463
7/17/2016	Sun			50.7	49.3	6450	6273	12723	2782	1733	4515	624	423	3668	4540	8208	617	459
7/18/2016	Mon			50.7	49.3	5493	5338	10831	2137	2132	4269	458	334	3356	3206	6562	389	450
7/19/2016	Tue			51.3	48.7	5977	5665	11642	2310	2081	4391	451	327	3667	3584	7251	438	491
7/20/2016	Wed			51.2	48.8	5934	5651	11585	2286	2133	4419	479	277	3648	3518	7166	420	428
7/21/2016	Thu			51.6	48.4	6206	5828	12034	2389	2143	4532	487	355	3817	3685	7502	522	529
7/22/2016	Fri			51.3	48.7	6354	6043	12397	2284	2257	4541	489	386	4070	3786	7856	470	511
7/23/2016	Sat		3	52.0	48.0	5809	5365	11174	2472	1872	4344	485	393	3337	3493	6830	530	407
7/24/2016	Sun		3	49.9	50.1	3729	3750	7479	1268	1234	2502	284	310	2461	2516	4977	309	325
7/25/2016	Mon			51.1	48.9	5370	5143	10513	1856	1962	3818	395	271	3514	3181	6695	452	476
7/26/2016	Tue			51.0	49.0	5930	5688	11618	2257	2103	4360	474	308	3673	3585	7258	450	501
7/27/2016	Wed			50.8	49.2	5881	5700	11581	2207	2213	4420	411	354	3674	3487	7161	474	466
7/28/2016	Thu			51.2	48.8	6213	5917	12130	2330	2237	4567	454	322	3883	3680	7563	537	475
7/29/2016	Fri			51.3	48.7	6345	6016	12361	2320	2172	4492	502	301	4025	3844	7869	481	501
7/30/2016	Sat			51.2	48.8	6669	6349	13018	2726	1841	4567	645	343	3943	4508	8451	498	528
7/31/2016	Sun			50.6	49.4	5637	5514	11151	2414	1603	4017	526	396	3223	3911	7134	521	435

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

August, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
8/1/2016	Mon			49.6	50.4	5566	5657	11223	2061	2162	4223	461	272	3505	3495	7000	504	446
8/2/2016	Tue			50.6	49.4	5799	5669	11468	2108	2139	4247	409	289	3691	3530	7221	449	469
8/3/2016	Wed			50.6	49.4	5786	5654	11440	2105	2174	4279	400	298	3681	3480	7161	482	488
8/4/2016	Thu			51.0	49.0	6029	5788	11817	2297	2247	4544	482	313	3732	3541	7273	472	493
8/5/2016	Fri			51.7	48.3	6202	5802	12004	2283	2233	4516	463	329	3919	3569	7488	517	450
8/6/2016	Sat			51.1	48.9	6541	6247	12788	2664	1948	4612	550	429	3877	4299	8176	603	457
8/7/2016	Sun			49.3	50.7	4425	4551	8976	1395	1479	2874	300	335	3030	3072	6102	377	411
8/8/2016	Mon			50.3	49.7	5657	5583	11240	2057	2071	4128	441	261	3600	3512	7112	472	498
8/9/2016	Tue			50.4	49.6	5884	5780	11664	2327	2202	4529	487	299	3557	3578	7135	458	489
8/10/2016	Wed			51.0	49.0	6026	5781	11807	2362	2168	4530	451	275	3664	3613	7277	453	514
8/11/2016	Thu			51.3	48.7	6111	5791	11902	2347	2230	4577	495	326	3764	3561	7325	507	504
8/12/2016	Fri			51.7	48.3	6546	6123	12669	2394	2301	4695	485	302	4152	3822	7974	397	626
8/13/2016	Sat			50.5	49.5	6636	6515	13151	2729	1900	4629	573	377	3907	4615	8522	493	520
8/14/2016	Sun			50.7	49.3	6072	5900	11972	2696	1659	4355	666	386	3376	4241	7617	484	503
8/15/2016	Mon			50.0	50.0	5450	5445	10895	1992	2143	4135	444	261	3458	3302	6760	443	515
8/16/2016	Tue			50.6	49.4	5816	5688	11504	2263	2227	4490	454	284	3553	3461	7014	483	479
8/17/2016	Wed			50.6	49.4	5761	5630	11391	2195	2266	4461	431	307	3566	3364	6930	463	433
8/18/2016	Thu			50.9	49.1	6037	5835	11872	2420	2361	4781	287	496	3617	3474	7091	406	509
8/19/2016	Fri	*		52.0	48.0	6788	6275	13063	2575	2035	4610	561	360	4213	4240	8453	459	559
8/20/2016	Sat			50.2	49.8	6886	6827	13713	2919	1884	4803	616	395	3967	4943	8910	520	530
8/21/2016	Sun			50.2	49.8	5718	5665	11383	2421	1562	3983	602	347	3297	4103	7400	611	444
8/22/2016	Mon			49.5	50.5	4871	4968	9839	1848	2137	3985	366	292	3023	2831	5854	385	452
8/23/2016	Tue		3	50.2	49.8	3806	3781	7587	1753	1722	3475	250	363	2053	2059	4112	253	314
8/24/2016	Wed			50.6	49.4	5047	4934	9981	1747	1879	3626	381	256	3300	3055	6355	432	466
8/25/2016	Thu			50.7	49.3	5713	5566	11279	2221	2192	4413	429	316	3492	3374	6866	465	481
8/26/2016	Fri			51.3	48.7	6351	6025	12376	2405	2244	4649	272	488	3946	3781	7727	577	492
8/27/2016	Sat			50.7	49.3	6571	6380	12951	2653	1812	4465	559	389	3918	4568	8486	585	479
8/28/2016	Sun			49.9	50.1	5475	5491	10966	2255	1573	3828	543	408	3220	3918	7138	425	466
8/29/2016	Mon			50.2	49.8	5279	5247	10526	1987	2101	4088	387	258	3292	3146	6438	402	488
8/30/2016	Tue			50.4	49.6	5441	5360	10801	2181	2282	4463	444	315	3260	3078	6338	423	492
8/31/2016	Wed			50.6	49.4	5162	5039	10201	2007	2156	4163	244	424	3155	2883	6038	397	399

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

September, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
9/1/2016	Thu			50.0	50.0	5250	5243	10493	2020	2108	4128	252	407	3230	3135	6365	421	455
9/2/2016	Fri			51.2	48.8	5962	5688	11650	2146	2138	4284	394	320	3816	3550	7366	540	503
9/3/2016	Sat			51.9	48.1	5410	5018	10428	1952	1517	3469	412	318	3458	3501	6959	427	477
9/4/2016	Sun			51.1	48.9	5709	5462	11171	2328	1446	3774	493	300	3381	4016	7397	583	403
9/5/2016	Mon	*		49.5	50.5	6067	6188	12255	2704	1527	4231	692	334	3363	4661	8024	533	592
9/6/2016	Tue			50.2	49.8	5241	5208	10449	1918	2108	4026	337	302	3323	3100	6423	429	471
9/7/2016	Wed			50.4	49.6	5080	5007	10087	1803	2062	3865	264	324	3277	2945	6222	441	445
9/8/2016	Thu			50.1	49.9	5403	5387	10790	2159	2181	4340	280	442	3244	3206	6450	442	494
9/9/2016	Fri			50.3	49.7	5509	5435	10944	2006	2079	4085	317	353	3503	3356	6859	417	501
9/10/2016	Sat			51.1	48.9	5915	5655	11570	2470	1728	4198	513	358	3445	3927	7372	505	427
9/11/2016	Sun			49.8	50.2	5047	5096	10143	2077	1489	3566	466	279	2970	3607	6577	415	465
9/12/2016	Mon			50.4	49.6	4895	4814	9709	1830	2081	3911	336	299	3065	2733	5798	438	449
9/13/2016	Tue			50.9	49.1	5659	5459	11118	2229	2220	4449	397	319	3430	3239	6669	496	467
9/14/2016	Wed			51.4	48.6	5233	4954	10187	1944	2197	4141	264	415	3289	2757	6046	463	421
9/15/2016	Thu			51.0	49.0	5468	5253	10721	2080	2125	4205	248	408	3388	3128	6516	487	498
9/16/2016	Fri			51.2	48.8	5996	5719	11715	2214	2297	4511	291	471	3782	3422	7204	504	492
9/17/2016	Sat			52.3	47.7	6641	6051	12692	2806	1992	4798	611	405	3835	4059	7894	549	480
9/18/2016	Sun			50.7	49.3	6203	6036	12239	2822	1682	4504	626	358	3381	4354	7735	555	496
9/19/2016	Mon			50.3	49.7	5547	5491	11038	2236	2188	4424	426	283	3311	3303	6614	450	502
9/20/2016	Tue			50.2	49.8	5565	5514	11079	2207	2123	4330	359	359	3358	3391	6749	434	483
9/21/2016	Wed			50.4	49.6	5523	5436	10959	2196	2185	4381	329	386	3327	3251	6578	441	475
9/22/2016	Thu			50.2	49.8	5646	5605	11251	2307	2230	4537	346	402	3339	3375	6714	438	490
9/23/2016	Fri			51.0	49.0	6019	5772	11791	2320	2201	4521	330	392	3699	3571	7270	473	519
9/24/2016	Sat			51.6	48.4	6478	6066	12544	2611	1825	4436	518	337	3867	4241	8108	562	476
9/25/2016	Sun			50.2	49.8	5497	5447	10944	2307	1511	3818	509	339	3190	3936	7126	385	523
9/26/2016	Mon			49.0	51.0	4853	5042	9895	1963	2084	4047	370	289	2890	2958	5848	402	450
9/27/2016	Tue			50.2	49.8	5224	5176	10400	2030	2025	4055	402	261	3194	3151	6345	412	481
9/28/2016	Wed			50.4	49.6	5472	5377	10849	2123	2150	4273	363	311	3349	3227	6576	447	517
9/29/2016	Thu			50.6	49.4	5269	5145	10414	2057	2111	4168	296	405	3212	3034	6246	382	512
9/30/2016	Fri			50.6	49.4	5570	5434	11004	2104	2187	4291	263	456	3466	3247	6713	422	470

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

October, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
10/1/2016	Sat			51.0	49.0	5774	5550	11324	2069	1626	3695	502	280	3705	3924	7629	435	498
10/2/2016	Sun			50.3	49.7	4897	4838	9735	1993	1373	3366	432	282	2904	3465	6369	437	405
10/3/2016	Mon			49.5	50.5	4873	4966	9839	1789	2018	3807	279	337	3084	2948	6032	428	470
10/4/2016	Tue			50.4	49.6	5247	5172	10419	1921	2047	3968	260	374	3326	3125	6451	463	490
10/5/2016	Wed			50.8	49.2	5250	5079	10329	1935	2029	3964	346	254	3315	3050	6365	463	423
10/6/2016	Thu			50.9	49.1	5633	5423	11056	2169	2088	4257	391	288	3464	3335	6799	502	490
10/7/2016	Fri			51.2	48.8	5783	5512	11295	2090	2019	4109	413	299	3693	3493	7186	493	514
10/8/2016	Sat			52.4	47.6	7156	6502	13658	3166	2045	5211	674	417	3990	4457	8447	578	466
10/9/2016	Sun			50.5	49.5	6050	5919	11969	2600	1604	4204	550	364	3450	4315	7765	595	407
10/10/2016	Mon			50.7	49.3	6339	6161	12500	2810	2103	4913	592	405	3529	4058	7587	540	509
10/11/2016	Tue			51.5	48.5	6066	5719	11785	2486	2203	4689	512	358	3580	3516	7096	458	531
10/12/2016	Wed			50.9	49.1	5859	5649	11508	2338	2199	4537	426	307	3521	3450	6971	464	494
10/13/2016	Thu			50.8	49.2	6015	5831	11846	2456	2275	4731	453	341	3559	3556	7115	477	508
10/14/2016	Fri			51.4	48.6	6324	5991	12315	2480	2247	4727	477	369	3844	3744	7588	507	519
10/15/2016	Sat			52.4	47.6	7022	6390	13412	2861	2029	4890	526	418	4161	4361	8522	553	496
10/16/2016	Sun			49.8	50.2	5783	5837	11620	2569	1682	4251	497	354	3214	4155	7369	454	497
10/17/2016	Mon			50.0	50.0	5369	5369	10738	2167	2097	4264	394	301	3202	3272	6474	430	502
10/18/2016	Tue			50.3	49.7	5394	5330	10724	2144	2165	4309	382	294	3250	3165	6415	453	511
10/19/2016	Wed			50.6	49.4	5317	5185	10502	2152	2254	4406	274	448	3165	2931	6096	396	455
10/20/2016	Thu			50.9	49.1	5861	5655	11516	2344	2238	4582	422	314	3517	3417	6934	525	545
10/21/2016	Fri			52.0	48.0	6171	5707	11878	2492	2280	4772	385	388	3679	3427	7106	485	468
10/22/2016	Sat			51.6	48.4	6252	5857	12109	2599	1848	4447	510	335	3653	4009	7662	533	506
10/23/2016	Sun			50.1	49.9	5552	5525	11077	2523	1586	4109	491	351	3029	3939	6968	497	470
10/24/2016	Mon			50.0	50.0	5256	5255	10511	2045	2154	4199	329	347	3211	3101	6312	464	469
10/25/2016	Tue			50.7	49.3	5846	5689	11535	2418	2177	4595	448	305	3428	3512	6940	488	493
10/26/2016	Wed			51.4	48.6	5505	5202	10707	2221	2190	4411	382	308	3284	3012	6296	437	486
10/27/2016	Thu			51.2	48.8	5551	5293	10844	2334	2170	4504	409	321	3217	3123	6340	416	536
10/28/2016	Fri			51.0	49.0	5496	5277	10773	2027	2095	4122	396	283	3469	3182	6651	421	500
10/29/2016	Sat			51.7	48.3	5982	5591	11573	2276	1832	4108	503	332	3706	3759	7465	458	506
10/30/2016	Sun			50.8	49.2	5217	5045	10262	2232	1523	3755	470	304	2985	3522	6507	435	401
10/31/2016	Mon			49.9	50.1	5112	5123	10235	1972	2052	4024	269	363	3140	3071	6211	438	458

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

November, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
11/1/2016	Tue			51.0	49.0	5377	5161	10538	2025	2020	4045	347	318	3352	3141	6493	491	468
11/2/2016	Wed			51.5	48.5	5628	5305	10933	2241	2134	4375	438	290	3387	3171	6558	450	463
11/3/2016	Thu			50.9	49.1	5735	5530	11265	2340	2127	4467	439	309	3395	3403	6798	468	492
11/4/2016	Fri			51.4	48.6	5992	5665	11657	2314	2172	4486	327	405	3678	3493	7171	447	499
11/5/2016	Sat			51.2	48.8	6383	6077	12460	2494	1908	4402	531	388	3889	4169	8058	565	459
11/6/2016	Sun			50.0	50.0	5871	5871	11742	2602	1842	4444	461	395	3269	4029	7298	441	533
11/7/2016	Mon			51.5	48.5	5488	5171	10659	2113	2178	4291	413	347	3375	2993	6368	457	395
11/8/2016	Tue	*		51.4	48.6	5763	5458	11221	2343	2032	4375	494	351	3420	3426	6846	412	526
11/9/2016	Wed			50.5	49.5	5479	5369	10848	2040	2160	4200	384	282	3439	3209	6648	468	467
11/10/2016	Thu			52.1	47.9	6106	5623	11729	2461	2263	4724	342	498	3645	3360	7005	471	543
11/11/2016	Fri	*		52.4	47.6	6805	6178	12983	2675	1885	4560	590	376	4130	4293	8423	605	461
11/12/2016	Sat			50.9	49.1	6769	6524	13293	2898	1906	4804	572	382	3871	4618	8489	484	603
11/13/2016	Sun			50.1	49.9	5863	5833	11696	2560	1777	4337	518	389	3303	4056	7359	504	478
11/14/2016	Mon			50.9	49.1	5591	5383	10974	2080	2051	4131	394	304	3511	3332	6843	480	492
11/15/2016	Tue			50.7	49.3	5355	5200	10555	2025	2176	4201	393	278	3330	3024	6354	439	499
11/16/2016	Wed			49.9	50.1	5544	5558	11102	2085	2275	4360	284	411	3459	3283	6742	488	504
11/17/2016	Thu			51.4	48.6	5856	5534	11390	2452	2398	4850	348	483	3404	3136	6540	436	495
11/18/2016	Fri			52.0	48.0	6113	5653	11766	2310	2233	4543	448	309	3803	3420	7223	485	496
11/19/2016	Sat			54.1	45.9	6974	5910	12884	2300	1951	4251	459	378	4674	3959	8633	814	204
11/20/2016	Sun			51.4	48.6	5703	5400	11103	2471	1587	4058	479	342	3232	3813	7045	454	494
11/21/2016	Mon			50.8	49.2	5233	5063	10296	1922	2189	4111	368	335	3311	2874	6185	435	445
11/22/2016	Tue			50.3	49.7	5627	5557	11184	2110	2234	4344	429	314	3517	3323	6840	476	540
11/23/2016	Wed			51.1	48.9	5811	5553	11364	2153	2236	4389	398	318	3658	3317	6975	451	510
11/24/2016	Thu	*		50.2	49.8	4534	4489	9023	1895	1323	3218	400	315	2639	3166	5805	405	345
11/25/2016	Fri		3	51.4	48.6	5460	5161	10621	2240	1769	4009	500	365	3220	3392	6612	448	485
11/26/2016	Sat			51.6	48.4	6223	5840	12063	2472	1751	4223	556	392	3751	4089	7840	508	484
11/27/2016	Sun			49.3	50.7	4969	5102	10071	2081	1552	3633	407	337	2888	3550	6438	418	458
11/28/2016	Mon			50.3	49.7	5263	5200	10463	1919	2144	4063	339	319	3344	3056	6400	449	492
11/29/2016	Tue			50.2	49.8	5131	5090	10221	2036	2111	4147	369	291	3095	2979	6074	443	468
11/30/2016	Wed			48.9	51.1	5264	5508	10772	2077	2674	4751	314	547	3187	2834	6021	449	408

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

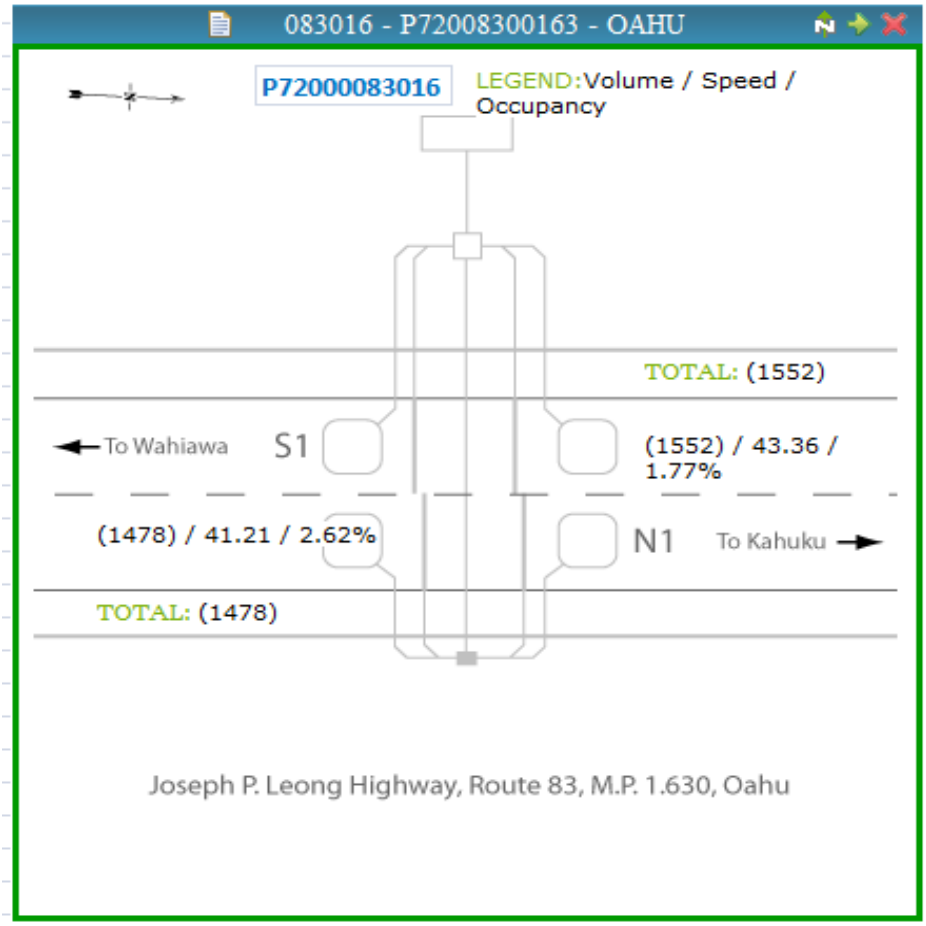
December, 2016

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
12/1/2016	Thu			50.7	49.3	5201	5049	10250	1884	2134	4018	239	386	3317	2915	6232	457	460
12/2/2016	Fri			52.1	47.9	6071	5585	11656	2242	2060	4302	406	316	3829	3525	7354	515	494
12/3/2016	Sat			52.0	48.0	6252	5773	12025	2645	1907	4552	560	391	3607	3866	7473	578	425
12/4/2016	Sun			51.5	48.5	4827	4541	9368	2256	1509	3765	420	332	2571	3032	5603	395	373
12/5/2016	Mon			50.9	49.1	5616	5410	11026	2143	2179	4322	390	304	3473	3231	6704	482	484
12/6/2016	Tue			50.9	49.1	5842	5635	11477	2211	2229	4440	388	317	3631	3406	7037	500	528
12/7/2016	Wed			50.9	49.1	5829	5632	11461	2271	2310	4581	418	338	3558	3322	6880	493	461
12/8/2016	Thu			50.9	49.1	5603	5401	11004	2315	2332	4647	377	358	3288	3069	6357	444	492
12/9/2016	Fri			51.1	48.9	6332	6055	12387	2151	2214	4365	414	303	4181	3841	8022	549	546
12/10/2016	Sat			51.3	48.7	6212	5895	12107	2486	1885	4371	505	368	3726	4010	7736	445	532
12/11/2016	Sun			51.6	48.4	5713	5368	11081	2433	1616	4049	498	337	3280	3752	7032	392	515
12/12/2016	Mon			51.6	48.4	5945	5572	11517	2414	2095	4509	424	276	3531	3477	7008	453	497
12/13/2016	Tue			50.8	49.2	6019	5820	11839	2331	2275	4606	443	304	3688	3545	7233	519	481
12/14/2016	Wed			51.2	48.8	5978	5709	11687	2345	2155	4500	426	309	3633	3554	7187	440	535
12/15/2016	Thu			50.2	49.8	5608	5572	11180	2080	2346	4426	314	414	3528	3226	6754	436	529
12/16/2016	Fri			50.9	49.1	5924	5717	11641	2242	2186	4428	429	321	3682	3531	7213	457	534
12/17/2016	Sat			51.5	48.5	5867	5515	11382	2203	1580	3783	442	298	3664	3935	7599	423	514
12/18/2016	Sun			51.5	48.5	5838	5505	11343	2748	1452	4200	553	325	3090	4053	7143	462	459
12/19/2016	Mon			51.3	48.7	6586	6259	12845	2800	2223	5023	506	349	3786	4036	7822	518	526
12/20/2016	Tue			50.7	49.3	6465	6299	12764	2573	2347	4920	523	413	3892	3952	7844	511	526
12/21/2016	Wed			50.1	49.9	6258	6229	12487	2273	2204	4477	447	358	3985	4025	8010	431	753
12/22/2016	Thu			50.7	49.3	6349	6173	12522	2354	2175	4529	476	376	3995	3998	7993	548	473
12/23/2016	Fri			51.8	48.2	6739	6267	13006	2677	2119	4796	594	447	4062	4148	8210	529	539
12/24/2016	Sat			51.1	48.9	5296	5064	10360	2114	1673	3787	437	352	3182	3391	6573	453	381
12/25/2016	Sun			51.0	49.0	4758	4563	9321	1702	989	2691	473	261	3056	3574	6630	467	404
12/26/2016	Mon	*		51.0	49.0	6027	5800	11827	2194	1516	3710	586	356	3833	4284	8117	534	537
12/27/2016	Tue			51.4	48.6	6311	5970	12281	2579	1999	4578	636	339	3732	3971	7703	503	502
12/28/2016	Wed			51.5	48.5	6380	6001	12381	2506	2056	4562	553	364	3874	3945	7819	518	501
12/29/2016	Thu			51.7	48.3	6411	5986	12397	2498	2038	4536	615	374	3913	3948	7861	498	543
12/30/2016	Fri			52.2	47.8	6125	5606	11731	2194	2002	4196	510	391	3931	3604	7535	565	410
12/31/2016	Sat			51.4	48.6	5582	5287	10869	2427	1655	4082	576	383	3155	3632	6787	390	537

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR


083016 - P72008300163 - OAHU
P72000083016
LEGEND:Volume / Speed / Occupancy
TOTAL: (1552)
To Wahiawa
S1
(1552) / 43.36 / 1.77%
(1478) / 41.21 / 2.62%
N1
To Kahuku
TOTAL: (1478)
Joseph P. Leong Highway, Route 83, M.P. 1.630, Oahu

STATION: 083016
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2017 - 2017
LOC'N 21.598398 -158.099586

Oahu
DIRECTION 01 (D1): Northbound, MOV 1
DIRECTION 02 (D2): Southbound, MOV 5

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	10588	10967	11397	11720	12313	11788	10820	11397	11370	1.01674	1.01437
February	10563	11009	10623	11550	12338	12775	11733	11216	11513	1.00415	1.03069
March	11397	11659	11522	11491	12108	13055	12161	11635	11913	0.97042	0.99359
April	10871	11419	11559	11443	11797	12613	11348	11418	11579	0.99845	1.01251
May	11398	11446	11380	11902	12142	13282	12446	11654	11999	0.96343	0.99203
June	11427	11456	11517	11824	12199	13290	12042	11685	11965	0.96622	0.98940
July	11431	11660	11642	12111	12579	13823	12748	11884	12285	0.94105	0.97276
August	10850	11049	11116	11627	12182	12960	12101	11365	11698	0.98828	1.01724
September	10029	10553	10836	11308	11736	12365	11149	10892	11139	1.03783	1.06139
October	10727	10740	10546	11025	11748	11996	10908	10957	11099	1.04163	1.05508
November	10277	10783	10605	11075	11485	11526	10331	10845	10869	1.06367	1.06601
December	11181	10624	11231	11653	11826	11914	10670	11303	11300	1.02308	1.02280
AVERAGE	10895	11114	11164	11561	12038	12616	11538	AVERAGE 11354	D1+D2 AADT 11561		

K-FACTOR 9.38%
K-FACTOR PERIOD PM
D-FACTOR 52.49%

STATION: 083016
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2017 - 2017
LOC'N 21.598398 -158.099586

Oahu

DIRECTION 01 (D1): Northbound, MOV 1

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	5310	5537	5778	5929	6289	6060	5402	5768	5758	1.01851	1.01661
February	5339	5555	5383	5843	6326	6624	5905	5689	5853	1.00185	1.03080
March	5773	5936	5834	5819	6211	6700	6160	5914	6062	0.96742	0.99151
April	5457	5789	5838	5807	6065	6477	5722	5791	5879	0.99747	1.01266
May	5698	5736	5778	6070	6252	6789	6266	5907	6084	0.96385	0.99279
June	5773	5777	5867	6020	6269	6827	6069	5941	6086	0.96356	0.98703
July	5802	5946	5884	6114	6490	7115	6446	6047	6257	0.93728	0.96975
August	5454	5577	5612	5895	6208	6696	6089	5749	5933	0.98841	1.02002
September	5019	5247	5471	5732	6026	6344	5550	5499	5627	1.04219	1.06644
October	5387	5417	5322	5573	5942	6161	5515	5528	5616	1.04409	1.06081
November	5110	5405	5338	5615	5924	5871	5157	5478	5488	1.06847	1.07046
December	5707	5305	5660	5870	6022	6130	5395	5713	5727	1.02396	1.02652
AVERAGE	5486	5602	5647	5857	6168	6483	5806	AVERAGE 5752	D1 AADT 5864		

STATION: 083016
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2017 - 2017
LOC'N 21.598398 -158.099586
Oahu
DIRECTION 02 (D2): Southbound, MOV 5

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	5278	5431	5620	5791	6024	5728	5418	5629	5613	1.01493	1.01206
February	5224	5454	5241	5707	6012	6151	5828	5528	5660	1.00654	1.03057
March	5624	5723	5688	5672	5897	6355	6001	5721	5851	0.97352	0.99575
April	5415	5631	5721	5636	5732	6136	5626	5627	5700	0.99947	1.01236
May	5699	5710	5602	5832	5890	6494	6180	5747	5915	0.96301	0.99125
June	5654	5680	5650	5804	5930	6463	5973	5743	5879	0.96898	0.99185
July	5629	5714	5758	5997	6090	6708	6303	5837	6028	0.94497	0.97588
August	5396	5472	5504	5733	5974	6264	6012	5616	5765	0.98816	1.01439
September	5010	5305	5365	5576	5710	6022	5600	5393	5513	1.03338	1.05624
October	5340	5323	5224	5452	5807	5836	5393	5429	5482	1.03911	1.04925
November	5167	5378	5267	5460	5561	5655	5174	5367	5380	1.05878	1.06147
December	5474	5319	5571	5784	5804	5784	5275	5590	5573	1.02218	1.01900
AVERAGE	5409	5512	5518	5704	5869	6133	5732	AVERAGE 5602	D2 AADT 5697		

January, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
1/1/2017	Sun			50.2	49.8	5484	5447	10931	1985	1207	3192	553	292	3499	4240	7739	516	537
1/2/2017	Mon	*		51.1	48.9	6466	6198	12664	2949	1653	4602	727	403	3517	4545	8062	527	534
1/3/2017	Tue			50.9	49.1	5965	5745	11710	2275	1997	4272	552	305	3690	3748	7438	468	579
1/4/2017	Wed			50.2	49.8	5834	5780	11614	2251	2103	4354	462	372	3583	3677	7260	488	494
1/5/2017	Thu			50.1	49.9	5753	5733	11486	2254	2167	4421	445	360	3499	3566	7065	451	540
1/6/2017	Fri			50.6	49.4	6103	5952	12055	2278	2088	4366	492	331	3825	3864	7689	508	543
1/7/2017	Sat			51.0	49.0	6171	5918	12089	2455	1817	4272	601	357	3716	4101	7817	526	485
1/8/2017	Sun			49.9	50.1	5790	5814	11604	2487	1482	3969	550	310	3303	4332	7635	595	404
1/9/2017	Mon			50.7	49.3	5410	5260	10670	2112	2102	4214	415	293	3298	3158	6456	437	434
1/10/2017	Tue			50.6	49.4	5648	5518	11166	2176	2123	4299	463	318	3472	3395	6867	499	516
1/11/2017	Wed			50.6	49.4	5782	5639	11421	2302	2275	4577	414	353	3480	3364	6844	500	482
1/12/2017	Thu			50.4	49.6	5967	5861	11828	2455	2183	4638	473	287	3512	3678	7190	454	548
1/13/2017	Fri			51.1	48.9	6482	6196	12678	2546	2182	4728	520	359	3936	4014	7950	510	538
1/14/2017	Sat			52.0	48.0	6385	5905	12290	2731	1769	4500	586	345	3654	4136	7790	591	371
1/15/2017	Sun			50.2	49.8	5954	5903	11857	2587	1623	4210	546	361	3367	4280	7647	563	433
1/16/2017	Mon	*		50.4	49.6	6613	6504	13117	3027	1956	4983	696	422	3586	4548	8134	541	542
1/17/2017	Tue			50.3	49.7	5719	5643	11362	2181	2196	4377	405	315	3538	3447	6985	465	511
1/18/2017	Wed			51.0	49.0	5956	5721	11677	2383	2215	4598	306	444	3573	3506	7079	471	474
1/19/2017	Thu			51.2	48.8	5970	5682	11652	2380	2176	4556	419	317	3590	3506	7096	497	514
1/20/2017	Fri			51.3	48.7	6183	5874	12057	2434	2327	4761	325	443	3749	3547	7296	474	512
1/21/2017	Sat			51.0	49.0	5143	4947	10090	1904	1787	3691	402	349	3239	3160	6399	414	479
1/22/2017	Sun			50.2	49.8	4503	4461	8964	1714	1257	2971	385	282	2789	3204	5993	366	411
1/23/2017	Mon			49.8	50.2	5459	5509	10968	2035	2118	4153	416	308	3424	3391	6815	506	450
1/24/2017	Tue			50.5	49.5	5328	5221	10549	2038	2138	4176	405	293	3290	3083	6373	415	453
1/25/2017	Wed			50.9	49.1	5538	5338	10876	2122	2139	4261	372	331	3416	3199	6615	457	469
1/26/2017	Thu			50.6	49.4	6026	5888	11914	2383	2234	4617	305	485	3643	3654	7297	463	526
1/27/2017	Fri			51.3	48.7	6387	6074	12461	2667	2275	4942	384	456	3720	3799	7519	510	494
1/28/2017	Sat			51.6	48.4	6540	6142	12682	2757	1729	4486	594	384	3783	4413	8196	615	419
1/29/2017	Sun			49.1	50.9	5278	5464	10742	2089	1518	3607	505	346	3189	3946	7135	514	432
1/30/2017	Mon			50.0	50.0	5060	5065	10125	1897	2114	4011	395	322	3163	2951	6114	386	505
1/31/2017	Tue			50.0	50.0	5023	5027	10050	1839	2053	3892	378	268	3184	2974	6158	430	495

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

February, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1

DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
2/1/2017	Wed			50.2	49.8	5248	5204	10452	1895	2129	4024	372	294	3353	3075	6428	425	448
2/2/2017	Thu			50.2	49.8	5569	5520	11089	2171	2073	4244	388	304	3398	3447	6845	418	461
2/3/2017	Fri			51.7	48.3	6029	5630	11659	2375	2098	4473	428	305	3654	3532	7186	517	477
2/4/2017	Sat			52.4	47.6	6394	5815	12209	2788	1798	4586	563	326	3606	4017	7623	464	514
2/5/2017	Sun		3	50.6	49.4	4511	4405	8916	2025	1493	3518	397	328	2486	2912	5398	463	361
2/6/2017	Mon			50.5	49.5	4484	4400	8884	1617	2081	3698	293	314	2867	2319	5186	340	320
2/7/2017	Tue			50.8	49.2	5370	5209	10579	1939	2109	4048	391	288	3431	3100	6531	429	501
2/8/2017	Wed			50.3	49.7	5250	5195	10445	1895	2136	4031	382	299	3355	3059	6414	445	490
2/9/2017	Thu			51.5	48.5	5853	5517	11370	2357	2061	4418	494	309	3496	3456	6952	454	515
2/10/2017	Fri			50.8	49.2	6013	5833	11846	2210	2231	4441	412	341	3803	3602	7405	509	456
2/11/2017	Sat		3	50.6	49.4	4123	4032	8155	1328	1573	2901	251	324	2795	2459	5254	372	312
2/12/2017	Sun			50.3	49.7	5473	5401	10874	2016	1451	3467	546	300	3457	3950	7407	404	554
2/13/2017	Mon			50.5	49.5	5636	5524	11160	2095	2001	4096	481	303	3541	3523	7064	439	514
2/14/2017	Tue			50.4	49.6	5646	5552	11198	2093	2050	4143	434	327	3553	3502	7055	429	464
2/15/2017	Wed			51.1	48.9	5207	4977	10184	2066	2144	4210	267	409	3141	2833	5974	367	502
2/16/2017	Thu			50.2	49.8	5813	5772	11585	2301	2179	4480	289	438	3512	3593	7105	463	491
2/17/2017	Fri			51.3	48.7	6799	6451	13250	2813	2234	5047	554	371	3986	4217	8203	521	535
2/18/2017	Sat			51.2	48.8	6763	6444	13207	2971	1989	4960	544	430	3792	4455	8247	592	478
2/19/2017	Sun			51.3	48.7	5815	5524	11339	2203	1490	3693	554	344	3612	4034	7646	553	496
2/20/2017	Mon	*		50.7	49.3	6227	6053	12280	2525	1857	4382	667	389	3702	4196	7898	597	427
2/21/2017	Tue			49.9	50.1	5675	5692	11367	2070	2225	4295	465	337	3605	3467	7072	494	574
2/22/2017	Wed			51.0	49.0	5825	5586	11411	2105	2160	4265	430	310	3720	3426	7146	483	513
2/23/2017	Thu			50.5	49.5	6138	6019	12157	2426	2298	4724	510	334	3712	3721	7433	495	483
2/24/2017	Fri			51.3	48.7	6462	6135	12597	2427	2237	4664	457	307	4035	3898	7933	500	483
2/25/2017	Sat			52.0	48.0	6715	6194	12909	2898	1789	4687	615	344	3817	4405	8222	551	459
2/26/2017	Sun			49.5	50.5	6426	6559	12985	2870	1775	4645	624	403	3556	4784	8340	508	565
2/27/2017	Mon			50.6	49.4	5896	5748	11644	2356	2234	4590	473	321	3540	3514	7054	490	510
2/28/2017	Tue			50.8	49.2	5527	5363	10890	2094	2258	4352	387	372	3433	3105	6538	483	488

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

March, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
3/1/2017	Wed		3	50.4	49.6	4056	3987	8043	1307	1806	3113	205	315	2749	2181	4930	359	302
3/2/2017	Thu			50.4	49.6	5338	5260	10598	1969	2140	4109	366	333	3369	3120	6489	412	505
3/3/2017	Fri			50.6	49.4	6176	6040	12216	2326	2246	4572	423	351	3850	3794	7644	472	529
3/4/2017	Sat			52.1	47.9	6338	5823	12161	2781	1901	4682	484	329	3557	3922	7479	411	514
3/5/2017	Sun			51.7	48.3	6031	5642	11673	2498	1682	4180	524	389	3533	3960	7493	529	526
3/6/2017	Mon			50.7	49.3	5647	5492	11139	2123	2222	4345	441	303	3524	3270	6794	477	469
3/7/2017	Tue			50.5	49.5	5559	5453	11012	2142	2272	4414	414	346	3417	3181	6598	444	469
3/8/2017	Wed			50.7	49.3	5613	5459	11072	2125	2416	4541	268	433	3488	3043	6531	468	543
3/9/2017	Thu			50.9	49.1	5476	5282	10758	2100	2260	4360	390	315	3376	3022	6398	414	526
3/10/2017	Fri			51.1	48.9	6125	5850	11975	2304	2259	4563	416	341	3821	3591	7412	500	504
3/11/2017	Sat			51.1	48.9	6725	6445	13170	2701	1971	4672	507	395	4024	4474	8498	568	533
3/12/2017	Sun			50.3	49.7	5826	5753	11579	2431	1559	3990	574	331	3395	4194	7589	545	387
3/13/2017	Mon			50.4	49.6	5667	5581	11248	2286	2194	4480	477	297	3381	3387	6768	428	497
3/14/2017	Tue			51.5	48.5	6009	5666	11675	2429	2315	4744	425	351	3580	3351	6931	478	475
3/15/2017	Wed			50.7	49.3	5838	5669	11507	2378	2349	4727	430	326	3460	3320	6780	475	581
3/16/2017	Thu			50.5	49.5	5749	5639	11388	2264	2252	4516	444	322	3485	3387	6872	513	529
3/17/2017	Fri			51.5	48.5	6018	5663	11681	2256	2237	4493	447	308	3762	3426	7188	491	456
3/18/2017	Sat			51.3	48.7	6874	6519	13393	2795	1860	4655	599	373	4079	4659	8738	548	571
3/19/2017	Sun			50.0	50.0	6461	6466	12927	2926	1741	4667	626	356	3535	4725	8260	590	486
3/20/2017	Mon			50.9	49.1	6004	5800	11804	2328	2210	4538	466	353	3676	3590	7266	464	502
3/21/2017	Tue			51.3	48.7	6399	6081	12480	2617	2257	4874	529	394	3782	3824	7606	514	520
3/22/2017	Wed			50.7	49.3	6287	6114	12401	2570	2285	4855	524	312	3717	3829	7546	504	554
3/23/2017	Thu			51.1	48.9	6591	6312	12903	2763	2308	5071	566	330	3828	4004	7832	463	554
3/24/2017	Fri			51.3	48.7	6472	6142	12614	2688	2355	5043	487	397	3784	3787	7571	464	477
3/25/2017	Sat			50.9	49.1	6862	6632	13494	2867	1888	4755	627	327	3995	4744	8739	524	550
3/26/2017	Sun			50.7	49.3	6322	6144	12466	2780	1699	4479	675	371	3542	4445	7987	529	501
3/27/2017	Mon	*		50.6	49.4	6074	5924	11998	2410	2131	4541	489	402	3664	3793	7457	447	514
3/28/2017	Tue			50.4	49.6	5776	5692	11468	2233	2226	4459	453	288	3543	3466	7009	488	468
3/29/2017	Wed			50.4	49.6	5596	5511	11107	2253	2293	4546	423	327	3343	3218	6561	486	474
3/30/2017	Thu			50.3	49.7	5940	5868	11808	2440	2369	4809	446	344	3500	3499	6999	468	462
3/31/2017	Fri			52.0	48.0	6264	5788	12052	2439	2267	4706	481	305	3825	3521	7346	467	458

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

April, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
4/1/2017	Sat			51.3	48.7	6048	5741	11789	2311	1781	4092	472	330	3737	3960	7697	541	480
4/2/2017	Sun			50.9	49.1	5753	5547	11300	2486	1560	4046	529	337	3267	3987	7254	543	430
4/3/2017	Mon			50.5	49.5	5443	5339	10782	2103	2138	4241	393	298	3340	3201	6541	431	470
4/4/2017	Tue			50.7	49.3	5762	5609	11371	2320	2251	4571	483	316	3442	3358	6800	475	472
4/5/2017	Wed			50.6	49.4	5777	5643	11420	2287	2269	4556	363	361	3490	3374	6864	461	460
4/6/2017	Thu			50.5	49.5	5828	5704	11532	2305	2377	4682	423	338	3523	3327	6850	497	458
4/7/2017	Fri			51.0	49.0	6371	6116	12487	2603	2364	4967	504	328	3768	3752	7520	463	528
4/8/2017	Sat			51.4	48.6	6842	6474	13316	2968	2000	4968	635	429	3874	4474	8348	612	524
4/9/2017	Sun			50.4	49.6	5651	5558	11209	2457	1624	4081	524	330	3194	3934	7128	494	422
4/10/2017	Mon			49.9	50.1	5482	5496	10978	2087	2241	4328	380	300	3395	3255	6650	467	446
4/11/2017	Tue			50.7	49.3	5864	5699	11563	2366	2229	4595	465	292	3498	3470	6968	495	458
4/12/2017	Wed			50.6	49.4	6080	5945	12025	2424	2368	4792	381	389	3656	3577	7233	495	485
4/13/2017	Thu			51.2	48.8	6452	6142	12594	2716	2496	5212	372	450	3736	3646	7382	479	486
4/14/2017	Fri	*		51.8	48.2	6646	6194	12840	2830	2126	4956	540	380	3816	4068	7884	527	480
4/15/2017	Sat			51.5	48.5	7184	6769	13953	3279	2051	5330	599	452	3905	4718	8623	563	513
4/16/2017	Sun	*		50.4	49.6	5486	5395	10881	2565	1601	4166	520	405	2921	3794	6715	541	438
4/17/2017	Mon			50.2	49.8	5488	5436	10924	2205	2249	4454	385	328	3283	3187	6470	469	426
4/18/2017	Tue			50.3	49.7	5907	5846	11753	2430	2328	4758	457	315	3477	3518	6995	498	476
4/19/2017	Wed			50.5	49.5	5624	5521	11145	2269	2269	4538	408	314	3355	3252	6607	422	481
4/20/2017	Thu			50.7	49.3	5096	4951	10047	2056	2249	4305	340	357	3040	2702	5742	395	430
4/21/2017	Fri			52.3	47.7	5900	5371	11271	2428	2326	4754	306	452	3472	3045	6517	454	435
4/22/2017	Sat			51.2	48.8	5834	5560	11394	2151	1797	3948	511	315	3683	3763	7446	527	486
4/23/2017	Sun			50.0	50.0	5762	5773	11535	2362	1540	3902	556	327	3400	4233	7633	490	480
4/24/2017	Mon			50.1	49.9	5413	5388	10801	2152	2125	4277	409	268	3261	3263	6524	430	477
4/25/2017	Tue			51.1	48.9	5621	5369	10990	2250	2149	4399	393	300	3371	3220	6591	436	503
4/26/2017	Wed			50.4	49.6	5869	5775	11644	2340	2302	4642	447	321	3529	3473	7002	488	458
4/27/2017	Thu			50.5	49.5	5852	5747	11599	2467	2293	4760	454	303	3385	3454	6839	460	472
4/28/2017	Fri			50.9	49.1	5923	5710	11633	2382	2333	4715	476	306	3541	3377	6918	436	452
4/29/2017	Sat		3	51.5	48.5	5440	5117	10557	1939	1702	3641	463	319	3501	3415	6916	452	464
4/30/2017	Sun		3	48.5	51.5	4023	4278	8301	1394	1391	2785	250	312	2629	2887	5516	349	388

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

May, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
5/1/2017	Mon			50.6	49.4	5584	5454	11038	2188	2206	4394	346	360	3396	3248	6644	449	454
5/2/2017	Tue			50.0	50.0	5684	5674	11358	2205	2209	4414	460	285	3479	3465	6944	426	510
5/3/2017	Wed			50.7	49.3	5648	5501	11149	2148	2118	4266	299	401	3500	3383	6883	446	511
5/4/2017	Thu			50.2	49.8	5831	5787	11618	2360	2429	4789	282	489	3471	3358	6829	448	487
5/5/2017	Fri			51.2	48.8	6323	6035	12358	2512	2293	4805	320	456	3811	3742	7553	480	458
5/6/2017	Sat			50.4	49.6	6544	6452	12996	2689	1863	4552	596	347	3855	4589	8444	517	549
5/7/2017	Sun			50.1	49.9	6153	6119	12272	2604	1592	4196	597	339	3549	4527	8076	536	477
5/8/2017	Mon			48.5	51.5	5585	5930	11515	2284	2602	4886	439	341	3301	3328	6629	414	509
5/9/2017	Tue			50.5	49.5	5858	5745	11603	2477	2309	4786	446	371	3381	3436	6817	462	544
5/10/2017	Wed			50.5	49.5	5722	5606	11328	2224	2235	4459	324	380	3498	3371	6869	471	463
5/11/2017	Thu			51.3	48.7	6000	5686	11686	2339	2257	4596	294	454	3661	3429	7090	523	468
5/12/2017	Fri			51.2	48.8	6152	5873	12025	2242	2220	4462	437	367	3910	3653	7563	487	448
5/13/2017	Sat			50.9	49.1	6795	6562	13357	2858	1959	4817	597	387	3937	4603	8540	530	515
5/14/2017	Sun			50.6	49.4	6216	6068	12284	2588	1544	4132	629	324	3628	4524	8152	664	417
5/15/2017	Mon			50.7	49.3	5676	5514	11190	2169	2127	4296	473	264	3507	3387	6894	457	471
5/16/2017	Tue			49.8	50.2	5610	5646	11256	2083	2159	4242	430	265	3527	3487	7014	477	438
5/17/2017	Wed			50.5	49.5	5588	5469	11057	2029	2101	4130	351	297	3559	3368	6927	435	466
5/18/2017	Thu			51.7	48.3	6453	6025	12478	2568	2318	4886	477	320	3885	3707	7592	561	486
5/19/2017	Fri			51.4	48.6	6022	5695	11717	2397	2237	4634	459	327	3625	3458	7083	408	513
5/20/2017	Sat			51.3	48.7	6941	6585	13526	2893	1966	4859	635	387	4048	4619	8667	538	530
5/21/2017	Sun			50.2	49.8	6125	6074	12199	2564	1654	4218	569	364	3561	4420	7981	529	486
5/22/2017	Mon			50.2	49.8	5948	5899	11847	2400	2337	4737	449	381	3548	3562	7110	458	500
5/23/2017	Tue			50.3	49.7	5730	5671	11401	2198	2203	4401	464	292	3532	3468	7000	476	465
5/24/2017	Wed			51.0	49.0	5715	5501	11216	2148	2266	4414	279	416	3567	3235	6802	433	468
5/25/2017	Thu			50.7	49.3	5994	5830	11824	2330	2227	4557	485	282	3664	3603	7267	454	485
5/26/2017	Fri			52.2	47.8	6511	5958	12469	2508	2137	4645	550	310	4003	3821	7824	535	482
5/27/2017	Sat			51.9	48.1	6875	6375	13250	2925	1824	4749	619	328	3950	4551	8501	617	415
5/28/2017	Sun			50.4	49.6	6571	6458	13029	2795	1610	4405	631	343	3776	4848	8624	431	639
5/29/2017	Mon	*		49.9	50.1	6336	6351	12687	3196	1638	4834	734	370	3140	4713	7853	520	545
5/30/2017	Tue			49.9	50.1	5799	5815	11614	2169	2155	4324	481	333	3630	3660	7290	482	487
5/31/2017	Wed			51.2	48.8	6216	5935	12151	2487	2308	4795	477	347	3729	3627	7356	476	462

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

June, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
6/1/2017	Thu			50.9	49.1	5929	5714	11643	2318	2135	4453	467	302	3611	3579	7190	445	533
6/2/2017	Fri			51.3	48.7	6095	5781	11876	2296	2174	4470	476	330	3799	3607	7406	463	440
6/3/2017	Sat			50.9	49.1	6813	6571	13384	2938	1871	4809	607	348	3875	4700	8575	571	488
6/4/2017	Sun			50.1	49.9	5712	5695	11407	2382	1564	3946	540	345	3330	4131	7461	557	429
6/5/2017	Mon			50.7	49.3	5755	5602	11357	2242	2041	4283	505	291	3513	3561	7074	473	422
6/6/2017	Tue			50.8	49.2	5989	5807	11796	2287	2089	4376	473	343	3702	3718	7420	452	477
6/7/2017	Wed			51.3	48.7	6277	5952	12229	2528	2147	4675	436	322	3749	3805	7554	442	531
6/8/2017	Thu			51.0	49.0	6304	6058	12362	2641	2168	4809	551	331	3663	3890	7553	420	492
6/9/2017	Fri			51.8	48.2	6467	6007	12474	2562	2209	4771	504	338	3905	3798	7703	474	488
6/10/2017	Sat			51.9	48.1	6517	6048	12565	2718	2027	4745	480	449	3799	4021	7820	545	444
6/11/2017	Sun			51.2	48.8	6325	6034	12359	2629	1515	4144	601	319	3696	4519	8215	606	472
6/12/2017	Mon	*		50.0	50.0	5811	5818	11629	2460	1972	4432	591	349	3351	3846	7197	434	467
6/13/2017	Tue			50.4	49.6	5688	5600	11288	2152	2148	4300	460	298	3536	3452	6988	409	508
6/14/2017	Wed			50.3	49.7	5210	5151	10361	1957	2052	4009	408	293	3253	3099	6352	415	399
6/15/2017	Thu			50.4	49.6	5588	5503	11091	2051	2019	4070	442	302	3537	3484	7021	452	479
6/16/2017	Fri			50.5	49.5	6148	6019	12167	2355	2094	4449	526	332	3793	3925	7718	479	486
6/17/2017	Sat			51.2	48.8	6809	6487	13296	2838	1844	4682	615	351	3971	4643	8614	519	519
6/18/2017	Sun			50.0	50.0	5779	5776	11555	2344	1513	3857	509	351	3435	4263	7698	549	396
6/19/2017	Mon			50.9	49.1	5831	5620	11451	2281	2029	4310	523	293	3550	3591	7141	436	512
6/20/2017	Tue			50.4	49.6	5608	5524	11132	2233	2131	4364	468	368	3375	3393	6768	426	414
6/21/2017	Wed			50.9	49.1	5953	5738	11691	2225	2175	4400	416	320	3728	3563	7291	436	455
6/22/2017	Thu			51.0	49.0	6052	5823	11875	2325	2111	4436	491	339	3727	3712	7439	442	520
6/23/2017	Fri			51.7	48.3	6318	5893	12211	2409	2123	4532	479	299	3909	3770	7679	449	490
6/24/2017	Sat			51.5	48.5	7168	6746	13914	3245	2038	5283	657	454	3923	4708	8631	499	502
6/25/2017	Sun			50.3	49.7	6459	6386	12845	3034	1705	4739	635	432	3425	4681	8106	515	569
6/26/2017	Mon			50.0	50.0	5734	5740	11474	2299	2117	4416	458	338	3435	3623	7058	404	516
6/27/2017	Tue			50.1	49.9	5821	5787	11608	2304	2139	4443	454	335	3517	3648	7165	394	535
6/28/2017	Wed			51.1	48.9	6028	5757	11785	2331	2121	4452	394	375	3697	3636	7333	487	448
6/29/2017	Thu			51.3	48.7	6228	5922	12150	2425	2213	4638	498	370	3803	3709	7512	485	431
6/30/2017	Fri			51.5	48.5	6317	5949	12266	2354	2200	4554	475	326	3963	3749	7712	470	482

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

July, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
7/1/2017	Sat			51.5	48.5	6944	6527	13471	3025	1880	4905	671	355	3919	4647	8566	509	571
7/2/2017	Sun			50.6	49.4	6642	6496	13138	2890	1676	4566	677	386	3752	4820	8572	507	510
7/3/2017	Mon			51.5	48.5	6702	6299	13001	2657	2056	4713	618	325	4045	4243	8288	503	465
7/4/2017	Tue	*		49.9	50.1	6588	6602	13190	3358	1377	4735	636	304	3230	5225	8455	644	373
7/5/2017	Wed			50.6	49.4	6000	5850	11850	2176	2192	4368	506	308	3824	3658	7482	511	481
7/6/2017	Thu			50.4	49.6	6044	5958	12002	2382	2134	4516	489	317	3662	3824	7486	482	414
7/7/2017	Fri			51.3	48.7	6782	6434	13216	2661	2295	4956	538	350	4121	4139	8260	579	472
7/8/2017	Sat			51.7	48.3	7484	6979	14463	3439	2086	5525	640	477	4045	4893	8938	588	442
7/9/2017	Sun			50.8	49.2	6287	6101	12388	2764	1611	4375	661	338	3523	4490	8013	482	481
7/10/2017	Mon			50.5	49.5	5744	5630	11374	2262	2101	4363	496	309	3482	3529	7011	421	444
7/11/2017	Tue			51.3	48.7	5996	5703	11699	2349	2097	4446	497	314	3647	3606	7253	404	493
7/12/2017	Wed			51.2	48.8	5946	5664	11610	2282	2159	4441	409	359	3664	3505	7169	423	480
7/13/2017	Thu			51.1	48.9	6248	5978	12226	2503	2118	4621	517	306	3745	3860	7605	545	366
7/14/2017	Fri			52.1	47.9	6403	5881	12284	2597	2090	4687	520	319	3806	3791	7597	448	467
7/15/2017	Sat			51.0	49.0	7582	7292	14874	3403	1981	5384	730	429	4179	5311	9490	538	528
7/16/2017	Sun			50.1	49.9	6783	6745	13528	3021	1694	4715	699	394	3762	5051	8813	614	541
7/17/2017	Mon			50.4	49.6	5628	5545	11173	2198	2196	4394	464	332	3430	3349	6779	480	457
7/18/2017	Tue			50.3	49.7	5925	5853	11778	2366	2174	4540	517	321	3559	3679	7238	436	451
7/19/2017	Wed			50.5	49.5	5769	5656	11425	2314	2196	4510	451	343	3455	3460	6915	443	458
7/20/2017	Thu			50.3	49.7	6083	6008	12091	2436	2184	4620	491	314	3647	3824	7471	439	488
7/21/2017	Fri			52.0	48.0	6600	6096	12696	2452	2177	4629	528	352	4148	3919	8067	481	497
7/22/2017	Sat			52.2	47.8	6882	6299	13181	3107	1969	5076	611	448	3775	4330	8105	496	466
7/23/2017	Sun			50.4	49.6	6168	6081	12249	2663	1595	4258	650	325	3505	4486	7991	538	420
7/24/2017	Mon			50.0	50.0	5231	5223	10454	1899	2076	3975	386	371	3332	3147	6479	399	478
7/25/2017	Tue			51.4	48.6	5917	5585	11502	2271	2047	4318	543	304	3646	3538	7184	481	450
7/26/2017	Wed			49.8	50.2	5820	5861	11681	2255	2165	4420	519	312	3565	3696	7261	458	491
7/27/2017	Thu			50.1	49.9	6081	6045	12126	2434	2220	4654	501	336	3647	3825	7472	435	459
7/28/2017	Fri			50.9	49.1	6173	5947	12120	2417	2246	4663	462	327	3756	3701	7457	496	389
7/29/2017	Sat			50.9	49.1	6683	6444	13127	2832	1900	4732	647	332	3851	4544	8395	496	465
7/30/2017	Sun			51.0	49.0	6348	6091	12439	2889	1573	4462	614	343	3459	4518	7977	592	457
7/31/2017	Mon			51.2	48.8	5706	5446	11152	2224	2046	4270	474	341	3482	3400	6882	465	445

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

August, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
8/1/2017	Tue			50.6	49.4	5709	5569	11278	2122	2079	4201	418	318	3587	3490	7077	443	444
8/2/2017	Wed			51.1	48.9	5872	5618	11490	2292	2219	4511	452	348	3580	3399	6979	456	443
8/3/2017	Thu			51.0	49.0	6154	5905	12059	2406	2219	4625	534	326	3748	3686	7434	513	408
8/4/2017	Fri			51.0	49.0	6355	6107	12462	2387	2137	4524	495	354	3968	3970	7938	469	517
8/5/2017	Sat			51.8	48.2	7059	6578	13637	2978	1898	4876	566	433	4081	4680	8761	495	546
8/6/2017	Sun			50.7	49.3	6191	6015	12206	2640	1588	4228	561	358	3551	4427	7978	582	399
8/7/2017	Mon			50.3	49.7	5855	5783	11638	2291	2129	4420	486	312	3564	3654	7218	454	477
8/8/2017	Tue			51.0	49.0	5976	5750	11726	2244	2085	4329	472	299	3732	3665	7397	469	463
8/9/2017	Wed			49.9	50.1	5675	5708	11383	2251	2217	4468	441	287	3424	3491	6915	415	439
8/10/2017	Thu			50.0	50.0	5874	5877	11751	2367	2203	4570	451	333	3507	3674	7181	434	456
8/11/2017	Fri			50.7	49.3	6237	6073	12310	2395	2240	4635	414	339	3842	3833	7675	486	477
8/12/2017	Sat			52.3	47.7	6890	6292	13182	2914	1824	4738	678	357	3976	4468	8444	555	449
8/13/2017	Sun			49.9	50.1	6145	6167	12312	2674	1650	4324	582	378	3471	4517	7988	557	455
8/14/2017	Mon			50.3	49.7	5426	5360	10786	2045	2087	4132	439	269	3381	3273	6654	422	444
8/15/2017	Tue			50.2	49.8	5550	5501	11051	2250	2123	4373	448	324	3300	3378	6678	429	446
8/16/2017	Wed			50.7	49.3	5618	5470	11088	2163	2180	4343	407	289	3455	3290	6745	453	442
8/17/2017	Thu			51.3	48.7	5959	5668	11627	2354	2150	4504	469	278	3605	3518	7123	444	436
8/18/2017	Fri	*		51.1	48.9	6596	6319	12915	2676	2066	4742	594	341	3920	4253	8173	492	471
8/19/2017	Sat			51.0	49.0	6723	6471	13194	2970	1803	4773	608	337	3753	4668	8421	552	453
8/20/2017	Sun			50.5	49.5	6101	5989	12090	2784	1572	4356	575	341	3317	4417	7734	555	457
8/21/2017	Mon			50.0	50.0	5271	5276	10547	2012	2199	4211	409	313	3259	3077	6336	408	432
8/22/2017	Tue			50.3	49.7	5462	5390	10852	2156	2031	4187	414	294	3306	3359	6665	406	442
8/23/2017	Wed			50.1	49.9	5550	5517	11067	2180	2199	4379	427	283	3370	3318	6688	437	458
8/24/2017	Thu			50.4	49.6	5754	5659	11413	2294	2182	4476	417	300	3460	3477	6937	427	458
8/25/2017	Fri			51.2	48.8	6033	5742	11775	2333	2192	4525	427	318	3700	3550	7250	425	482
8/26/2017	Sat			51.7	48.3	6113	5713	11826	2496	1725	4221	560	331	3617	3988	7605	532	446
8/27/2017	Sun			50.2	49.8	5919	5875	11794	2743	1545	4288	576	371	3176	4330	7506	572	436
8/28/2017	Mon			50.5	49.5	5262	5166	10428	2022	1991	4013	431	284	3240	3175	6415	374	454
8/29/2017	Tue			50.2	49.8	5188	5148	10336	2131	2109	4240	423	286	3057	3039	6096	348	487
8/30/2017	Wed			50.6	49.4	5343	5208	10551	2053	2137	4190	336	339	3290	3071	6361	443	421
8/31/2017	Thu			50.8	49.2	5733	5554	11287	2318	2294	4612	277	480	3415	3260	6675	448	436

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

September, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
9/1/2017	Fri			51.5	48.5	6010	5667	11677	2368	2104	4472	489	307	3642	3563	7205	444	486
9/2/2017	Sat			51.7	48.3	6692	6253	12945	2942	1869	4811	596	355	3750	4384	8134	572	420
9/3/2017	Sun			51.0	49.0	6382	6126	12508	2926	1615	4541	658	394	3456	4511	7967	511	439
9/4/2017	Mon	*		49.2	50.8	6071	6279	12350	3169	1658	4827	683	336	2902	4621	7523	488	557
9/5/2017	Tue			49.8	50.2	5486	5521	11007	2135	2139	4274	472	280	3351	3382	6733	416	491
9/6/2017	Wed			51.3	48.7	6024	5721	11745	2470	2280	4750	437	306	3554	3441	6995	495	443
9/7/2017	Thu			50.6	49.4	5912	5779	11691	2474	2347	4821	380	407	3438	3432	6870	452	510
9/8/2017	Fri			51.7	48.3	6126	5725	11851	2502	2248	4750	486	348	3624	3477	7101	458	428
9/9/2017	Sat			51.5	48.5	6214	5851	12065	2566	1840	4406	486	376	3648	4011	7659	461	506
9/10/2017	Sun			49.7	50.3	5231	5298	10529	2317	1561	3878	459	370	2914	3737	6651	451	431
9/11/2017	Mon			50.0	50.0	4953	4956	9909	1881	1988	3869	404	276	3072	2968	6040	393	419
9/12/2017	Tue			49.9	50.1	5339	5350	10689	2146	2140	4286	429	323	3193	3210	6403	399	484
9/13/2017	Wed			50.3	49.7	5592	5534	11126	2269	2263	4532	324	402	3323	3271	6594	452	460
9/14/2017	Thu			51.1	48.9	5643	5410	11053	2343	2189	4532	336	390	3300	3221	6521	433	432
9/15/2017	Fri			50.8	49.2	5791	5598	11389	2250	2153	4403	421	302	3541	3445	6986	470	476
9/16/2017	Sat			51.1	48.9	6135	5871	12006	2424	1833	4257	504	371	3711	4038	7749	525	454
9/17/2017	Sun			48.9	51.1	5157	5379	10536	2094	1589	3683	418	313	3063	3790	6853	399	488
9/18/2017	Mon			50.1	49.9	5087	5058	10145	1979	2010	3989	422	230	3108	3048	6156	400	432
9/19/2017	Tue			49.7	50.3	5121	5178	10299	1961	2114	4075	389	293	3160	3064	6224	427	445
9/20/2017	Wed			50.0	50.0	5308	5316	10624	2057	2124	4181	339	334	3251	3192	6443	450	433
9/21/2017	Thu			50.3	49.7	5714	5641	11355	2294	2318	4612	418	339	3420	3323	6743	469	423
9/22/2017	Fri			51.9	48.1	6433	5969	12402	2620	2271	4891	462	327	3813	3698	7511	527	508
9/23/2017	Sat			51.1	48.9	6885	6579	13464	2802	1969	4771	561	365	4083	4610	8693	502	562
9/24/2017	Sun			49.2	50.8	5428	5596	11024	2364	1541	3905	490	311	3064	4055	7119	451	472
9/25/2017	Mon			50.0	50.0	5016	5016	10032	1924	2054	3978	411	268	3092	2962	6054	400	406
9/26/2017	Tue			49.4	50.6	5043	5172	10215	1921	2039	3960	286	350	3122	3133	6255	393	476
9/27/2017	Wed			50.4	49.6	4959	4890	9849	1796	1972	3768	225	372	3163	2918	6081	449	364
9/28/2017	Thu			50.8	49.2	5658	5473	11131	2272	2227	4499	424	312	3386	3246	6632	465	409
9/29/2017	Fri			50.8	49.2	5768	5591	11359	2254	2209	4463	270	457	3514	3382	6896	445	430
9/30/2017	Sat			51.1	48.9	5793	5554	11347	2366	1755	4121	528	320	3427	3799	7226	386	503

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

October, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
10/1/2017	Sun			49.6	50.4	5032	5109	10141	2133	1472	3605	471	310	2899	3637	6536	391	454
10/2/2017	Mon			49.7	50.3	5417	5475	10892	2182	2224	4406	365	372	3235	3251	6486	440	444
10/3/2017	Tue			51.4	48.6	6149	5822	11971	2609	2308	4917	461	356	3540	3514	7054	468	474
10/4/2017	Wed			51.1	48.9	5667	5432	11099	2227	2158	4385	418	274	3440	3274	6714	488	431
10/5/2017	Thu			50.5	49.5	5602	5498	11100	2221	2105	4326	303	412	3381	3393	6774	482	492
10/6/2017	Fri			51.5	48.5	5901	5564	11465	2243	2105	4348	387	351	3658	3459	7117	468	459
10/7/2017	Sat			51.8	48.2	6210	5782	11992	2664	1957	4621	541	372	3546	3825	7371	487	446
10/8/2017	Sun			51.3	48.7	6151	5835	11986	2645	1740	4385	533	382	3506	4095	7601	566	436
10/9/2017	Mon			50.7	49.3	6193	6024	12217	2704	2061	4765	583	385	3489	3963	7452	484	483
10/10/2017	Tue			50.4	49.6	5504	5417	10921	2145	2054	4199	428	333	3359	3363	6722	428	498
10/11/2017	Wed			50.5	49.5	5298	5198	10496	2042	1968	4010	378	336	3256	3230	6486	385	474
10/12/2017	Thu			51.1	48.9	5739	5500	11239	2250	2042	4292	446	325	3489	3458	6947	452	476
10/13/2017	Fri			50.1	49.9	5966	5946	11912	2281	2229	4510	440	324	3685	3717	7402	484	462
10/14/2017	Sat			50.3	49.7	6210	6135	12345	2444	1885	4329	494	377	3766	4250	8016	525	489
10/15/2017	Sun			50.1	49.9	5297	5285	10582	2249	1541	3790	477	322	3048	3744	6792	359	509
10/16/2017	Mon			50.1	49.9	5011	4993	10004	1988	2128	4116	389	315	3023	2865	5888	393	429
10/17/2017	Tue			50.3	49.7	5109	5051	10160	1934	2084	4018	250	425	3175	2967	6142	395	447
10/18/2017	Wed			50.0	50.0	4958	4960	9918	1844	1992	3836	372	257	3114	2968	6082	389	398
10/19/2017	Thu			50.3	49.7	5379	5309	10688	2057	2149	4206	288	409	3322	3160	6482	433	483
10/20/2017	Fri			51.9	48.1	6079	5643	11722	2397	2115	4512	480	310	3682	3528	7210	454	509
10/21/2017	Sat			51.6	48.4	6786	6357	13143	2784	1997	4781	527	399	4002	4360	8362	593	515
10/22/2017	Sun			51.2	48.8	6009	5737	11746	2774	1803	4577	504	405	3235	3934	7169	560	382
10/23/2017	Mon			50.1	49.9	4843	4827	9670	2129	2207	4336	416	347	2714	2620	5334	358	409
10/24/2017	Tue			50.3	49.7	5288	5219	10507	1924	2129	4053	405	308	3364	3090	6454	414	436
10/25/2017	Wed			50.3	49.7	5365	5304	10669	2041	2238	4279	411	294	3324	3066	6390	432	459
10/26/2017	Thu			50.3	49.7	5572	5501	11073	2110	2195	4305	437	295	3462	3306	6768	511	461
10/27/2017	Fri			48.9	51.1	5820	6074	11894	2229	2444	4673	445	397	3591	3630	7221	455	512
10/28/2017	Sat			51.7	48.3	5436	5069	10505	2432	1949	4381	504	386	3004	3120	6124	303	569
10/29/2017	Sun			50.4	49.6	5086	5000	10086	2184	1547	3731	476	292	2902	3453	6355	412	443
10/30/2017	Mon			50.4	49.6	5470	5383	10853	2232	2213	4445	417	339	3238	3170	6408	460	410
10/31/2017	Tue			49.6	50.4	5033	5107	10140	1886	2065	3951	280	350	3147	3042	6189	497	396

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

November, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
11/1/2017	Wed			51.4	48.6	5593	5298	10891	2308	2156	4464	401	316	3285	3142	6427	430	485
11/2/2017	Thu			51.3	48.7	6018	5721	11739	2540	2300	4840	331	466	3478	3421	6899	504	520
11/3/2017	Fri		3	51.4	48.6	6036	5715	11751	2390	2174	4564	472	296	3646	3541	7187	510	493
11/4/2017	Sat			51.9	48.1	6396	5924	12320	2697	1978	4675	519	401	3699	3946	7645	583	411
11/5/2017	Sun			50.6	49.4	5394	5263	10657	2274	1600	3874	466	320	3120	3663	6783	390	490
11/6/2017	Mon			50.0	50.0	5409	5401	10810	2149	2078	4227	438	302	3260	3323	6583	416	492
11/7/2017	Tue			50.8	49.2	5727	5540	11267	2324	2329	4653	445	366	3403	3211	6614	465	487
11/8/2017	Wed			50.0	50.0	5235	5239	10474	2093	2195	4288	296	479	3142	3044	6186	394	460
11/9/2017	Thu			50.3	49.7	5724	5661	11385	2231	2272	4503	407	353	3493	3389	6882	464	469
11/10/2017	Fri	*		51.8	48.2	6400	5949	12349	2917	1933	4850	563	343	3483	4016	7499	474	486
11/11/2017	Sat			50.0	50.0	5614	5607	11221	2503	1935	4438	461	369	3111	3672	6783	412	507
11/12/2017	Sun			49.3	50.7	5377	5535	10912	2243	1513	3756	503	333	3134	4022	7156	468	471
11/13/2017	Mon			49.8	50.2	5251	5298	10549	2021	2093	4114	374	314	3230	3205	6435	460	466
11/14/2017	Tue			50.3	49.7	5436	5373	10809	2052	2104	4156	428	285	3384	3269	6653	454	507
11/15/2017	Wed			50.3	49.7	5234	5164	10398	2073	2183	4256	389	343	3161	2981	6142	424	451
11/16/2017	Thu			50.7	49.3	5380	5236	10616	2096	2208	4304	364	344	3284	3028	6312	422	434
11/17/2017	Fri			51.6	48.4	5924	5561	11485	2338	2172	4510	309	436	3586	3389	6975	456	500
11/18/2017	Sat			51.0	49.0	5996	5752	11748	2553	1768	4321	489	368	3443	3984	7427	290	678
11/19/2017	Sun			50.0	50.0	5045	5037	10082	1959	1543	3502	375	322	3086	3494	6580	393	499
11/20/2017	Mon			49.5	50.5	4942	5051	9993	1797	2071	3868	292	341	3145	2980	6125	418	467
11/21/2017	Tue			49.4	50.6	5284	5416	10700	1936	2160	4096	403	289	3348	3256	6604	418	508
11/22/2017	Wed			50.2	49.8	5459	5414	10873	2088	2194	4282	352	368	3371	3220	6591	441	414
11/23/2017	Thu	*		50.7	49.3	4557	4438	8995	1803	1212	3015	437	282	2754	3226	5980	363	403
11/24/2017	Fri		3	51.6	48.4	5377	5034	10411	2019	1708	3727	491	329	3358	3326	6684	449	410
11/25/2017	Sat			50.6	49.4	5476	5337	10813	2152	1751	3903	508	371	3324	3586	6910	494	401
11/26/2017	Sun			49.8	50.2	4813	4861	9674	1773	1453	3226	369	372	3040	3408	6448	426	430
11/27/2017	Mon			49.6	50.4	4837	4917	9754	1687	2084	3771	344	306	3150	2833	5983	408	434
11/28/2017	Tue			50.0	50.0	5173	5182	10355	1943	2140	4083	359	326	3230	3042	6272	446	443
11/29/2017	Wed			49.7	50.3	5167	5222	10389	2130	2151	4281	391	274	3037	3071	6108	411	475
11/30/2017	Thu			50.5	49.5	5336	5223	10559	2095	2187	4282	295	412	3241	3036	6277	442	473

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

December, 2017

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
12/1/2017	Fri			50.9	49.1	5256	5078	10334	1991	2090	4081	366	309	3265	2988	6253	449	412
12/2/2017	Sat			52.6	47.4	5559	5000	10559	2050	1730	3780	415	323	3509	3270	6779	402	450
12/3/2017	Sun			49.0	51.0	5249	5470	10719	2037	1676	3713	431	321	3212	3794	7006	482	424
12/4/2017	Mon			50.4	49.6	4973	4894	9867	1924	2075	3999	378	284	3049	2819	5868	420	477
12/5/2017	Tue			49.5	50.5	5276	5387	10663	1893	2218	4111	401	318	3383	3169	6552	450	512
12/6/2017	Wed			50.8	49.2	5563	5396	10959	2054	2220	4274	411	306	3509	3176	6685	464	447
12/7/2017	Thu			49.9	50.1	5534	5562	11096	2142	2228	4370	383	332	3392	3334	6726	433	491
12/8/2017	Fri			51.2	48.8	6856	6543	13399	2597	2191	4788	438	364	4259	4352	8611	528	760
12/9/2017	Sat			50.9	49.1	6292	6074	12366	2640	1917	4557	534	354	3652	4157	7809	501	494
12/10/2017	Sun			50.5	49.5	5221	5122	10343	2218	1653	3871	418	334	3003	3469	6472	397	469
12/11/2017	Mon			51.1	48.9	5684	5439	11123	2541	2092	4633	457	335	3143	3347	6490	413	555
12/12/2017	Tue			50.5	49.5	5293	5181	10474	1949	2246	4195	359	354	3344	2935	6279	394	448
12/13/2017	Wed			50.4	49.6	5843	5744	11587	2329	2428	4757	441	376	3514	3316	6830	529	432
12/14/2017	Thu			50.3	49.7	5698	5636	11334	2243	2370	4613	428	422	3455	3266	6721	466	473
12/15/2017	Fri			50.4	49.6	5693	5602	11295	2165	2346	4511	393	358	3528	3256	6784	424	452
12/16/2017	Sat			51.7	48.3	6223	5821	12044	2689	1776	4465	580	369	3534	4045	7579	495	459
12/17/2017	Sun			51.5	48.5	5786	5444	11230	2957	1553	4510	623	307	2829	3891	6720	489	380
12/18/2017	Mon			51.5	48.5	6463	6089	12552	3060	2073	5133	530	336	3403	4016	7419	411	551
12/19/2017	Tue			49.8	50.2	5347	5389	10736	2027	2214	4241	382	378	3320	3175	6495	399	489
12/20/2017	Wed			50.0	50.0	5381	5391	10772	1965	2275	4240	404	351	3416	3116	6532	445	468
12/21/2017	Thu			49.9	50.1	5649	5669	11318	2035	2040	4075	470	346	3614	3629	7243	510	475
12/22/2017	Fri			50.6	49.4	5772	5624	11396	2062	2106	4168	452	352	3710	3518	7228	410	510
12/23/2017	Sat			50.8	49.2	6209	6007	12216	2438	1777	4215	574	369	3771	4230	8001	551	498
12/24/2017	Sun			50.9	49.1	5198	5009	10207	2119	1411	3530	455	318	3079	3598	6677	363	510
12/25/2017	Mon	*		51.1	48.9	5049	4840	9889	1918	1008	2926	486	267	3131	3832	6963	460	419
12/26/2017	Tue		3	52.5	47.5	5436	4924	10360	2235	1834	4069	506	349	3201	3090	6291	468	475
12/27/2017	Wed			50.4	49.6	5853	5752	11605	2287	2017	4304	515	395	3566	3735	7301	515	479
12/28/2017	Thu			51.3	48.7	6597	6267	12864	2625	2066	4691	630	392	3972	4201	8173	575	534
12/29/2017	Fri			51.4	48.6	6531	6175	12706	2667	2171	4838	642	384	3864	4004	7868	493	521
12/30/2017	Sat			51.4	48.6	6369	6018	12387	2577	1733	4310	595	382	3792	4285	8077	542	491
12/31/2017	Sun			50.9	49.1	5521	5330	10851	2490	1594	4084	534	344	3031	3736	6767	480	416

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

STATION: 083016
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2018 - 2018
LOC'N 21.598398 -158.099586

Oahu
DIRECTION 01 (D1): Northbound, MOV 1
DIRECTION 02 (D2): Southbound, MOV 5

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	10992	11457	11038	11394	11942	12256	11319	11365	11485	0.99731	1.00791
February	10640	11054	11025	10886	11738	12055	11336	11069	11248	1.01839	1.03485
March	10943	11187	11144	11320	11061	12029	10958	11131	11234	1.01959	1.02908
April	10638	10868	10791	10884	11815	11634	10839	10999	11067	1.03502	1.04140
May	10812	11089	10914	11256	11824	12739	11656	11179	11470	0.99866	1.02466
June	11264	11528	11741	11918	12598	13551	11852	11810	12065	0.94944	0.96992
July	11760	12030	11645	12310	12902	13592	12224	12129	12352	0.92737	0.94437
August	11066	11418	11554	11821	12199	12838	11602	11612	11785	0.97194	0.98648
September	10785	11016	9866	10271	11189	12373	11093	10625	10942	1.04684	1.07803
October	10965	11226	11118	11194	11781	12017	10607	11257	11272	1.01615	1.01758
November	11127	11126	11086	11422	11151	11062	10354	11182	11047	1.03692	1.02435
December	11216	11094	11634	11601	12052	11793	11022	11519	11487	0.99714	0.99438
AVERAGE	11017	11258	11130	11356	11854	12328	11238	AVERAGE 11323	D1+D2 AADT 11455		

K-FACTOR 9.45%
K-FACTOR PERIOD AM
D-FACTOR 54.90%

STATION: 083016
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2018 - 2018
LOC'N 21.598398 -158.099586
Oahu
DIRECTION 01 (D1): Northbound, MOV 1

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	5514	5755	5506	5714	6079	6272	5720	5714	5794	0.99353	1.00753
February	5240	5504	5494	5432	5918	6108	5612	5518	5615	1.02516	1.04332
March	5426	5590	5575	5697	5604	6186	5502	5578	5654	1.01811	1.03198
April	5240	5431	5354	5407	5975	5823	5373	5481	5515	1.04392	1.05026
May	5390	5507	5391	5594	5984	6476	5781	5573	5732	1.00434	1.03293
June	5639	5753	5875	6028	6449	6917	5962	5949	6089	0.94545	0.96774
July	5880	6083	5837	6194	6612	6888	6201	6121	6242	0.92227	0.94051
August	5524	5654	5794	5953	6228	6569	5768	5831	5927	0.97124	0.98732
September	5354	5426	4898	5146	5608	6282	5538	5286	5464	1.05350	1.08900
October	5419	5599	5576	5591	5915	6117	5284	5620	5643	1.02018	1.02435
November	5578	5597	5548	5740	5655	5630	5199	5623	5564	1.03471	1.02372
December	5672	5568	5880	5901	6122	6115	5634	5828	5842	0.98548	0.98770
AVERAGE	5490	5622	5561	5700	6012	6282	5631	AVERAGE 5677	D1 AADT 5757		

STATION: 083016
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2018 - 2018
LOC'N 21.598398 -158.099586
Oahu
DIRECTION 02 (D2): Southbound, MOV 5

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	5478	5702	5531	5681	5863	5985	5599	5651	5691	1.00117	1.00830
February	5400	5550	5532	5454	5820	5947	5724	5551	5632	1.01164	1.02643
March	5517	5597	5569	5623	5457	5843	5456	5552	5580	1.02110	1.02618
April	5398	5437	5437	5477	5841	5811	5467	5518	5552	1.02618	1.03261
May	5422	5582	5522	5662	5840	6263	5875	5606	5738	0.99298	1.01645
June	5626	5775	5866	5890	6149	6634	5890	5861	5976	0.95350	0.97213
July	5881	5948	5808	6116	6290	6704	6023	6008	6110	0.93257	0.94831
August	5541	5764	5760	5868	5971	6268	5834	5781	5858	0.97264	0.98564
September	5432	5590	4968	5125	5582	6092	5555	5339	5478	1.04021	1.06716
October	5546	5627	5542	5603	5866	5900	5323	5637	5630	1.01212	1.01084
November	5549	5529	5538	5682	5497	5432	5155	5559	5483	1.03916	1.02498
December	5544	5526	5755	5700	5930	5679	5388	5691	5646	1.00921	1.00122
AVERAGE	5528	5635	5569	5657	5842	6046	5607	AVERAGE 5646	D2 AADT 5698		

January, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
1/1/2018	Mon	*		49.9	50.1	5490	5506	10996	2265	1317	3582	575	298	3225	4189	7414	522	498
1/2/2018	Tue			50.9	49.1	6478	6242	12720	2703	2089	4792	620	419	3775	4153	7928	537	523
1/3/2018	Wed			49.5	50.5	5862	5992	11854	2212	2094	4306	462	347	3650	3898	7548	432	541
1/4/2018	Thu			50.1	49.9	6068	6036	12104	2500	2081	4581	550	338	3568	3955	7523	472	525
1/5/2018	Fri			50.7	49.3	6196	6028	12224	2390	2273	4663	538	377	3806	3755	7561	524	469
1/6/2018	Sat			50.5	49.5	6094	5974	12068	2646	1784	4430	623	358	3448	4190	7638	461	501
1/7/2018	Sun			50.2	49.8	5461	5419	10880	2392	1483	3875	560	368	3069	3936	7005	500	408
1/8/2018	Mon			50.5	49.5	5640	5539	11179	2136	2132	4268	477	314	3504	3407	6911	483	460
1/9/2018	Tue			49.8	50.2	5778	5822	11600	2217	2230	4447	495	348	3561	3592	7153	529	514
1/10/2018	Wed			50.3	49.7	5639	5562	11201	2233	2157	4390	440	325	3406	3405	6811	472	481
1/11/2018	Thu			50.2	49.8	5717	5676	11393	2251	2123	4374	444	294	3466	3553	7019	437	491
1/12/2018	Fri			50.6	49.4	6164	6009	12173	2284	2177	4461	499	323	3880	3832	7712	502	537
1/13/2018	Sat			52.4	47.6	6844	6218	13062	2954	1912	4866	672	400	3890	4306	8196	561	481
1/14/2018	Sun			52.1	47.9	6353	5839	12192	2970	1631	4601	585	359	3383	4208	7591	547	439
1/15/2018	Mon	*		50.7	49.3	5954	5800	11754	2539	1732	4271	602	337	3415	4068	7483	613	461
1/16/2018	Tue			49.7	50.3	5560	5622	11182	2147	2116	4263	474	299	3413	3506	6919	464	503
1/17/2018	Wed			49.9	50.1	5315	5341	10656	1961	2205	4166	356	336	3354	3136	6490	463	475
1/18/2018	Thu			49.8	50.2	5416	5457	10873	2087	2175	4262	432	309	3329	3282	6611	470	436
1/19/2018	Fri			50.6	49.4	5650	5513	11163	2107	2234	4341	399	339	3543	3279	6822	515	418
1/20/2018	Sat			50.6	49.4	5713	5583	11296	2305	1828	4133	524	351	3408	3755	7163	455	482
1/21/2018	Sun			50.5	49.5	5167	5073	10240	2197	1500	3697	433	331	2970	3573	6543	343	479
1/22/2018	Mon			50.0	50.0	5504	5515	11019	2241	2125	4366	471	290	3263	3390	6653	429	501
1/23/2018	Tue			50.8	49.2	5527	5356	10883	2193	2115	4308	448	318	3334	3241	6575	446	496
1/24/2018	Wed			49.8	50.2	5635	5669	11304	2212	2230	4442	390	342	3423	3439	6862	485	499
1/25/2018	Thu			50.4	49.6	5653	5554	11207	2212	2244	4456	367	343	3441	3310	6751	469	476
1/26/2018	Fri			51.7	48.3	6305	5901	12206	2625	2242	4867	488	366	3680	3659	7339	479	505
1/27/2018	Sat			51.1	48.9	6435	6163	12598	2786	1894	4680	585	403	3649	4269	7918	610	414
1/28/2018	Sun			49.3	50.7	5898	6065	11963	2656	1717	4373	562	402	3242	4348	7590	527	452
1/29/2018	Mon			50.1	49.9	5399	5379	10778	2176	2125	4301	454	311	3223	3254	6477	439	502
1/30/2018	Tue			49.8	50.2	5434	5468	10902	2163	2161	4324	408	318	3271	3307	6578	417	472
1/31/2018	Wed			49.9	50.1	5081	5093	10174	1870	2237	4107	248	441	3211	2856	6067	435	402

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

February, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
2/1/2018	Thu			50.2	49.8	5282	5232	10514	2178	2049	4227	389	295	3104	3183	6287	393	473
2/2/2018	Fri			50.2	49.8	5436	5392	10828	2017	1989	4006	409	314	3419	3403	6822	420	505
2/3/2018	Sat			51.1	48.9	5980	5734	11714	2596	1767	4363	564	381	3384	3967	7351	522	438
2/4/2018	Sun		3	49.8	50.2	4180	4211	8391	1892	1487	3379	368	334	2288	2724	5012	389	401
2/5/2018	Mon			49.3	50.7	5044	5182	10226	1995	2104	4099	403	347	3049	3078	6127	382	524
2/6/2018	Tue			50.0	50.0	5512	5514	11026	2101	2172	4273	416	321	3411	3342	6753	455	457
2/7/2018	Wed			50.3	49.7	5533	5461	10994	2146	2164	4310	413	314	3387	3297	6684	450	428
2/8/2018	Thu			49.5	50.5	5406	5511	10917	2083	2175	4258	456	337	3323	3336	6659	367	498
2/9/2018	Fri			50.2	49.8	5839	5791	11630	2185	2253	4438	433	318	3654	3538	7192	478	477
2/10/2018	Sat			50.7	49.3	6022	5847	11869	2309	1762	4071	540	336	3713	4085	7798	480	497
2/11/2018	Sun			50.3	49.7	6092	6017	12109	2555	1674	4229	616	350	3537	4343	7880	604	460
2/12/2018	Mon			49.6	50.4	5769	5865	11634	2393	2174	4567	515	354	3376	3691	7067	408	517
2/13/2018	Tue			49.8	50.2	5316	5357	10673	1985	2163	4148	377	334	3331	3194	6525	449	428
2/14/2018	Wed		3	50.3	49.7	4799	4745	9544	1667	2107	3774	296	337	3132	2638	5770	377	369
2/15/2018	Thu			49.6	50.4	5435	5518	10953	1918	2096	4014	420	284	3517	3422	6939	411	484
2/16/2018	Fri			51.2	48.8	6475	6174	12649	2624	2189	4813	497	389	3851	3985	7836	466	520
2/17/2018	Sat			50.8	49.2	6646	6444	13090	2692	2017	4709	572	434	3954	4427	8381	548	484
2/18/2018	Sun			48.7	51.3	5469	5755	11224	2116	1794	3910	391	391	3353	3961	7314	433	718
2/19/2018	Mon	*		49.8	50.2	6203	6256	12459	2509	1863	4372	631	425	3694	4393	8087	553	539
2/20/2018	Tue			49.6	50.4	5862	5947	11809	2353	2239	4592	528	337	3509	3708	7217	465	492
2/21/2018	Wed			49.5	50.5	5737	5856	11593	2226	2276	4502	433	342	3511	3580	7091	457	498
2/22/2018	Thu			50.2	49.8	5606	5554	11160	2276	2458	4734	329	448	3330	3096	6426	462	469
2/23/2018	Fri			50.0	50.0	5923	5923	11846	2249	2230	4479	437	351	3674	3693	7367	477	495
2/24/2018	Sat			50.1	49.9	5783	5762	11545	2221	2022	4243	436	437	3562	3740	7302	503	440
2/25/2018	Sun			49.4	50.6	5275	5399	10674	1954	1504	3458	488	337	3321	3895	7216	419	528
2/26/2018	Mon			48.8	51.2	4907	5154	10061	1758	2210	3968	362	320	3149	2944	6093	426	414
2/27/2018	Tue			49.7	50.3	5327	5381	10708	1929	2064	3993	415	291	3398	3317	6715	423	456
2/28/2018	Wed			49.7	50.3	5211	5278	10489	1839	2114	3953	303	339	3372	3164	6536	425	486

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

March, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
3/1/2018	Thu			50.2	49.8	5380	5337	10717	2037	2069	4106	415	292	3343	3268	6611	459	452
3/2/2018	Fri			49.9	50.1	5460	5485	10945	2047	2071	4118	408	293	3413	3414	6827	382	511
3/3/2018	Sat			50.4	49.6	6012	5916	11928	2232	1802	4034	532	354	3780	4114	7894	478	470
3/4/2018	Sun			49.8	50.2	5402	5444	10846	2294	1540	3834	529	326	3108	3904	7012	485	412
3/5/2018	Mon			49.0	51.0	5483	5717	11200	2094	2241	4335	418	343	3389	3476	6865	421	493
3/6/2018	Tue			49.8	50.2	5500	5545	11045	2069	2288	4357	367	372	3431	3257	6688	470	433
3/7/2018	Wed			49.3	50.7	5303	5462	10765	2017	2127	4144	397	302	3286	3335	6621	436	483
3/8/2018	Thu			50.3	49.7	5520	5450	10970	2138	2188	4326	419	355	3382	3262	6644	401	473
3/9/2018	Fri			50.9	49.1	5379	5196	10575	1838	2026	3864	390	330	3541	3170	6711	454	432
3/10/2018	Sat			53.4	46.6	6908	6022	12930	3005	1958	4963	535	372	3903	4064	7967	551	437
3/11/2018	Sun			49.9	50.1	4921	4944	9865	1959	1581	3540	396	354	2962	3363	6325	509	381
3/12/2018	Mon			49.7	50.3	5220	5285	10505	1903	2193	4096	394	353	3317	3092	6409	420	456
3/13/2018	Tue			50.2	49.8	5299	5261	10560	1930	2228	4158	344	365	3369	3033	6402	469	444
3/14/2018	Wed			50.3	49.7	5473	5398	10871	2095	2322	4417	372	392	3378	3076	6454	446	455
3/15/2018	Thu			49.8	50.2	5495	5540	11035	2068	2199	4267	430	320	3427	3341	6768	427	474
3/16/2018	Fri			51.1	48.9	5883	5623	11506	2275	2154	4429	413	302	3608	3469	7077	445	472
3/17/2018	Sat			51.0	49.0	6756	6490	13246	2847	1885	4732	618	386	3909	4605	8514	589	479
3/18/2018	Sun			50.6	49.4	5851	5703	11554	2477	1892	4369	469	347	3374	3811	7185	577	447
3/19/2018	Mon			50.1	49.9	5575	5548	11123	2131	2164	4295	469	382	3444	3384	6828	421	492
3/20/2018	Tue			50.4	49.6	5737	5639	11376	2313	2148	4461	509	369	3424	3491	6915	489	460
3/21/2018	Wed			50.6	49.4	5816	5680	11496	2200	2225	4425	488	336	3616	3455	7071	458	490
3/22/2018	Thu			50.7	49.3	5632	5476	11108	2289	2310	4599	433	401	3343	3166	6509	406	482
3/23/2018	Fri			50.8	49.2	5693	5523	11216	2220	2206	4426	433	371	3473	3317	6790	442	474
3/24/2018	Sat			51.3	48.7	5064	4800	9864	1751	1708	3459	339	366	3313	3092	6405	391	396
3/25/2018	Sun			50.4	49.6	5835	5731	11566	2288	1430	3718	559	277	3547	4301	7848	575	442
3/26/2018	Mon	*		50.7	49.3	5950	5785	11735	2296	1988	4284	508	327	3654	3797	7451	560	386
3/27/2018	Tue			49.5	50.5	5824	5941	11765	2240	2305	4545	415	450	3584	3636	7220	468	484
3/28/2018	Wed			49.9	50.1	5707	5737	11444	2188	2175	4363	460	313	3519	3562	7081	468	484
3/29/2018	Thu			50.6	49.4	6459	6313	12772	2666	2586	5252	711	577	3793	3727	7520	472	507
3/30/2018	Fri	*		51.2	48.8	6547	6239	12786	2640	2017	4657	589	376	3907	4222	8129	525	518
3/31/2018	Sat			50.8	49.2	6191	5986	12177	2897	2054	4951	524	584	3294	3932	7226	433	608

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

April, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
4/1/2018	Sun	*		49.9	50.1	5681	5696	11377	2683	1597	4280	581	387	2998	4099	7097	501	463
4/2/2018	Mon			49.2	50.8	4907	5059	9966	2011	2149	4160	362	381	2896	2910	5806	393	485
4/3/2018	Tue			50.2	49.8	5437	5386	10823	2230	2153	4383	461	287	3207	3233	6440	367	481
4/4/2018	Wed			49.4	50.6	5037	5167	10204	1900	2180	4080	260	400	3137	2987	6124	402	435
4/5/2018	Thu			50.0	50.0	5326	5332	10658	2104	2104	4208	432	304	3222	3228	6450	387	450
4/6/2018	Fri			50.1	49.9	5800	5773	11573	2198	2345	4543	446	382	3602	3428	7030	448	503
4/7/2018	Sat			52.0	48.0	6161	5698	11859	2636	1908	4544	535	401	3525	3790	7315	541	461
4/8/2018	Sun			50.2	49.8	4990	4952	9942	2043	1561	3604	424	343	2947	3391	6338	388	491
4/9/2018	Mon			49.7	50.3	5437	5501	10938	1966	2255	4221	399	345	3471	3246	6717	464	438
4/10/2018	Tue			50.3	49.7	5705	5640	11345	2259	2248	4507	470	390	3446	3392	6838	416	497
4/11/2018	Wed			49.6	50.4	5662	5751	11413	2160	2429	4589	362	373	3502	3322	6824	452	500
4/12/2018	Thu			49.3	50.7	5650	5800	11450	2216	2355	4571	366	372	3434	3445	6879	457	457
4/13/2018	Fri			51.4	48.6	6163	5837	12000	2420	2225	4645	454	372	3743	3612	7355	465	474
4/14/2018	Sat			51.2	48.8	5601	5348	10949	2241	1850	4091	503	367	3360	3498	6858	483	451
4/15/2018	Sun			49.4	50.6	4958	5074	10032	1930	1566	3496	448	357	3028	3508	6536	462	400
4/16/2018	Mon			48.8	51.2	4983	5233	10216	1858	2162	4020	318	352	3125	3071	6196	408	440
4/17/2018	Tue			49.5	50.5	5206	5306	10512	1953	2094	4047	373	318	3253	3212	6465	422	447
4/18/2018	Wed			49.8	50.2	5172	5221	10393	1918	2099	4017	371	303	3254	3122	6376	396	469
4/19/2018	Thu			49.9	50.1	5339	5351	10690	1974	2148	4122	358	333	3365	3203	6568	428	477
4/20/2018	Fri			50.4	49.6	6068	5969	12037	2349	2220	4569	427	304	3719	3749	7468	492	488
4/21/2018	Sat			47.3	52.7	5845	6511	12356	2667	1872	4539	466	387	3178	4639	7817	348	570
4/22/2018	Sun			49.6	50.4	5954	6053	12007	2353	1617	3970	535	340	3601	4436	8037	573	467
4/23/2018	Mon			49.2	50.8	5546	5720	11266	2178	2225	4403	447	345	3368	3495	6863	466	425
4/24/2018	Tue			49.8	50.2	5377	5416	10793	2088	2222	4310	399	324	3289	3194	6483	463	444
4/25/2018	Wed			49.7	50.3	5544	5609	11153	2159	2279	4438	421	311	3385	3330	6715	420	517
4/26/2018	Thu			49.5	50.5	5312	5424	10736	2147	2281	4428	295	447	3165	3143	6308	419	449
4/27/2018	Fri			50.4	49.6	5867	5783	11650	2462	2460	4922	325	481	3405	3323	6728	438	431
4/28/2018	Sat			50.0	50.0	5684	5688	11372	2090	1741	3831	453	353	3594	3947	7541	438	468
4/29/2018	Sun			49.1	50.9	5588	5787	11375	2283	1587	3870	483	363	3305	4200	7505	511	480
4/30/2018	Mon			49.3	50.7	5327	5478	10805	2099	2195	4294	364	355	3228	3283	6511	426	466

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

May, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
5/1/2018	Tue			50.0	50.0	5661	5670	11331	2318	2307	4625	430	344	3343	3363	6706	431	478
5/2/2018	Wed			49.3	50.7	4890	5022	9912	1796	2107	3903	266	379	3094	2915	6009	431	387
5/3/2018	Thu			49.8	50.2	5039	5073	10112	1814	2155	3969	271	408	3225	2918	6143	396	437
5/4/2018	Fri			50.3	49.7	5380	5324	10704	2038	2077	4115	393	287	3342	3247	6589	439	428
5/5/2018	Sat			50.6	49.4	5935	5796	11731	2400	1805	4205	508	342	3535	3991	7526	375	539
5/6/2018	Sun			49.5	50.5	5826	5935	11761	2326	1578	3904	586	348	3500	4357	7857	552	477
5/7/2018	Mon			50.2	49.8	5374	5331	10705	2056	2185	4241	403	354	3318	3146	6464	460	449
5/8/2018	Tue			49.4	50.6	5354	5481	10835	2126	2245	4371	403	316	3228	3236	6464	401	446
5/9/2018	Wed			49.7	50.3	5516	5584	11100	2194	2156	4350	396	337	3322	3428	6750	461	501
5/10/2018	Thu			50.1	49.9	5728	5709	11437	2367	2201	4568	391	371	3361	3508	6869	450	464
5/11/2018	Fri			50.3	49.7	6209	6123	12332	2559	2297	4856	431	381	3650	3826	7476	418	546
5/12/2018	Sat			50.9	49.1	7114	6876	13990	3198	2099	5297	644	356	3916	4777	8693	630	479
5/13/2018	Sun			49.6	50.4	5644	5742	11386	2265	1570	3835	519	266	3379	4172	7551	578	457
5/14/2018	Mon			50.2	49.8	5502	5465	10967	2226	2189	4415	428	308	3276	3276	6552	428	482
5/15/2018	Tue			49.7	50.3	5460	5524	10984	2115	2207	4322	394	315	3345	3317	6662	437	432
5/16/2018	Wed			49.3	50.7	5565	5724	11289	2247	2273	4520	439	299	3318	3451	6769	405	456
5/17/2018	Thu			49.4	50.6	5649	5785	11434	2163	2134	4297	410	342	3486	3651	7137	431	457
5/18/2018	Fri			51.5	48.5	6598	6215	12813	2757	2230	4987	443	435	3841	3985	7826	518	461
5/19/2018	Sat			50.0	50.0	6377	6385	12762	2647	1917	4564	555	342	3730	4468	8198	611	481
5/20/2018	Sun			49.2	50.8	5900	6094	11994	2431	1635	4066	531	409	3469	4459	7928	488	492
5/21/2018	Mon			49.2	50.8	5293	5470	10763	2163	2168	4331	437	308	3130	3302	6432	427	447
5/22/2018	Tue			49.9	50.1	5606	5638	11244	2296	2204	4500	413	308	3310	3434	6744	425	448
5/23/2018	Wed			49.0	51.0	5480	5694	11174	2193	2235	4428	401	353	3287	3459	6746	408	497
5/24/2018	Thu			49.4	50.6	5807	5957	11764	2300	2331	4631	432	374	3507	3626	7133	442	512
5/25/2018	Fri			50.2	49.8	5749	5698	11447	2364	2107	4471	480	329	3385	3591	6976	438	448
5/26/2018	Sat			51.9	48.1	6478	5996	12474	2771	1774	4545	614	341	3707	4222	7929	558	458
5/27/2018	Sun			50.1	49.9	5753	5730	11483	2413	1578	3991	501	349	3340	4152	7492	455	481
5/28/2018	Mon	*		49.0	51.0	5478	5710	11188	2523	1666	4189	614	380	2955	4044	6999	523	441
5/29/2018	Tue			49.4	50.6	5453	5596	11049	2090	2253	4343	367	385	3363	3343	6706	444	443
5/30/2018	Wed			49.6	50.4	5506	5588	11094	2036	2136	4172	413	323	3470	3452	6922	423	481
5/31/2018	Thu			49.8	50.2	5748	5785	11533	2278	2287	4565	436	372	3470	3498	6968	401	485

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

June, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
6/1/2018	Fri			50.8	49.2	6060	5872	11932	2433	2153	4586	474	320	3627	3719	7346	467	477
6/2/2018	Sat			50.8	49.2	6910	6685	13595	3159	1862	5021	682	357	3751	4823	8574	502	521
6/3/2018	Sun			50.9	49.1	6036	5832	11868	2582	1599	4181	613	318	3454	4233	7687	552	452
6/4/2018	Mon			49.4	50.6	5283	5405	10688	2099	2226	4325	426	339	3184	3179	6363	424	430
6/5/2018	Tue			49.8	50.2	5553	5606	11159	2117	2089	4206	465	326	3436	3517	6953	421	450
6/6/2018	Wed			49.8	50.2	5635	5671	11306	2214	2173	4387	426	380	3421	3498	6919	382	494
6/7/2018	Thu			50.6	49.4	5769	5642	11411	2240	2078	4318	489	305	3529	3564	7093	469	537
6/8/2018	Fri			50.6	49.4	6198	6051	12249	2479	2242	4721	485	347	3719	3809	7528	432	483
6/9/2018	Sat			50.5	49.5	6772	6649	13421	3053	2065	5118	624	447	3719	4584	8303	517	499
6/10/2018	Sun			51.7	48.3	6245	5838	12083	2802	1579	4381	618	351	3443	4259	7702	535	472
6/11/2018	Mon	*		50.6	49.4	6055	5903	11958	2621	1958	4579	561	347	3434	3945	7379	553	430
6/12/2018	Tue			50.1	49.9	5668	5637	11305	2321	2066	4387	454	329	3347	3571	6918	398	518
6/13/2018	Wed			50.5	49.5	5891	5778	11669	2402	2169	4571	476	343	3489	3609	7098	405	513
6/14/2018	Thu			50.9	49.1	5867	5655	11522	2118	2078	4196	413	306	3749	3577	7326	496	462
6/15/2018	Fri			51.5	48.5	6733	6333	13066	2817	2175	4992	534	354	3916	4158	8074	483	537
6/16/2018	Sat			51.2	48.8	7033	6716	13749	3073	1946	5019	647	391	3960	4770	8730	612	454
6/17/2018	Sun			49.6	50.4	6112	6200	12312	2810	1623	4433	587	369	3302	4577	7879	451	603
6/18/2018	Mon			50.7	49.3	6062	5887	11949	2395	2129	4524	500	333	3667	3758	7425	472	495
6/19/2018	Tue			50.0	50.0	6125	6118	12243	2495	2222	4717	500	342	3630	3896	7526	409	566
6/20/2018	Wed			50.1	49.9	6124	6099	12223	2538	2282	4820	479	379	3586	3817	7403	439	521
6/21/2018	Thu			50.8	49.2	6526	6325	12851	2698	2166	4864	560	364	3828	4159	7987	516	459
6/22/2018	Fri			51.4	48.6	6518	6152	12670	2528	2167	4695	499	377	3990	3985	7975	552	484
6/23/2018	Sat			51.3	48.7	6975	6621	13596	3275	2090	5365	615	437	3700	4531	8231	503	542
6/24/2018	Sun			48.9	51.1	5453	5690	11143	2235	1653	3888	481	363	3218	4037	7255	492	439
6/25/2018	Mon			49.9	50.1	5571	5585	11156	2243	2040	4283	495	328	3328	3545	6873	358	565
6/26/2018	Tue			49.7	50.3	5666	5738	11404	2358	2123	4481	487	310	3308	3615	6923	395	489
6/27/2018	Wed			49.7	50.3	5850	5916	11766	2352	2210	4562	481	331	3498	3706	7204	442	499
6/28/2018	Thu			50.0	50.0	5950	5939	11889	2459	2273	4732	477	363	3491	3666	7157	425	473
6/29/2018	Fri			51.5	48.5	6734	6338	13072	2816	2343	5159	490	400	3918	3995	7913	548	497
6/30/2018	Sat			51.5	48.5	6896	6499	13395	2982	1875	4857	643	344	3914	4624	8538	502	474

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

July, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
7/1/2018	Sun			51.4	48.6	6393	6037	12430	2874	1685	4559	632	368	3519	4352	7871	627	435
7/2/2018	Mon			49.8	50.2	6029	6089	12118	2411	2251	4662	514	352	3618	3838	7456	456	523
7/3/2018	Tue			51.1	48.9	6463	6184	12647	2478	2282	4760	492	375	3985	3902	7887	490	517
7/4/2018	Wed	*		51.1	48.9	6422	6136	12558	3488	1380	4868	603	329	2934	4756	7690	541	437
7/5/2018	Thu			50.0	50.0	6355	6363	12718	2469	2125	4594	601	323	3886	4238	8124	510	535
7/6/2018	Fri			51.4	48.6	6744	6365	13109	2643	2298	4941	558	379	4101	4067	8168	546	468
7/7/2018	Sat			51.3	48.7	6528	6204	12732	2805	2059	4864	467	454	3723	4145	7868	447	541
7/8/2018	Sun			50.4	49.6	5900	5796	11696	2436	1707	4143	549	379	3464	4089	7553	594	394
7/9/2018	Mon			49.9	50.1	5789	5820	11609	2257	2179	4436	489	348	3532	3641	7173	433	520
7/10/2018	Tue			50.4	49.6	6006	5922	11928	2475	2154	4629	544	354	3531	3768	7299	452	483
7/11/2018	Wed			49.9	50.1	5858	5880	11738	2291	2218	4509	438	348	3567	3662	7229	426	485
7/12/2018	Thu			51.1	48.9	6071	5819	11890	2523	2170	4693	535	321	3548	3649	7197	507	412
7/13/2018	Fri			51.9	48.1	6491	6024	12515	2606	2289	4895	524	341	3885	3735	7620	480	472
7/14/2018	Sat			50.7	49.3	7239	7049	14288	3189	2034	5223	719	451	4050	5015	9065	594	488
7/15/2018	Sun			49.5	50.5	6339	6459	12798	2843	1757	4600	731	409	3496	4702	8198	553	555
7/16/2018	Mon			50.0	50.0	5839	5830	11669	2400	2134	4534	499	321	3439	3696	7135	427	420
7/17/2018	Tue			50.7	49.3	5949	5786	11735	2505	2176	4681	536	327	3444	3610	7054	436	498
7/18/2018	Wed			50.4	49.6	5629	5543	11172	2268	2131	4399	447	336	3361	3412	6773	453	456
7/19/2018	Thu			50.5	49.5	6082	5965	12047	2616	2112	4728	584	338	3466	3853	7319	428	484
7/20/2018	Fri			51.2	48.8	6614	6300	12914	2774	2334	5108	595	312	3840	3966	7806	510	430
7/21/2018	Sat			50.5	49.5	7036	6898	13934	3134	2093	5227	621	458	3902	4805	8707	493	517
7/22/2018	Sun			51.2	48.8	6201	5916	12117	2744	1729	4473	651	336	3457	4187	7644	448	508
7/23/2018	Mon			50.5	49.5	6098	5976	12074	2433	2192	4625	518	372	3665	3784	7449	497	469
7/24/2018	Tue			51.1	48.9	6279	5999	12278	2529	2247	4776	511	378	3750	3752	7502	497	441
7/25/2018	Wed			50.1	49.9	6023	6001	12024	2480	2226	4706	510	318	3543	3775	7318	412	464
7/26/2018	Thu			49.8	50.2	6266	6317	12583	2599	2380	4979	587	332	3667	3937	7604	481	446
7/27/2018	Fri			50.5	49.5	6599	6469	13068	2673	2388	5061	553	397	3926	4081	8007	523	418
7/28/2018	Sat			50.3	49.7	6748	6665	13413	3137	2068	5205	650	358	3611	4597	8208	482	414
7/29/2018	Sun			51.1	48.9	6172	5906	12078	2751	1632	4383	662	342	3421	4274	7695	519	438
7/30/2018	Mon			49.8	50.2	5643	5688	11331	2282	2083	4365	498	323	3361	3605	6966	401	474
7/31/2018	Tue			49.4	50.6	5716	5848	11564	2396	2144	4540	437	374	3320	3704	7024	429	439

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

August, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
8/1/2018	Wed			50.0	50.0	5762	5773	11535	2254	2181	4435	401	361	3508	3592	7100	441	490
8/2/2018	Thu			50.6	49.4	6046	5899	11945	2519	2211	4730	485	333	3527	3688	7215	419	492
8/3/2018	Fri			50.4	49.6	6192	6083	12275	2601	2297	4898	531	372	3591	3786	7377	459	485
8/4/2018	Sat			51.4	48.6	6306	5964	12270	2662	1708	4370	588	397	3644	4256	7900	556	450
8/5/2018	Sun			50.0	50.0	5622	5625	11247	2443	1675	4118	541	386	3179	3950	7129	538	425
8/6/2018	Mon			50.4	49.6	6019	5934	11953	2443	2185	4628	550	309	3576	3749	7325	537	361
8/7/2018	Tue			49.7	50.3	5844	5909	11753	2414	2301	4715	533	361	3430	3608	7038	390	502
8/8/2018	Wed			50.6	49.4	6068	5931	11999	2570	2331	4901	507	345	3498	3600	7098	404	489
8/9/2018	Thu		3	49.3	50.7	8470	8717	17187	3067	3589	6656	590	640	5403	5128	10531	714	683
8/10/2018	Fri			51.8	48.2	6446	5989	12435	2514	2336	4850	484	321	3932	3653	7585	484	480
8/11/2018	Sat			51.1	48.9	6774	6494	13268	2873	1826	4699	643	352	3901	4668	8569	508	510
8/12/2018	Sun			49.8	50.2	6004	6057	12061	2679	1702	4381	649	350	3325	4355	7680	507	431
8/13/2018	Mon			49.6	50.4	5745	5848	11593	2415	2205	4620	502	331	3330	3643	6973	427	446
8/14/2018	Tue			50.0	50.0	5807	5810	11617	2450	2209	4659	515	308	3357	3601	6958	427	435
8/15/2018	Wed			50.2	49.8	6041	5994	12035	2554	2357	4911	471	338	3487	3637	7124	406	483
8/16/2018	Thu			50.2	49.8	6324	6266	12590	2727	2489	5216	493	336	3597	3777	7374	418	476
8/17/2018	Fri	*		50.4	49.6	5712	5617	11329	2308	1797	4105	461	346	3404	3820	7224	487	431
8/18/2018	Sat			51.1	48.9	6628	6347	12975	2997	1887	4884	639	367	3631	4460	8091	552	429
8/19/2018	Sun			49.4	50.6	5677	5820	11497	2449	1625	4074	518	369	3228	4195	7423	539	381
8/20/2018	Mon			49.9	50.1	5649	5661	11310	2332	2165	4497	454	305	3317	3496	6813	458	434
8/21/2018	Tue			49.4	50.6	5960	6114	12074	2470	2365	4835	484	377	3490	3749	7239	418	493
8/22/2018	Wed		3	49.1	50.9	5275	5458	10733	2279	2292	4571	352	381	2996	3166	6162	370	457
8/23/2018	Thu		3	49.4	50.6	2851	2923	5774	1288	1353	2641	268	225	1563	1570	3133	249	285
8/24/2018	Fri		3	50.5	49.5	1495	1466	2961	567	573	1140	121	124	928	893	1821	124	127
8/25/2018	Sat		3	49.6	50.4	3495	3556	7051	1065	949	2014	298	250	2430	2607	5037	373	324
8/26/2018	Sun		3	50.5	49.5	4346	4257	8603	1534	1225	2759	380	289	2812	3032	5844	408	371
8/27/2018	Mon			49.8	50.2	4684	4722	9406	1768	2116	3884	337	341	2916	2606	5522	373	353
8/28/2018	Tue			48.9	51.1	5004	5223	10227	1909	2217	4126	377	303	3095	3006	6101	388	474
8/29/2018	Wed			49.8	50.2	5305	5343	10648	2145	2198	4343	413	316	3160	3145	6305	392	437
8/30/2018	Thu			50.2	49.8	5490	5438	10928	2248	2146	4394	401	287	3242	3292	6534	414	502
8/31/2018	Fri			50.9	49.1	6046	5841	11887	2343	2169	4512	425	329	3703	3672	7375	446	465

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

September, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
9/1/2018	Sat			51.5	48.5	6561	6181	12742	2953	1892	4845	661	347	3608	4289	7897	545	400
9/2/2018	Sun			50.3	49.7	5919	5852	11771	2510	1562	4072	569	317	3409	4290	7699	486	455
9/3/2018	Mon	*		50.0	50.0	6160	6161	12321	3030	1640	4670	701	363	3130	4521	7651	537	545
9/4/2018	Tue			49.5	50.5	5546	5654	11200	2200	2376	4576	363	439	3346	3278	6624	389	495
9/5/2018	Wed			49.6	50.4	5433	5522	10955	2237	2142	4379	441	290	3196	3380	6576	402	471
9/6/2018	Thu			50.2	49.8	5529	5489	11018	2299	2236	4535	416	310	3230	3253	6483	455	461
9/7/2018	Fri			50.5	49.5	5929	5817	11746	2475	2319	4794	444	324	3454	3498	6952	416	498
9/8/2018	Sat			50.5	49.5	6160	6048	12208	2691	1847	4538	532	395	3469	4201	7670	514	447
9/9/2018	Sun			49.9	50.1	5411	5434	10845	2322	1546	3868	466	310	3089	3888	6977	592	376
9/10/2018	Mon			49.2	50.8	5423	5610	11033	2224	2308	4532	419	332	3199	3302	6501	371	527
9/11/2018	Tue			49.4	50.6	5085	5218	10303	2083	2203	4286	390	334	3002	3015	6017	401	421
9/12/2018	Wed			49.9	50.1	3668	3690	7358	1497	1773	3270	230	326	2171	1917	4088	279	302
9/13/2018	Thu			50.0	50.0	4407	4414	8821	1561	1990	3551	314	273	2846	2424	5270	395	354
9/14/2018	Fri			49.5	50.5	5425	5533	10958	2207	2242	4449	431	301	3218	3291	6509	422	425
9/15/2018	Sat			50.7	49.3	5679	5514	11193	2135	1742	3877	469	364	3544	3772	7316	417	479
9/16/2018	Sun			49.1	50.9	5256	5442	10698	2196	1511	3707	472	287	3060	3931	6991	344	523
9/17/2018	Mon			49.9	50.1	5311	5333	10644	2080	2158	4238	393	265	3231	3175	6406	468	448
9/18/2018	Tue			49.8	50.2	5589	5643	11232	2313	2264	4577	463	290	3276	3379	6655	401	467
9/19/2018	Wed			49.8	50.2	5428	5461	10889	2217	2217	4434	426	283	3211	3244	6455	372	484
9/20/2018	Thu			50.1	49.9	5624	5599	11223	2324	2209	4533	439	311	3300	3390	6690	447	484
9/21/2018	Fri			50.2	49.8	5670	5625	11295	2403	2261	4664	432	314	3267	3364	6631	391	492
9/22/2018	Sat			50.7	49.3	6128	5951	12079	2510	1808	4318	609	404	3618	4143	7761	562	395
9/23/2018	Sun			50.3	49.7	5419	5347	10766	2368	1512	3880	482	341	3051	3835	6886	508	394
9/24/2018	Mon			49.9	50.1	5327	5352	10679	2219	2145	4364	451	272	3108	3207	6315	387	488
9/25/2018	Tue			48.4	51.6	5484	5845	11329	2286	2524	4810	340	447	3198	3321	6519	444	433
9/26/2018	Wed			49.3	50.7	5063	5198	10261	2128	2208	4336	278	410	2935	2990	5925	357	466
9/27/2018	Thu			50.1	49.9	5024	4998	10022	2110	2151	4261	268	429	2914	2847	5761	435	552
9/28/2018	Fri			50.3	49.7	5406	5352	10758	2143	2325	4468	365	335	3263	3027	6290	413	426
9/29/2018	Sat			50.4	49.6	6880	6764	13644	2952	2057	5009	594	403	3928	4707	8635	556	513
9/30/2018	Sun			49.9	50.1	5685	5701	11386	2648	1700	4348	529	346	3037	4001	7038	439	464

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

October, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
10/1/2018	Mon			49.1	50.9	5139	5335	10474	2167	2235	4402	385	361	2972	3100	6072	394	420
10/2/2018	Tue			51.0	49.0	5744	5520	11264	2460	2138	4598	446	318	3284	3382	6666	443	460
10/3/2018	Wed			50.5	49.5	5733	5614	11347	2469	2250	4719	395	382	3264	3364	6628	436	459
10/4/2018	Thu			50.7	49.3	5944	5789	11733	2525	2361	4886	428	370	3419	3428	6847	467	447
10/5/2018	Fri			50.8	49.2	6296	6108	12404	2579	2277	4856	477	330	3717	3831	7548	474	488
10/6/2018	Sat			51.2	48.8	6138	5859	11997	2611	1903	4514	485	398	3527	3956	7483	462	509
10/7/2018	Sun			50.1	49.9	5336	5316	10652	2224	1664	3888	485	339	3112	3652	6764	397	487
10/8/2018	Mon			49.8	50.2	6230	6287	12517	2829	2065	4894	578	361	3401	4222	7623	452	560
10/9/2018	Tue			49.9	50.1	5991	6006	11997	2594	2202	4796	529	363	3397	3804	7201	463	532
10/10/2018	Wed			49.9	50.1	5515	5545	11060	2335	2182	4517	425	357	3180	3363	6543	387	514
10/11/2018	Thu			50.4	49.6	5565	5482	11047	2457	2209	4666	463	340	3108	3273	6381	380	495
10/12/2018	Fri		3	50.6	49.4	5419	5300	10719	2256	2075	4331	438	310	3163	3225	6388	407	460
10/13/2018	Sat		3	51.3	48.7	5738	5437	11175	2219	1772	3991	472	353	3519	3665	7184	439	470
10/14/2018	Sun			49.9	50.1	5221	5244	10465	2132	1526	3658	507	274	3089	3718	6807	346	546
10/15/2018	Mon			49.5	50.5	5185	5298	10483	2079	2174	4253	384	304	3106	3124	6230	412	479
10/16/2018	Tue			49.8	50.2	5326	5375	10701	2128	2146	4274	419	292	3198	3229	6427	454	452
10/17/2018	Wed			50.1	49.9	5517	5505	11022	2202	2206	4408	338	367	3315	3299	6614	447	492
10/18/2018	Thu			48.9	51.1	5389	5631	11020	2287	2285	4572	314	438	3102	3346	6448	435	457
10/19/2018	Fri			50.0	50.0	5912	5908	11820	2285	2187	4472	428	319	3627	3721	7348	432	480
10/20/2018	Sat			50.5	49.5	6222	6095	12317	2581	1968	4549	540	375	3641	4127	7768	436	490
10/21/2018	Sun			49.5	50.5	5294	5410	10704	2132	1589	3721	465	330	3162	3821	6983	516	445
10/22/2018	Mon			49.1	50.9	5253	5435	10688	2068	2175	4243	382	311	3185	3260	6445	412	499
10/23/2018	Tue			48.8	51.2	5335	5605	10940	2151	2242	4393	392	350	3184	3363	6547	407	519
10/24/2018	Wed			50.2	49.8	5539	5503	11042	2354	2239	4593	387	327	3185	3264	6449	450	466
10/25/2018	Thu			49.8	50.2	5465	5509	10974	2231	2242	4473	399	325	3234	3267	6501	467	434
10/26/2018	Fri			49.8	50.2	5536	5583	11119	2032	2134	4166	412	283	3504	3449	6953	436	501
10/27/2018	Sat			51.0	49.0	5991	5747	11738	2302	1740	4042	471	343	3689	4007	7696	474	490
10/28/2018	Sun		3	50.3	49.7	4983	4922	9905	2232	1519	3751	457	327	2751	3403	6154	459	384
10/29/2018	Mon			49.6	50.4	5288	5376	10664	2160	2260	4420	395	331	3128	3116	6244	414	472
10/30/2018	Tue		3	49.7	50.3	4451	4509	8960	1713	2129	3842	234	401	2738	2380	5118	350	365
10/31/2018	Wed		3	49.2	50.8	4927	5097	10024	2056	2102	4158	362	300	2871	2995	5866	429	445

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

November, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
11/1/2018	Thu			50.3	49.7	5507	5447	10954	2401	2239	4640	401	362	3106	3208	6314	417	489
11/2/2018	Fri			50.2	49.8	5513	5480	10993	2154	2174	4328	363	345	3359	3306	6665	476	463
11/3/2018	Sat			49.8	50.2	5618	5669	11287	2200	1807	4007	447	348	3418	3862	7280	466	491
11/4/2018	Sun			49.6	50.4	4804	4890	9694	1905	1539	3444	379	349	2899	3351	6250	423	406
11/5/2018	Mon			49.8	50.2	5412	5461	10873	2197	2190	4387	410	303	3215	3271	6486	430	433
11/6/2018	Tue	*		50.0	50.0	5673	5675	11348	2377	2068	4445	472	366	3296	3607	6903	429	491
11/7/2018	Wed			49.9	50.1	5662	5687	11349	2354	2247	4601	362	393	3308	3440	6748	422	481
11/8/2018	Thu			50.2	49.8	5968	5916	11884	2565	2344	4909	434	357	3403	3572	6975	442	514
11/9/2018	Fri			51.4	48.6	6503	6147	12650	2655	2506	5161	450	482	3848	3641	7489	565	540
11/10/2018	Sat			51.3	48.7	5824	5534	11358	2194	1755	3949	472	353	3630	3779	7409	496	509
11/11/2018	Sun			50.2	49.8	5086	5050	10136	2012	1454	3466	464	309	3074	3596	6670	481	415
11/12/2018	Mon	*	3	51.0	49.0	6224	5988	12212	2761	1874	4635	637	384	3463	4114	7577	542	554
11/13/2018	Tue			50.0	50.0	5585	5580	11165	2237	2227	4464	389	335	3348	3353	6701	472	455
11/14/2018	Wed			50.2	49.8	5454	5409	10863	2303	2283	4586	296	475	3151	3126	6277	390	484
11/15/2018	Thu			50.2	49.8	5514	5470	10984	2287	2177	4464	410	320	3227	3293	6520	465	468
11/16/2018	Fri			50.9	49.1	5461	5268	10729	2158	2130	4288	387	300	3303	3138	6441	422	468
11/17/2018	Sat			51.7	48.3	5448	5094	10542	2087	1605	3692	445	312	3361	3489	6850	379	499
11/18/2018	Sun			49.6	50.4	5051	5140	10191	2123	1525	3648	466	313	2928	3615	6543	379	514
11/19/2018	Mon			49.7	50.3	5500	5559	11059	2165	2187	4352	424	309	3335	3372	6707	467	495
11/20/2018	Tue			50.5	49.5	5736	5632	11368	2349	2236	4585	485	348	3387	3396	6783	420	498
11/21/2018	Wed			49.3	50.7	5526	5680	11206	2263	2191	4454	456	341	3263	3489	6752	366	490
11/22/2018	Thu	*		49.6	50.4	4362	4438	8800	1681	1276	2957	377	345	2681	3162	5843	290	416
11/23/2018	Fri		3	50.5	49.5	5367	5266	10633	2139	1728	3867	495	308	3228	3538	6766	467	365
11/24/2018	Sat		3	51.0	49.0	5985	5761	11746	2450	1741	4191	605	352	3535	4020	7555	466	510
11/25/2018	Sun			51.4	48.6	5854	5539	11393	2817	1519	4336	592	328	3037	4020	7057	470	494
11/26/2018	Mon			50.8	49.2	5821	5628	11449	2577	2186	4763	517	327	3244	3442	6686	430	459
11/27/2018	Tue			50.4	49.6	5469	5376	10845	2300	2201	4501	422	320	3169	3175	6344	455	445
11/28/2018	Wed			50.8	49.2	5548	5376	10924	2379	2116	4495	399	306	3169	3260	6429	458	459
11/29/2018	Thu			50.3	49.7	5972	5893	11865	2606	2329	4935	407	379	3366	3564	6930	468	505
11/30/2018	Fri			50.2	49.8	5141	5091	10232	2058	2180	4238	353	333	3083	2911	5994	403	509

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

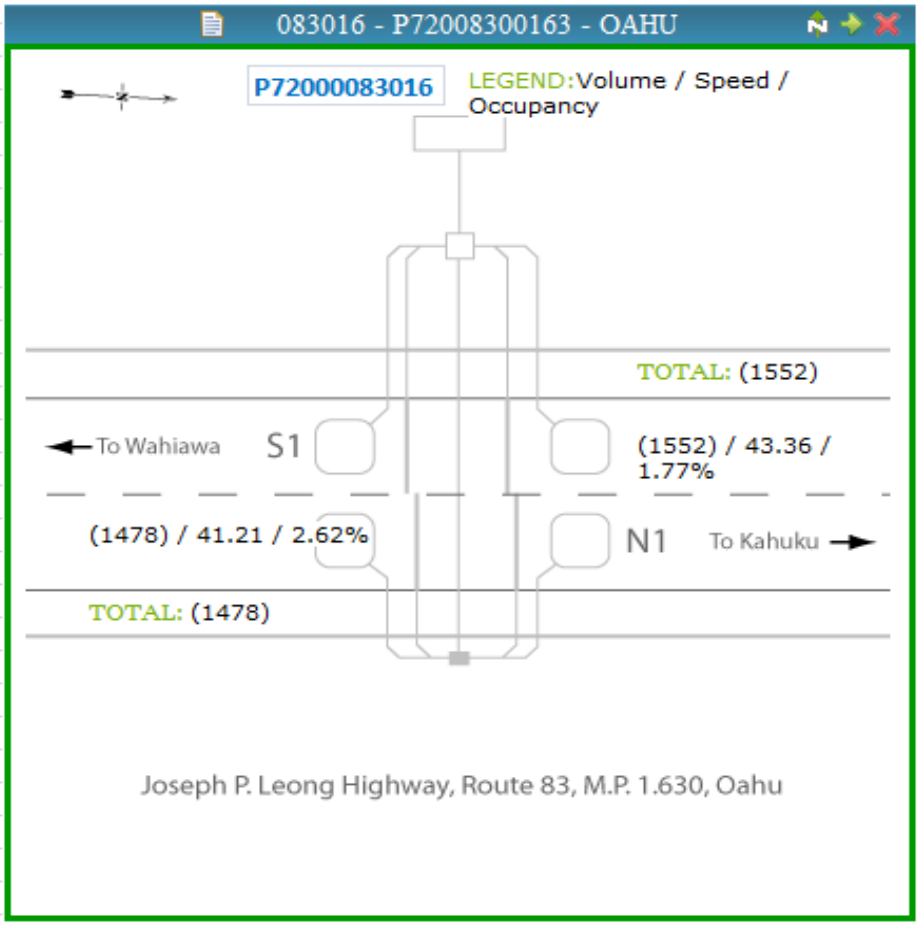
December, 2018

STATION NO 083016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
12/1/2018	Sat			52.6	47.4	6103	5505	11608	2456	1771	4227	513	361	3647	3734	7381	430	522
12/2/2018	Sun			50.5	49.5	5407	5302	10709	2342	1582	3924	444	360	3065	3720	6785	430	476
12/3/2018	Mon			50.4	49.6	5584	5499	11083	2217	2227	4444	405	307	3367	3272	6639	458	481
12/4/2018	Tue			50.1	49.9	5672	5643	11315	2307	2189	4496	449	337	3365	3454	6819	488	462
12/5/2018	Wed			51.1	48.9	6410	6141	12551	2738	2108	4846	562	317	3672	4033	7705	501	597
12/6/2018	Thu			51.1	48.9	5895	5648	11543	2547	2179	4726	497	315	3348	3469	6817	493	441
12/7/2018	Fri			50.5	49.5	5866	5749	11615	2243	2331	4574	450	339	3623	3418	7041	419	540
12/8/2018	Sat			51.4	48.6	5726	5405	11131	2263	1854	4117	396	362	3463	3551	7014	352	502
12/9/2018	Sun			51.2	48.8	5167	4918	10085	2096	1573	3669	442	310	3071	3345	6416	337	602
12/10/2018	Mon			49.6	50.4	5205	5283	10488	2004	2278	4282	393	330	3201	3005	6206	388	521
12/11/2018	Tue			49.8	50.2	5275	5326	10601	2028	2180	4208	380	358	3247	3146	6393	471	455
12/12/2018	Wed			50.3	49.7	5674	5601	11275	2515	2245	4760	454	356	3159	3356	6515	435	530
12/13/2018	Thu			50.6	49.4	5809	5681	11490	2407	2162	4569	425	342	3402	3519	6921	473	514
12/14/2018	Fri			50.6	49.4	6609	6458	13067	2387	2144	4531	427	330	4222	4314	8536	587	718
12/15/2018	Sat			51.7	48.3	6257	5840	12097	2571	1839	4410	500	352	3686	4001	7687	448	550
12/16/2018	Sun			52.1	47.9	6050	5572	11622	3058	1456	4514	614	272	2992	4116	7108	186	722
12/17/2018	Mon			50.6	49.4	6164	6017	12181	2949	2155	5104	545	327	3215	3862	7077	411	574
12/18/2018	Tue			50.7	49.3	5758	5608	11366	2341	2310	4651	474	357	3417	3298	6715	438	500
12/19/2018	Wed			50.1	49.9	5555	5522	11077	2067	2245	4312	396	335	3488	3277	6765	431	481
12/20/2018	Thu			51.0	49.0	5999	5770	11769	2366	2214	4580	480	405	3633	3556	7189	429	568
12/21/2018	Fri			50.8	49.2	6315	6125	12440	2485	2240	4725	489	355	3830	3885	7715	504	494
12/22/2018	Sat			51.6	48.4	6372	5965	12337	2740	1842	4582	617	386	3632	4123	7755	558	417
12/23/2018	Sun			50.7	49.3	5913	5759	11672	2555	1634	4189	525	374	3358	4125	7483	459	506
12/24/2018	Mon			51.6	48.4	5733	5378	11111	2390	1841	4231	538	394	3343	3537	6880	502	514
12/25/2018	Tue	*		50.7	49.3	4502	4385	8887	1691	1018	2709	474	249	2811	3367	6178	372	432
12/26/2018	Wed		3	51.7	48.3	6546	6126	12672	2793	2039	4832	632	390	3753	4087	7840	490	546
12/27/2018	Thu		3	50.8	49.2	6457	6243	12700	2807	2055	4862	594	389	3650	4188	7838	497	519
12/28/2018	Fri			51.4	48.6	5696	5388	11084	2199	2240	4439	430	504	3497	3148	6645	426	494
12/29/2018	Sat		3	51.0	49.0	5951	5709	11660	2264	1734	3998	563	458	3687	3975	7662	486	524
12/30/2018	Sun		3	51.7	48.3	6242	5821	12063	2862	1725	4587	637	392	3380	4096	7476	455	530
12/31/2018	Mon		3	50.8	49.2	5632	5460	11092	2400	1882	4282	549	395	3232	3578	6810	481	473

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR


083016 - P72008300163 - OAHU
P72000083016
LEGEND: Volume / Speed / Occupancy
TOTAL: (1552)
To Wahiawa
S1
(1552) / 43.36 / 1.77%
(1478) / 41.21 / 2.62%
N1
To Kahuku
TOTAL: (1478)
Joseph P. Leong Highway, Route 83, M.P. 1.630, Oahu

STATION: ####
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2019 - 2019
LOC'N 21.598398 -158.099586

Oahu
DIRECTION 01 (D1): Northbound, MOV 1
DIRECTION 02 (D2): Southbound, MOV 5

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	10931	11213	11244	11409	11867	11926	10953	11333	11363	1.01355	1.01628
February	10899	11117	11138	11491	11762	11539	11607	11281	11365	1.01344	1.02093
March	11279	11249	11382	12005	11845	12569	11213	11552	11649	0.98872	0.99701
April	11261	11542	11318	11866	12066	12182	10566	11611	11543	0.99779	0.99197
May	11114	11469	11234	11769	12229	12255	11706	11563	11682	0.98589	0.99605
June	11108	10896	11548	11973	12211	13873	11756	11547	11909	0.96710	0.99743
July	11360	11758	11773	12189	12218	13019	12438	11860	12108	0.95124	0.97115
August	11318	11598	11396	11695	12162	12705	11540	11634	11773	0.97826	0.99000
September	10118	10827	10600	10966	11421	11731	11338	10786	11000	1.04703	1.06778
October	10934	10833	10602	10876	12088	11924	10844	11066	11157	1.03229	1.04075
November	11139	11135	11104	11104	11490	11624	10486	11194	11155	1.03253	1.02886
December	11215	11615	11645	12047	12080	11195	10735	11720	11505	1.00111	0.98268
AVERAGE	11056	11271	11249	11616	11953	12212	11265	AVERAGE 11429	D1+D2 AADT 11517		

K-FACTOR 9.09%
K-FACTOR PERIOD AM
D-FACTOR 60.17%

STATION: ####
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2019 - 2019
LOC'N 21.598398 -158.099586
Oahu
DIRECTION 01 (D1): Northbound, MOV 1

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	5426	5564	5667	5730	6015	6064	5440	5680	5701	1.01371	1.01736
February	5434	5575	5576	5687	5868	5863	5728	5628	5676	1.01819	1.02686
March	5605	5576	5704	6037	6031	6400	5545	5790	5842	0.98914	0.99803
April	5610	5777	5632	5987	6132	6191	5260	5828	5799	0.99662	0.99165
May	5516	5720	5596	5908	6263	6198	5848	5801	5864	0.98544	0.99622
June	5543	5446	5817	5964	6256	7189	5964	5805	6025	0.95909	0.99552
July	5635	5849	5906	6068	6184	6494	6202	5928	6048	0.95550	0.97482
August	5632	5764	5684	5842	6180	6348	5729	5820	5883	0.98237	0.99288
September	5040	5384	5255	5501	5807	5931	5666	5397	5512	1.04847	1.07071
October	5453	5404	5291	5435	6121	5954	5391	5541	5578	1.03598	1.04300
November	5601	5575	5552	5537	5852	5923	5227	5623	5609	1.03024	1.02769
December	5586	5865	5886	6216	6117	5617	5384	5934	5810	0.99465	0.97389
AVERAGE	5507	5625	5630	5826	6069	6181	5615	AVERAGE 5731	D1 AADT 5779		

STATION: ####
STATION DESCRIPTION: 083016 Joseph P. Leong Highway, Route 83, MP 1.63
YEAR: 2019 - 2019
LOC'N 21.598398 -158.099586
Oahu
DIRECTION 02 (D2): Southbound, MOV 5

MONTH	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKDAY AVERAGE	MONTHLY AVERAGE	AADT MON AVE	AADT AVE WKDY
January	5505	5649	5577	5679	5852	5862	5513	5653	5663	1.01339	1.01520
February	5465	5542	5562	5804	5894	5676	5879	5654	5689	1.00871	1.01502
March	5674	5673	5678	5968	5815	6168	5668	5762	5806	0.98831	0.99598
April	5650	5766	5686	5879	5934	5990	5305	5783	5744	0.99897	0.99230
May	5598	5749	5638	5861	5966	6057	5858	5762	5818	0.98633	0.99588
June	5565	5451	5731	6009	5955	6684	5792	5742	5884	0.97530	0.99936
July	5725	5909	5868	6122	6033	6525	6237	5931	6060	0.94698	0.96747
August	5686	5835	5712	5853	5982	6357	5811	5813	5891	0.97415	0.98711
September	5078	5442	5345	5465	5614	5801	5673	5389	5488	1.04557	1.06485
October	5481	5430	5311	5441	5967	5971	5453	5526	5579	1.02860	1.03849
November	5539	5560	5552	5567	5638	5702	5259	5571	5545	1.03485	1.03004
December	5629	5750	5759	5831	5963	5578	5351	5787	5695	1.00771	0.99169
AVERAGE	5550	5646	5618	5790	5884	6031	5650	AVERAGE 5698	D2 AADT 5738		

January, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
1/1/2019	Tue	*		49.4	50.6	5035	5149	10184	1875	1242	3117	502	276	3160	3907	7067	472	479
1/2/2019	Wed			50.9	49.1	6347	6111	12458	2648	2104	4752	558	355	3699	4007	7706	508	541
1/3/2019	Thu			50.8	49.2	6286	6097	12383	2634	2099	4733	541	411	3652	3998	7650	512	527
1/4/2019	Fri			50.7	49.3	6199	6021	12220	2501	2044	4545	540	376	3698	3977	7675	421	567
1/5/2019	Sat			50.4	49.6	6170	6062	12232	2662	1871	4533	563	397	3508	4191	7699	507	469
1/6/2019	Sun			48.9	51.1	5422	5666	11088	2372	1573	3945	540	346	3050	4093	7143	437	485
1/7/2019	Mon			49.7	50.3	5634	5704	11338	2228	2114	4342	484	337	3406	3590	6996	406	465
1/8/2019	Tue			49.5	50.5	5807	5932	11739	2340	2150	4490	485	326	3467	3782	7249	499	531
1/9/2019	Wed			50.1	49.9	5691	5660	11351	2431	2233	4664	480	350	3260	3427	6687	447	490
1/10/2019	Thu			50.5	49.5	6037	5909	11946	2592	2266	4858	475	340	3445	3643	7088	507	498
1/11/2019	Fri			50.5	49.5	6245	6115	12360	2610	2275	4885	472	359	3635	3840	7475	458	534
1/12/2019	Sat			51.7	48.3	6384	5958	12342	2695	1828	4523	578	377	3689	4130	7819	503	520
1/13/2019	Sun			50.0	50.0	5329	5335	10664	2470	1508	3978	565	346	2859	3827	6686	448	463
1/14/2019	Mon			49.8	50.2	5454	5493	10947	2231	2113	4344	438	277	3223	3380	6603	434	507
1/15/2019	Tue			49.5	50.5	5540	5653	11193	2302	2155	4457	436	295	3238	3498	6736	458	515
1/16/2019	Wed			50.3	49.7	5517	5442	10959	2325	2137	4462	432	322	3192	3305	6497	429	446
1/17/2019	Thu			50.0	50.0	5492	5499	10991	2209	2224	4433	416	320	3283	3275	6558	408	628
1/18/2019	Fri			50.5	49.5	5971	5856	11827	2174	2086	4260	392	344	3797	3770	7567	507	517
1/19/2019	Sat		3	51.1	48.9	6269	6005	12274	2701	1842	4543	588	362	3568	4163	7731	506	477
1/20/2019	Sun			50.5	49.5	5960	5851	11811	2732	1617	4349	603	336	3228	4234	7462	402	520
1/21/2019	Mon	*	3	50.5	49.5	6198	6080	12278	2705	1833	4538	628	374	3493	4247	7740	439	552
1/22/2019	Tue			49.3	50.7	5788	5956	11744	2474	2356	4830	412	449	3314	3600	6914	457	501
1/23/2019	Wed			51.0	49.0	5824	5588	11412	2521	2203	4724	459	305	3303	3385	6688	399	520
1/24/2019	Thu			50.3	49.7	5872	5794	11666	2527	2282	4809	448	365	3345	3512	6857	469	525
1/25/2019	Fri			51.0	49.0	5645	5417	11062	2371	2137	4508	447	296	3274	3280	6554	396	586
1/26/2019	Sat			50.3	49.7	5638	5567	11205	2305	1748	4053	498	389	3333	3819	7152	374	523
1/27/2019	Sun			49.3	50.7	5049	5201	10250	2071	1576	3647	493	356	2978	3625	6603	414	446
1/28/2019	Mon			49.4	50.6	5191	5317	10508	2031	2119	4150	408	306	3160	3198	6358	416	529
1/29/2019	Tue			50.3	49.7	5119	5056	10175	2107	2129	4236	400	293	3012	2927	5939	378	507
1/30/2019	Wed			49.3	50.7	4954	5086	10040	1884	2165	4049	335	338	3070	2921	5991	387	449
1/31/2019	Thu			49.3	50.7	4965	5096	10061	1894	2245	4139	357	335	3071	2851	5922	413	462

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

February, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1

DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
2/1/2019	Fri		3	50.4	49.6	5387	5295	10682	1930	2132	4062	364	314	3457	3163	6620	435	451
2/2/2019	Sat		3	50.6	49.4	5300	5165	10465	1920	1672	3592	394	363	3380	3493	6873	468	417
2/3/2019	Sun		3	50.7	49.3	4744	4614	9358	2016	1346	3362	440	284	2728	3268	5996	458	395
2/4/2019	Mon			50.0	50.0	5732	5731	11463	2363	2060	4423	489	310	3369	3671	7040	435	516
2/5/2019	Tue			50.5	49.5	5922	5795	11717	2540	2264	4804	479	336	3382	3531	6913	443	477
2/6/2019	Wed			50.1	49.9	5576	5556	11132	2364	2294	4658	389	353	3212	3262	6474	409	587
2/7/2019	Thu			49.8	50.2	5727	5773	11500	2293	2261	4554	386	345	3434	3512	6946	460	484
2/8/2019	Fri			50.2	49.8	6048	5988	12036	2334	2318	4652	427	381	3714	3670	7384	421	519
2/9/2019	Sat			50.6	49.4	5876	5744	11620	2247	1848	4095	533	393	3629	3896	7525	438	540
2/10/2019	Sun		3	52.8	47.2	5112	4564	9676	1812	1348	3160	457	320	3300	3216	6516	558	429
2/11/2019	Mon			49.6	50.4	5017	5089	10106	1918	1960	3878	362	351	3099	3129	6228	392	473
2/12/2019	Tue			49.3	50.7	5211	5355	10566	2041	2175	4216	296	384	3170	3180	6350	418	456
2/13/2019	Wed			49.9	50.1	5245	5256	10501	1987	2156	4143	359	320	3258	3100	6358	410	435
2/14/2019	Thu		3	49.7	50.3	4795	4861	9656	1693	2103	3796	305	365	3102	2758	5860	372	394
2/15/2019	Fri			49.3	50.7	5520	5669	11189	2066	2256	4322	448	374	3454	3413	6867	478	507
2/16/2019	Sat			51.0	49.0	5624	5413	11037	2053	1728	3781	454	380	3571	3685	7256	474	423
2/17/2019	Sun		3	50.6	49.4	4962	4852	9814	1838	1511	3349	441	322	3124	3341	6465	431	453
2/18/2019	Mon	*	3	50.5	49.5	5829	5716	11545	2343	1754	4097	628	400	3486	3962	7448	578	433
2/19/2019	Tue			51.4	48.6	5621	5305	10926	2047	2200	4247	412	360	3574	3105	6679	552	419
2/20/2019	Wed			50.0	50.0	5836	5828	11664	2320	2202	4522	466	327	3516	3626	7142	432	529
2/21/2019	Thu			48.6	51.4	5615	5939	11554	2164	2221	4385	340	423	3451	3718	7169	438	486
2/22/2019	Fri			50.0	50.0	6035	6025	12060	2374	2244	4618	486	403	3661	3781	7442	467	465
2/23/2019	Sat			50.9	49.1	6089	5870	11959	2473	1796	4269	559	319	3616	4074	7690	545	406
2/24/2019	Sun			49.3	50.7	5728	5879	11607	2487	1580	4067	609	387	3241	4299	7540	389	566
2/25/2019	Mon			49.9	50.1	5552	5576	11128	2194	2192	4386	418	335	3358	3384	6742	427	482
2/26/2019	Tue			49.2	50.8	5545	5714	11259	2164	2195	4359	492	318	3381	3519	6900	422	512
2/27/2019	Wed			50.2	49.8	5645	5608	11253	2203	2312	4515	413	363	3442	3296	6738	434	505
2/28/2019	Thu			50.1	49.9	5720	5700	11420	2249	2300	4549	435	347	3471	3400	6871	406	503

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

March, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
3/1/2019	Fri			50.0	50.0	5740	5736	11476	2227	2152	4379	431	301	3513	3584	7097	421	495
3/2/2019	Sat			51.0	49.0	7050	6761	13811	2969	1920	4889	681	386	4081	4841	8922	450	533
3/3/2019	Sun		3	49.3	50.7	7917	8135	16052	3785	3187	6972	879	814	4132	4948	9080	877	872
3/4/2019	Mon			49.4	50.6	5340	5470	10810	2125	2156	4281	445	323	3215	3314	6529	457	519
3/5/2019	Tue			48.7	51.3	5147	5411	10558	1862	2156	4018	370	324	3285	3255	6540	385	505
3/6/2019	Wed			48.9	51.1	5222	5449	10671	1983	2284	4267	345	356	3239	3165	6404	411	469
3/7/2019	Thu			51.0	49.0	5871	5648	11519	2461	2289	4750	484	338	3410	3359	6769	447	465
3/8/2019	Fri			50.3	49.7	5747	5671	11418	2163	2202	4365	437	337	3584	3469	7053	430	476
3/9/2019	Sat			50.5	49.5	5811	5687	11498	2244	1827	4071	525	348	3567	3860	7427	474	452
3/10/2019	Sun		3	49.9	50.1	4733	4748	9481	1975	1435	3410	492	312	2758	3313	6071	403	462
3/11/2019	Mon			49.2	50.8	5353	5522	10875	2095	2132	4227	400	305	3258	3390	6648	439	508
3/12/2019	Tue			49.8	50.2	5501	5542	11043	2264	2269	4533	369	386	3237	3273	6510	434	459
3/13/2019	Wed			50.7	49.3	5743	5588	11331	2344	2284	4628	416	347	3399	3304	6703	482	497
3/14/2019	Thu			50.7	49.3	6166	5998	12164	2567	2242	4809	482	322	3599	3756	7355	480	480
3/15/2019	Fri			51.5	48.5	6539	6150	12689	2692	2312	5004	528	351	3847	3838	7685	490	494
3/16/2019	Sat			51.6	48.4	6898	6462	13360	3095	1932	5027	666	410	3803	4530	8333	596	436
3/17/2019	Sun			49.0	51.0	5969	6222	12191	2461	2164	4625	543	361	3508	4058	7566	594	447
3/18/2019	Mon			50.7	49.3	6077	5918	11995	2538	2165	4703	568	377	3539	3753	7292	457	517
3/19/2019	Tue			50.1	49.9	6081	6065	12146	2450	2149	4599	477	377	3631	3916	7547	514	518
3/20/2019	Wed			50.2	49.8	6118	6073	12191	2612	2253	4865	521	352	3506	3820	7326	507	528
3/21/2019	Thu			49.7	50.3	6276	6360	12636	2713	2211	4924	590	357	3563	4149	7712	469	517
3/22/2019	Fri			51.8	48.2	6368	5935	12303	2513	2121	4634	547	352	3855	3814	7669	469	505
3/23/2019	Sat			50.2	49.8	5686	5650	11336	2304	1848	4152	542	369	3382	3802	7184	498	397
3/24/2019	Sun			50.3	49.7	5519	5448	10967	2389	1551	3940	544	322	3130	3897	7027	465	429
3/25/2019	Mon			49.4	50.6	5649	5787	11436	2212	2244	4456	433	353	3437	3543	6980	482	464
3/26/2019	Tue	*		50.6	49.4	6183	6027	12210	2872	2084	4956	571	365	3311	3943	7254	460	461
3/27/2019	Wed			50.6	49.4	5731	5603	11334	2390	2201	4591	472	321	3341	3402	6743	430	496
3/28/2019	Thu			49.9	50.1	5833	5866	11699	2524	2306	4830	429	420	3309	3560	6869	433	486
3/29/2019	Fri			50.8	49.2	5760	5581	11341	2299	2209	4508	443	356	3461	3372	6833	399	492
3/30/2019	Sat			51.1	48.9	6556	6282	12838	2831	1888	4719	583	388	3725	4394	8119	567	453
3/31/2019	Sun			49.1	50.9	5147	5334	10481	2157	1581	3738	572	317	2990	3753	6743	300	627

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

April, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
4/1/2019	Mon			49.6	50.4	5503	5592	11095	2261	2203	4464	362	370	3242	3389	6631	457	425
4/2/2019	Tue			50.1	49.9	5617	5587	11204	2273	2199	4472	457	322	3344	3388	6732	407	483
4/3/2019	Wed			50.0	50.0	5687	5681	11368	2233	2265	4498	414	304	3454	3416	6870	478	463
4/4/2019	Thu			50.1	49.9	6026	5992	12018	2584	2351	4935	488	348	3442	3641	7083	444	484
4/5/2019	Fri			51.0	49.0	6449	6203	12652	2674	2398	5072	492	381	3775	3805	7580	479	504
4/6/2019	Sat			50.6	49.4	6493	6334	12827	2747	1905	4652	560	374	3746	4429	8175	549	473
4/7/2019	Sun			51.0	49.0	5717	5503	11220	2606	1702	4308	566	365	3111	3801	6912	496	409
4/8/2019	Mon			49.9	50.1	5903	5924	11827	2636	2303	4939	453	342	3267	3621	6888	425	514
4/9/2019	Tue			50.3	49.7	6068	6000	12068	2612	2299	4911	453	374	3456	3701	7157	461	483
4/10/2019	Wed			50.0	50.0	5654	5650	11304	2381	2236	4617	433	311	3273	3414	6687	443	483
4/11/2019	Thu			50.5	49.5	5953	5828	11781	2556	2227	4783	364	396	3397	3601	6998	447	462
4/12/2019	Fri			51.0	49.0	5955	5728	11683	2362	2265	4627	460	352	3593	3463	7056	455	469
4/13/2019	Sat			51.1	48.9	6117	5848	11965	2570	1842	4412	589	342	3547	4006	7553	473	485
4/14/2019	Sun			49.2	50.8	5143	5302	10445	2129	1683	3812	468	397	3014	3619	6633	458	449
4/15/2019	Mon			50.2	49.8	5630	5594	11224	2234	2226	4460	369	377	3396	3368	6764	466	483
4/16/2019	Tue			50.4	49.6	6077	5972	12049	2648	2318	4966	482	371	3429	3654	7083	493	474
4/17/2019	Wed			49.2	50.8	5610	5803	11413	2205	2335	4540	291	442	3405	3468	6873	459	470
4/18/2019	Thu			50.3	49.7	6061	5991	12052	2397	2334	4731	441	333	3664	3657	7321	449	466
4/19/2019	Fri	*		50.9	49.1	6573	6339	12912	2952	2149	5101	623	386	3621	4190	7811	463	531
4/20/2019	Sat			51.0	49.0	6331	6089	12420	2895	2008	4903	562	420	3436	4081	7517	500	473
4/21/2019	Sun	*		49.7	50.3	5362	5419	10781	2329	1385	3714	557	295	3033	4034	7067	483	388
4/22/2019	Mon			49.5	50.5	5576	5683	11259	2255	2219	4474	450	356	3321	3464	6785	433	466
4/23/2019	Tue			49.4	50.6	5479	5617	11096	2281	2202	4483	456	288	3198	3415	6613	366	488
4/24/2019	Wed			49.9	50.1	5578	5608	11186	2234	2191	4425	374	322	3344	3417	6761	410	478
4/25/2019	Thu			50.9	49.1	5907	5705	11612	2547	2299	4846	438	366	3360	3406	6766	426	495
4/26/2019	Fri			50.5	49.5	5992	5872	11864	2469	2423	4892	368	416	3523	3449	6972	435	487
4/27/2019	Sat			50.6	49.4	5824	5690	11514	2533	1857	4390	559	400	3291	3833	7124	430	464
4/28/2019	Sun			49.1	50.9	4921	5111	10032	2185	1520	3705	458	326	2736	3591	6327	440	441
4/29/2019	Mon			49.9	50.1	5440	5459	10899	2375	2263	4638	446	333	3065	3196	6261	410	439
4/30/2019	Tue			50.0	50.0	5643	5652	11295	2360	2200	4560	402	359	3283	3452	6735	443	486

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

May, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
5/1/2019	Wed			49.8	50.2	5449	5497	10946	2113	2213	4326	382	328	3336	3284	6620	431	472
5/2/2019	Thu			50.5	49.5	5540	5429	10969	2316	2181	4497	407	313	3224	3248	6472	453	445
5/3/2019	Fri			51.0	49.0	6111	5882	11993	2464	2300	4764	469	343	3647	3582	7229	424	460
5/4/2019	Sat			50.2	49.8	5275	5231	10506	1680	1830	3510	328	333	3595	3401	6996	483	405
5/5/2019	Sun			49.3	50.7	5521	5679	11200	2227	1659	3886	537	328	3294	4020	7314	507	411
5/6/2019	Mon			49.7	50.3	5557	5618	11175	2222	2186	4408	427	322	3335	3432	6767	473	452
5/7/2019	Tue			49.7	50.3	5618	5694	11312	2304	2189	4493	451	315	3314	3505	6819	451	422
5/8/2019	Wed			50.1	49.9	5587	5566	11153	2251	2207	4458	382	349	3336	3359	6695	446	479
5/9/2019	Thu			49.9	50.1	5965	5985	11950	2434	2292	4726	457	327	3531	3693	7224	453	493
5/10/2019	Fri			50.8	49.2	6320	6110	12430	2561	2299	4860	509	358	3759	3811	7570	504	495
5/11/2019	Sat			50.2	49.8	6562	6520	13082	2663	2043	4706	586	413	3899	4477	8376	513	469
5/12/2019	Sun			49.8	50.2	5785	5824	11609	2489	1671	4160	622	366	3296	4153	7449	489	495
5/13/2019	Mon			49.3	50.7	5519	5665	11184	2217	2284	4501	464	331	3302	3381	6683	441	404
5/14/2019	Tue			49.9	50.1	5767	5781	11548	2311	2236	4547	472	326	3456	3545	7001	413	483
5/15/2019	Wed			49.7	50.3	5469	5534	11003	2198	2140	4338	424	283	3271	3394	6665	391	467
5/16/2019	Thu			49.8	50.2	5820	5859	11679	2323	2219	4542	459	295	3497	3640	7137	457	488
5/17/2019	Fri			50.8	49.2	5989	5795	11784	2378	2160	4538	386	367	3611	3635	7246	461	467
5/18/2019	Sat			50.8	49.2	6316	6110	12426	2657	1920	4577	525	399	3659	4190	7849	467	478
5/19/2019	Sun			50.0	50.0	5705	5700	11405	2512	1648	4160	551	362	3193	4052	7245	520	432
5/20/2019	Mon			49.8	50.2	5473	5510	10983	2191	2099	4290	429	295	3282	3411	6693	418	474
5/21/2019	Tue			49.9	50.1	5796	5829	11625	2347	2136	4483	455	263	3449	3693	7142	414	498
5/22/2019	Wed			49.8	50.2	5697	5748	11445	2234	2210	4444	452	278	3463	3538	7001	423	488
5/23/2019	Thu			49.8	50.2	5904	5958	11862	2305	2303	4608	475	298	3599	3655	7254	500	442
5/24/2019	Fri			51.3	48.7	6224	5903	12127	2359	2175	4534	493	358	3865	3728	7593	496	446
5/25/2019	Sat			51.1	48.9	6639	6365	13004	2903	1952	4855	630	417	3736	4413	8149	451	487
5/26/2019	Sun			50.6	49.4	6381	6230	12611	2864	1702	4566	607	333	3517	4528	8045	442	521
5/27/2019	Mon	*		49.0	51.0	6199	6456	12655	3080	1816	4896	707	377	3119	4640	7759	478	536
5/28/2019	Tue			50.0	50.0	5700	5690	11390	2349	2235	4584	486	338	3351	3455	6806	401	475
5/29/2019	Wed			49.7	50.3	5780	5844	11624	2303	2278	4581	444	342	3477	3566	7043	429	460
5/30/2019	Thu			51.0	49.0	6313	6074	12387	2528	2322	4850	510	368	3785	3752	7537	482	451
5/31/2019	Fri			52.1	47.9	6671	6139	12810	2633	2309	4942	516	326	4038	3830	7868	481	507

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

June, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63 DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
6/1/2019	Sat		3	50.1	49.9	6735	6700	13435	2994	2026	5020	654	367	3741	4674	8415	347	688
6/2/2019	Sun			50.9	49.1	5964	5762	11726	2538	1733	4271	514	388	3426	4029	7455	536	395
6/3/2019	Mon			49.6	50.4	5380	5473	10853	2404	1824	4228	514	348	2976	3649	6625	484	398
6/4/2019	Tue			50.2	49.8	5965	5909	11874	2394	2226	4620	531	350	3571	3683	7254	439	446
6/5/2019	Wed			49.7	50.3	5819	5881	11700	2371	2210	4581	454	296	3448	3671	7119	432	483
6/6/2019	Thu			48.0	52.0	5893	6379	12272	2403	2532	4935	480	442	3490	3847	7337	530	445
6/7/2019	Fri			51.0	49.0	6221	5982	12203	2500	2115	4615	516	340	3721	3867	7588	447	489
6/8/2019	Sat			51.8	48.2	7199	6691	13890	3254	2016	5270	665	441	3945	4675	8620	486	500
6/9/2019	Sun			50.6	49.4	6059	5917	11976	2849	1658	4507	630	348	3210	4259	7469	517	428
6/10/2019	Mon			50.2	49.8	5932	5879	11811	2536	2190	4726	478	377	3396	3689	7085	419	477
6/11/2019	Tue	*	3	49.9	50.1	6046	6060	12106	2713	2005	4718	628	359	3333	4055	7388	422	473
6/12/2019	Wed			50.8	49.2	6353	6143	12496	2661	2299	4960	435	379	3692	3844	7536	427	519
6/13/2019	Thu			50.4	49.6	5987	5900	11887	2525	2125	4650	559	312	3462	3775	7237	436	470
6/14/2019	Fri			50.7	49.3	6348	6180	12528	2573	2150	4723	506	338	3775	4030	7805	444	577
6/15/2019	Sat			51.9	48.1	6967	6451	13418	3182	2025	5207	616	369	3785	4426	8211	570	431
6/16/2019	Sun			50.9	49.1	6174	5955	12129	2733	1664	4397	645	353	3441	4291	7732	497	460
6/17/2019	Mon			50.0	50.0	5536	5527	11063	2265	2055	4320	482	327	3271	3472	6743	366	499
6/18/2019	Tue		3	49.8	50.2	4315	4351	8666	2466	2142	4608	539	309	1849	2209	4058	320	549
6/19/2019	Wed			50.5	49.5	5957	5833	11790	2535	2200	4735	496	292	3422	3633	7055	434	423
6/20/2019	Thu			50.8	49.2	6293	6095	12388	2610	2252	4862	501	346	3683	3843	7526	461	492
6/21/2019	Fri			51.9	48.1	6195	5742	11937	2634	2243	4877	506	370	3561	3499	7060	525	474
6/22/2019	Sat			51.7	48.3	7402	6910	14312	3582	2165	5747	655	514	3820	4745	8565	414	633
6/23/2019	Sun			50.7	49.3	5817	5659	11476	2619	1634	4253	620	361	3198	4025	7223	425	570
6/24/2019	Mon			49.7	50.3	5324	5382	10706	2110	2097	4207	411	351	3214	3285	6499	419	426
6/25/2019	Tue			49.7	50.3	4926	4992	9918	1913	1968	3881	388	307	3013	3024	6037	340	463
6/26/2019	Wed			50.3	49.7	5137	5067	10204	1940	2034	3974	378	317	3197	3033	6230	404	424
6/27/2019	Thu			50.1	49.9	5682	5663	11345	2295	2132	4427	468	340	3387	3531	6918	405	474
6/28/2019	Fri			51.4	48.6	6260	5914	12174	2508	2117	4625	517	331	3752	3797	7549	448	487
6/29/2019	Sat		3	49.7	50.3	6441	6509	12950	2810	1929	4739	612	396	3631	4580	8211	499	480
6/30/2019	Sun			50.6	49.4	5808	5665	11473	2664	1849	4513	634	449	3144	3816	6960	524	462

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

July, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
7/1/2019	Mon			49.9	50.1	5921	5934	11855	2347	2151	4498	536	329	3574	3783	7357	413	483
7/2/2019	Tue		3	50.6	49.4	6049	5916	11965	2554	2148	4702	553	339	3495	3768	7263	485	434
7/3/2019	Wed		3	51.5	48.5	6360	5988	12348	2633	2156	4789	548	342	3727	3832	7559	439	470
7/4/2019	Thu	*	3	50.8	49.2	5973	5777	11750	3300	1464	4764	601	312	2673	4313	6986	521	378
7/5/2019	Fri		3	50.2	49.8	6217	6171	12388	2643	2085	4728	605	379	3574	4086	7660	432	462
7/6/2019	Sat		3	49.9	50.1	6787	6809	13596	3240	2061	5301	620	430	3547	4748	8295	435	511
7/7/2019	Sun		3	51.1	48.9	6208	5944	12152	2821	1653	4474	667	360	3387	4291	7678	546	427
7/8/2019	Mon			49.7	50.3	5475	5550	11025	2208	2245	4453	465	336	3267	3305	6572	448	414
7/9/2019	Tue			49.6	50.4	5805	5904	11709	2327	2163	4490	507	343	3478	3741	7219	433	499
7/10/2019	Wed			50.5	49.5	5822	5705	11527	2395	2126	4521	473	320	3427	3579	7006	410	454
7/11/2019	Thu			49.7	50.3	6071	6147	12218	2393	2199	4592	429	341	3678	3948	7626	439	506
7/12/2019	Fri			50.7	49.3	6272	6098	12370	2559	2156	4715	525	366	3713	3942	7655	462	472
7/13/2019	Sat		3	50.0	50.0	6914	6927	13841	3205	2117	5322	785	478	3709	4810	8519	424	573
7/14/2019	Sun			49.9	50.1	6762	6795	13557	3238	1890	5128	738	431	3524	4905	8429	580	494
7/15/2019	Mon		3	50.4	49.6	5907	5823	11730	2346	2124	4470	498	360	3561	3699	7260	450	422
7/16/2019	Tue			50.0	50.0	5987	5996	11983	2402	2123	4525	497	308	3585	3873	7458	437	473
7/17/2019	Wed			50.1	49.9	5889	5874	11763	2475	2153	4628	495	342	3414	3721	7135	434	512
7/18/2019	Thu		3	49.4	50.6	5837	5990	11827	2522	2186	4708	542	349	3315	3804	7119	434	429
7/19/2019	Fri			50.6	49.4	6211	6067	12278	2502	2179	4681	524	304	3709	3888	7597	531	378
7/20/2019	Sat			50.2	49.8	6790	6746	13536	3228	2040	5268	671	461	3562	4706	8268	550	484
7/21/2019	Sun			49.6	50.4	5809	5911	11720	2650	1654	4304	673	348	3159	4257	7416	471	434
7/22/2019	Mon			49.4	50.6	5486	5620	11106	2329	2116	4445	511	301	3157	3504	6661	429	460
7/23/2019	Tue		3	49.0	51.0	5651	5875	11526	2470	2084	4554	532	305	3181	3791	6972	392	430
7/24/2019	Wed			50.0	50.0	5967	5973	11940	2631	2202	4833	567	318	3336	3771	7107	392	477
7/25/2019	Thu			49.9	50.1	6064	6096	12160	2620	2177	4797	556	328	3444	3919	7363	327	515
7/26/2019	Fri			50.6	49.4	6070	5935	12005	2644	2194	4838	568	338	3426	3741	7167	392	462
7/27/2019	Sat			49.6	50.4	6198	6303	12501	3003	1907	4910	621	423	3195	4396	7591	413	464
7/28/2019	Sun			50.1	49.9	6034	6004	12038	2754	1608	4362	584	360	3280	4396	7676	558	448
7/29/2019	Mon			49.4	50.6	5657	5795	11452	2358	2034	4392	548	337	3299	3761	7060	394	478
7/30/2019	Tue			49.7	50.3	5755	5828	11583	2548	2159	4707	553	329	3207	3669	6876	428	414
7/31/2019	Wed			50.1	49.9	5944	5919	11863	2458	2218	4676	511	314	3486	3701	7187	409	453

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

August, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
8/1/2019	Thu			50.3	49.7	5767	5699	11466	2673	2223	4896	548	318	3094	3476	6570	419	457
8/2/2019	Fri			50.6	49.4	6038	5896	11934	2426	2167	4593	468	374	3612	3729	7341	427	474
8/3/2019	Sat			51.2	48.8	6430	6129	12559	2882	1865	4747	561	400	3548	4264	7812	520	444
8/4/2019	Sun			49.3	50.7	5354	5497	10851	2411	1668	4079	528	354	2943	3829	6772	441	496
8/5/2019	Mon			49.8	50.2	5573	5611	11184	2320	2142	4462	524	330	3253	3469	6722	408	415
8/6/2019	Tue			49.5	50.5	5615	5729	11344	2341	2218	4559	425	365	3274	3511	6785	396	448
8/7/2019	Wed			50.0	50.0	5669	5674	11343	2356	2210	4566	492	325	3313	3464	6777	376	589
8/8/2019	Thu			50.3	49.7	6036	5967	12003	2699	2197	4896	541	342	3337	3770	7107	399	473
8/9/2019	Fri			50.5	49.5	6321	6207	12528	2871	2359	5230	514	382	3450	3848	7298	457	432
8/10/2019	Sat		3	49.4	50.6	6190	6331	12521	2840	1942	4782	650	403	3350	4389	7739	443	464
8/11/2019	Sun			49.2	50.8	5731	5920	11651	2677	1688	4365	601	344	3054	4232	7286	420	453
8/12/2019	Mon			50.3	49.7	5896	5824	11720	2617	2276	4893	490	322	3279	3548	6827	370	448
8/13/2019	Tue			50.1	49.9	5983	5964	11947	2645	2148	4793	537	284	3338	3816	7154	384	491
8/14/2019	Wed			49.8	50.2	5929	5969	11898	2657	2334	4991	468	397	3272	3635	6907	385	433
8/15/2019	Thu			49.5	50.5	5954	6081	12035	2632	2220	4852	480	351	3322	3861	7183	431	458
8/16/2019	Fri	*		51.6	48.4	6837	6406	13243	2866	2125	4991	596	372	3971	4281	8252	530	415
8/17/2019	Sat			49.9	50.1	6426	6464	12890	3041	2080	5121	638	378	3385	4384	7769	517	403
8/18/2019	Sun			49.7	50.3	5945	6018	11963	2651	1643	4294	530	337	3294	4375	7669	524	421
8/19/2019	Mon			49.1	50.9	5582	5781	11363	2319	2188	4507	468	303	3263	3593	6856	396	472
8/20/2019	Tue			50.1	49.9	5985	5963	11948	2527	2219	4746	520	322	3458	3744	7202	456	417
8/21/2019	Wed			50.0	50.0	5690	5680	11370	2375	2239	4614	433	309	3315	3441	6756	409	467
8/22/2019	Thu			49.8	50.2	5952	5989	11941	2417	2210	4627	434	334	3535	3779	7314	439	532
8/23/2019	Fri			51.2	48.8	6336	6039	12375	2605	2340	4945	492	323	3731	3699	7430	458	493
8/24/2019	Sat			48.9	51.1	6188	6479	12667	2889	1969	4858	586	361	3299	4510	7809	442	456
8/25/2019	Sun			50.3	49.7	5885	5808	11693	2716	1627	4343	590	338	3169	4181	7350	447	472
8/26/2019	Mon			49.8	50.2	5478	5526	11004	2327	2140	4467	505	302	3151	3386	6537	386	501
8/27/2019	Tue			49.1	50.9	5472	5682	11154	2323	2213	4536	419	280	3149	3469	6618	379	497
8/28/2019	Wed			49.6	50.4	5447	5524	10971	2326	2277	4603	417	294	3121	3247	6368	411	441
8/29/2019	Thu			49.9	50.1	5503	5527	11030	2320	2298	4618	406	349	3183	3229	6412	422	475
8/30/2019	Fri			51.0	49.0	6025	5787	11812	2426	2221	4647	485	355	3599	3566	7165	416	468
8/31/2019	Sat		3	49.4	50.6	6279	6439	12718	2847	1835	4682	666	364	3432	4604	8036	194	756

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

September, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
9/1/2019	Sun			50.9	49.1	6158	5946	12104	2726	1676	4402	565	299	3432	4270	7702	528	390
9/2/2019	Mon	*		47.6	52.4	5797	6383	12180	3071	1766	4837	661	335	2726	4617	7343	415	553
9/3/2019	Tue			49.8	50.2	5742	5794	11536	2392	2207	4599	436	315	3350	3587	6937	438	469
9/4/2019	Wed			49.8	50.2	5697	5732	11429	2410	2262	4672	442	339	3287	3470	6757	439	440
9/5/2019	Thu			50.5	49.5	5708	5589	11297	2394	2200	4594	448	284	3314	3389	6703	429	426
9/6/2019	Fri			51.2	48.8	5703	5431	11134	2285	2188	4473	432	301	3418	3243	6661	377	475
9/7/2019	Sat			50.8	49.2	5956	5764	11720	2485	1856	4341	493	405	3471	3908	7379	453	450
9/8/2019	Sun		3	48.6	51.4	4678	4942	9620	2014	1526	3540	422	294	2664	3416	6080	292	480
9/9/2019	Mon			49.7	50.3	5095	5160	10255	2050	2028	4078	384	276	3045	3132	6177	418	447
9/10/2019	Tue			49.6	50.4	5239	5320	10559	2132	2092	4224	403	274	3107	3228	6335	449	497
9/11/2019	Wed			49.4	50.6	5247	5365	10612	2120	2161	4281	395	311	3127	3204	6331	426	412
9/12/2019	Thu			49.9	50.1	5404	5434	10838	2243	2087	4330	408	317	3161	3347	6508	419	453
9/13/2019	Fri			50.8	49.2	5765	5593	11358	2315	2181	4496	419	325	3450	3412	6862	388	467
9/14/2019	Sat			50.8	49.2	5797	5618	11415	2578	1831	4409	533	360	3219	3787	7006	531	395
9/15/2019	Sun			48.8	51.2	5828	6123	11951	2381	1948	4329	534	415	3447	4175	7622	555	454
9/16/2019	Mon			50.1	49.9	5123	5109	10232	2143	2058	4201	403	282	2980	3051	6031	379	472
9/17/2019	Tue			49.6	50.4	5238	5313	10551	2162	2146	4308	406	320	3076	3167	6243	429	449
9/18/2019	Wed			49.9	50.1	5234	5248	10482	2119	2065	4184	371	312	3115	3183	6298	433	441
9/19/2019	Thu			50.2	49.8	5651	5613	11264	2345	2126	4471	430	296	3306	3487	6793	397	482
9/20/2019	Fri			50.6	49.4	5803	5668	11471	2256	2205	4461	462	303	3547	3463	7010	421	475
9/21/2019	Sat			50.5	49.5	5859	5733	11592	2496	1834	4330	546	340	3363	3899	7262	452	416
9/22/2019	Sun			49.9	50.1	5374	5386	10760	2398	1611	4009	473	336	2976	3775	6751	434	454
9/23/2019	Mon			49.7	50.3	4902	4966	9868	2193	2104	4297	395	304	2709	2862	5571	347	432
9/24/2019	Tue			49.9	50.1	5318	5342	10660	2235	2025	4260	411	284	3083	3317	6400	387	488
9/25/2019	Wed			49.0	51.0	4842	5035	9877	2072	2192	4264	273	426	2770	2843	5613	360	478
9/26/2019	Thu			50.1	49.9	5239	5224	10463	2195	2068	4263	393	298	3044	3156	6200	393	448
9/27/2019	Fri			50.8	49.2	5956	5765	11721	2423	2202	4625	420	336	3533	3563	7096	473	430
9/28/2019	Sat			50.1	49.9	6110	6087	12197	2459	2117	4576	462	407	3651	3970	7621	448	528
9/29/2019	Sun			50.3	49.7	5302	5236	10538	2294	1479	3773	502	319	3008	3757	6765	433	434
9/30/2019	Mon		3	49.3	50.7	4776	4909	9685	1902	1891	3793	380	269	2874	3018	5892	399	427

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

October, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	D-02	D-01	D-02	1+2	D-01	D-02	1+2	D-01	D-02	D-01	D-02	1+2	D-01	D-02
10/1/2019	Tue			49.5	50.5	5237	5341	10578	2122	1992	4114	384	314	3115	3349	6464	446	454
10/2/2019	Wed			49.9	50.1	5119	5130	10249	2019	2079	4098	322	320	3100	3051	6151	428	464
10/3/2019	Thu			50.0	50.0	5052	5044	10096	2002	1845	3847	291	325	3050	3199	6249	401	433
10/4/2019	Fri			50.0	50.0	5492	5502	10994	2068	2035	4103	392	333	3424	3467	6891	426	466
10/5/2019	Sat			50.1	49.9	5632	5613	11245	2254	1896	4150	499	357	3378	3717	7095	409	459
10/6/2019	Sun			50.3	49.7	5778	5705	11483	2615	1627	4242	536	363	3163	4078	7241	399	522
10/7/2019	Mon			50.7	49.3	5599	5443	11042	2479	2102	4581	432	402	3120	3341	6461	431	476
10/8/2019	Tue			50.4	49.6	5878	5781	11659	2737	2223	4960	491	359	3141	3558	6699	444	447
10/9/2019	Wed			49.7	50.3	5520	5576	11096	2401	2160	4561	451	339	3119	3416	6535	435	489
10/10/2019	Thu			49.5	50.5	5363	5481	10844	2200	2121	4321	407	336	3163	3360	6523	394	501
10/11/2019	Fri		3	49.4	50.6	4814	4928	9742	1649	1847	3496	370	269	3165	3081	6246	383	498
10/12/2019	Sat			49.9	50.1	5656	5689	11345	2302	1768	4070	505	340	3354	3921	7275	451	438
10/13/2019	Sun			49.3	50.7	5025	5170	10195	2110	1577	3687	483	327	2915	3593	6508	412	425
10/14/2019	Mon			49.6	50.4	5313	5401	10714	2281	1935	4216	479	317	3032	3466	6498	415	471
10/15/2019	Tue			49.3	50.7	4996	5132	10128	2027	1975	4002	362	307	2969	3157	6126	387	448
10/16/2019	Wed			49.8	50.2	5057	5096	10153	1997	2155	4152	324	327	3060	2941	6001	391	440
10/17/2019	Thu			50.6	49.4	5691	5555	11246	2380	2165	4545	401	327	3311	3390	6701	447	459
10/18/2019	Fri			50.0	50.0	6060	6063	12123	2482	2422	4904	379	405	3578	3641	7219	490	450
10/19/2019	Sat			49.4	50.6	6067	6215	12282	2716	2008	4724	520	415	3351	4207	7558	436	487
10/20/2019	Sun			49.4	50.6	5035	5161	10196	2210	1688	3898	446	349	2825	3473	6298	395	433
10/21/2019	Mon			48.7	51.3	5203	5482	10685	2188	2225	4413	432	305	3015	3257	6272	434	486
10/22/2019	Tue			49.4	50.6	5399	5540	10939	2349	2231	4580	320	402	3050	3309	6359	389	483
10/23/2019	Wed			49.6	50.4	5412	5503	10915	2194	2167	4361	363	307	3218	3336	6554	452	489
10/24/2019	Thu			50.2	49.8	5805	5767	11572	2479	2296	4775	404	351	3326	3471	6797	418	477
10/25/2019	Fri			51.8	48.2	6811	6335	13146	2895	2411	5306	494	358	3916	3924	7840	528	547
10/26/2019	Sat			50.4	49.6	6459	6365	12824	3049	1985	5034	575	388	3410	4380	7790	401	549
10/27/2019	Sun			49.8	50.2	5725	5775	11500	2736	1866	4602	510	402	2989	3909	6898	369	502
10/28/2019	Mon			50.4	49.6	5697	5597	11294	2431	2187	4618	465	295	3266	3410	6676	437	466
10/29/2019	Tue			50.7	49.3	5508	5355	10863	2391	2148	4539	400	319	3117	3207	6324	399	429
10/30/2019	Wed			50.5	49.5	5346	5249	10595	2314	2215	4529	390	309	3032	3034	6066	385	439
10/31/2019	Thu			49.6	50.4	5265	5356	10621	2342	2234	4576	405	347	2923	3122	6045	444	387

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

November, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
11/1/2019	Fri			51.7	48.3	6000	5596	11596	2452	2123	4575	450	359	3548	3473	7021	501	471
11/2/2019	Sat			51.1	48.9	6222	5958	12180	2813	1952	4765	544	384	3409	4006	7415	523	444
11/3/2019	Sun			49.7	50.3	4912	4971	9883	2154	1458	3612	442	281	2758	3513	6271	331	595
11/4/2019	Mon			49.9	50.1	5402	5414	10816	2270	2222	4492	367	351	3132	3192	6324	423	483
11/5/2019	Tue			50.5	49.5	5618	5504	11122	2451	2277	4728	460	308	3167	3227	6394	440	422
11/6/2019	Wed			50.1	49.9	5484	5460	10944	2254	2259	4513	392	317	3230	3201	6431	450	441
11/7/2019	Thu			49.8	50.2	5535	5586	11121	2338	2262	4600	410	303	3197	3324	6521	445	463
11/8/2019	Fri			50.6	49.4	6039	5893	11932	2437	2241	4678	442	360	3602	3652	7254	437	505
11/9/2019	Sat			50.6	49.4	5963	5821	11784	2548	1725	4273	526	388	3415	4096	7511	503	441
11/10/2019	Sun			50.3	49.7	5882	5814	11696	2673	1672	4345	627	345	3209	4142	7351	546	431
11/11/2019	Mon	*		49.8	50.2	5863	5908	11771	2811	1873	4684	585	373	3052	4035	7087	559	438
11/12/2019	Tue			49.9	50.1	5631	5654	11285	2436	2227	4663	439	348	3195	3427	6622	468	488
11/13/2019	Wed			48.3	51.7	4957	5306	10263	1961	2099	4060	326	307	2996	3207	6203	426	459
11/14/2019	Thu			49.9	50.1	5824	5837	11661	2538	2263	4801	453	335	3286	3574	6860	485	507
11/15/2019	Fri			51.0	49.0	6073	5838	11911	2591	2174	4765	465	327	3482	3664	7146	470	489
11/16/2019	Sat			51.0	49.0	6140	5903	12043	2733	1890	4623	522	397	3407	4013	7420	425	487
11/17/2019	Sun			49.3	50.7	4854	4986	9840	2094	1574	3668	404	368	2760	3412	6172	409	513
11/18/2019	Mon			50.1	49.9	5480	5455	10935	2219	2238	4457	405	307	3261	3217	6478	473	474
11/19/2019	Tue			49.6	50.4	5141	5217	10358	2183	2121	4304	320	388	2958	3096	6054	376	459
11/20/2019	Wed			50.5	49.5	5593	5490	11083	2386	2155	4541	381	328	3207	3335	6542	413	496
11/21/2019	Thu			49.9	50.1	5252	5278	10530	2141	2112	4253	306	382	3111	3166	6277	432	476
11/22/2019	Fri			50.6	49.4	5558	5419	10977	2199	2091	4290	397	332	3359	3328	6687	416	531
11/23/2019	Sat			51.2	48.8	5453	5188	10641	2244	1791	4035	472	365	3209	3397	6606	449	468
11/24/2019	Sun			50.0	50.0	5259	5266	10525	2291	1501	3792	474	326	2968	3765	6733	532	418
11/25/2019	Mon			50.7	49.3	5920	5747	11667	2536	2195	4731	470	329	3384	3552	6936	482	518
11/26/2019	Tue			50.2	49.8	5908	5865	11773	2552	2306	4858	496	361	3356	3559	6915	463	453
11/27/2019	Wed			50.9	49.1	6175	5951	12126	2751	2282	5033	482	384	3424	3669	7093	511	445
11/28/2019	Thu	*		50.1	49.9	5125	5110	10235	2356	1555	3911	454	359	2769	3555	6324	399	393
11/29/2019	Fri			50.7	49.3	5589	5443	11032	2442	1802	4244	516	355	3147	3641	6788	486	405
11/30/2019	Sat			50.9	49.1	5835	5638	11473	2316	1706	4022	535	367	3519	3932	7451	490	481

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

December, 2019

STATION NO 83016 STATION DESCRIPTION 083016 Joseph P. Leong Highway, Route 83, MP 1.63

DIRECTION 01 Northbound, MOV 1
DIRECTION 02 Southbound, MOV 5

Oahu

Date	Day of Week	H / WD	Unsuccessful Polling	24-HOUR TOTAL					A.M. TOTAL					P.M. TOTAL				
				%		Volume			00:00 - 12:00			PEAK HOUR		12:00-24:00			PEAK HOUR	
				D-01	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**	**D-01**	**D-02**	**1+2**	**D-01**	**D-02**
12/1/2019	Sun			51.0	49.0	4902	4702	9604	2029	1451	3480	442	319	2873	3251	6124	445	383
12/2/2019	Mon			50.0	50.0	5382	5376	10758	2254	2105	4359	412	317	3128	3271	6399	438	454
12/3/2019	Tue			50.2	49.8	5710	5672	11382	2356	2176	4532	443	318	3354	3496	6850	470	481
12/4/2019	Wed			49.9	50.1	5532	5560	11092	2281	2118	4399	331	366	3251	3442	6693	453	480
12/5/2019	Thu			50.9	49.1	5675	5468	11143	2358	2050	4408	416	304	3317	3418	6735	436	491
12/6/2019	Fri			50.1	49.9	6060	6040	12100	2400	2367	4767	431	370	3660	3673	7333	469	441
12/7/2019	Sat			50.8	49.2	6211	6023	12234	2736	1914	4650	556	375	3475	4109	7584	444	480
12/8/2019	Sun			50.8	49.2	5698	5527	11225	2455	1594	4049	461	347	3243	3933	7176	401	515
12/9/2019	Mon			49.8	50.2	5751	5801	11552	2476	2104	4580	461	317	3275	3697	6972	461	509
12/10/2019	Tue			50.9	49.1	6141	5935	12076	2746	2194	4940	501	328	3395	3741	7136	445	567
12/11/2019	Wed			51.2	48.8	6245	5948	12193	2950	2234	5184	547	346	3295	3714	7009	431	528
12/12/2019	Thu			50.8	49.2	5873	5679	11552	2597	2148	4745	467	291	3276	3531	6807	436	564
12/13/2019	Fri			51.2	48.8	6412	6120	12532	2481	2097	4578	417	357	3931	4023	7954	445	571
12/14/2019	Sat			50.4	49.6	5632	5552	11184	2189	1958	4147	410	403	3443	3594	7037	469	435
12/15/2019	Sun			50.3	49.7	5610	5540	11150	2406	1684	4090	479	353	3204	3856	7060	520	419
12/16/2019	Mon			49.6	50.4	5624	5710	11334	2205	2342	4547	436	332	3419	3368	6787	468	505
12/17/2019	Tue			51.3	48.7	5943	5640	11583	2750	2165	4915	480	330	3193	3475	6668	413	539
12/18/2019	Wed			50.5	49.5	5880	5770	11650	2424	2203	4627	422	317	3456	3567	7023	489	519
12/19/2019	Thu			52.8	47.2	7100	6347	13447	3626	2116	5742	651	318	3474	4231	7705	401	542
12/20/2019	Fri			50.6	49.4	5878	5730	11608	2401	2284	4685	415	394	3477	3446	6923	440	505
12/21/2019	Sat			49.6	50.4	4903	4978	9881	1792	1722	3514	458	375	3111	3256	6367	411	413
12/22/2019	Sun			49.7	50.3	5066	5126	10192	2030	1539	3569	441	339	3036	3587	6623	379	492
12/23/2019	Mon		3	49.1	50.9	5763	5968	11731	2424	2179	4603	530	356	3339	3789	7128	400	547
12/24/2019	Tue			49.3	50.7	5525	5690	11215	2483	1876	4359	563	383	3042	3814	6856	421	467
12/25/2019	Wed	*		51.0	49.0	3497	3355	6852	1363	1032	2395	283	265	2134	2323	4457	282	334
12/26/2019	Thu		3	50.0	50.0	5732	5721	11453	2515	1868	4383	591	364	3217	3853	7070	408	488
12/27/2019	Fri		3	50.4	49.6	5835	5741	11576	2504	2075	4579	542	372	3331	3666	6997	414	458
12/28/2019	Sat			49.8	50.2	5723	5758	11481	2596	1732	4328	536	376	3127	4026	7153	219	729
12/29/2019	Sun			49.0	51.0	5642	5862	11504	2733	1640	4373	628	358	2909	4222	7131	172	770
12/30/2019	Mon		3	49.4	50.6	5838	5970	11808	2694	2097	4791	624	338	3144	3873	7017	206	690
12/31/2019	Tue			50.8	49.2	6008	5811	11819	3105	2016	5121	608	392	2903	3795	6698	450	440

1 - INCOMPLETE FILE
2 - DIRECTIONAL SPLIT
3 - USER DEFINED ERROR

APPENDIX B

TRAFFIC COUNT DATA

Ewa Convenience Center

Austin Tsutsumi & Associates

501 Sumner Street, Suite 521
Honolulu, HI 96817-5031
Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : Honouliuli Convenience Center - Geiger Rd
Site Code : 20-219 Leeward Baseyard relocation
Start Date : 8/25/2020
Page No : 1

Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	HONOULIULI CONVENIENCE CENTER Southbound				GEIGER RD Westbound				Northbound				GEIGER RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
06:00 AM	0	0	1	0	0	73	1	0	0	0	0	0	0	60	0	0	135
06:15 AM	0	0	0	0	0	110	0	0	0	0	0	0	0	58	0	0	168
06:30 AM	0	0	0	0	0	133	0	0	0	0	0	0	0	77	0	0	210
06:45 AM	0	0	0	0	0	112	0	0	0	0	0	0	1	52	0	0	165
Total	0	0	1	0	0	428	1	0	0	0	0	0	1	247	0	0	678
07:00 AM	1	0	3	0	0	116	12	0	0	0	0	0	0	59	0	0	191
07:15 AM	4	0	10	0	0	123	6	0	0	0	0	0	5	62	0	0	210
07:30 AM	3	0	6	0	0	133	3	0	0	0	0	0	5	77	0	0	227
07:45 AM	6	0	3	0	0	123	5	0	0	0	0	0	3	61	0	0	201
Total	14	0	22	0	0	495	26	0	0	0	0	0	13	259	0	0	829
08:00 AM	1	0	5	0	0	105	2	0	0	0	0	0	2	55	0	0	170
08:15 AM	6	0	2	0	0	97	5	0	0	0	0	0	3	50	0	0	163
08:30 AM	4	0	4	0	0	92	6	0	0	0	0	0	3	64	0	0	173
08:45 AM	3	0	5	0	0	93	7	0	0	0	0	0	5	66	0	0	179
Total	14	0	16	0	0	387	20	0	0	0	0	0	13	235	0	0	685
09:00 AM	4	0	7	0	0	75	9	0	0	0	0	0	2	70	0	0	167
09:15 AM	5	0	6	0	0	89	4	0	0	0	0	0	7	57	0	0	168
09:30 AM	3	0	4	0	0	75	8	0	0	0	0	0	3	70	0	0	163
09:45 AM	5	0	7	0	0	90	6	0	0	0	0	0	5	62	0	0	175
Total	17	0	24	0	0	329	27	0	0	0	0	0	17	259	0	0	673
10:00 AM	3	0	3	0	0	82	9	0	0	0	0	0	3	74	0	0	174
10:15 AM	12	0	8	0	0	83	10	0	0	0	0	0	1	98	0	0	212
10:30 AM	9	0	4	0	0	86	9	0	0	0	0	0	3	96	0	0	207
10:45 AM	10	0	2	0	0	98	8	0	0	0	0	0	5	80	0	0	203
Total	34	0	17	0	0	349	36	0	0	0	0	0	12	348	0	0	796
11:00 AM	4	0	3	7	0	83	0	0	0	0	0	0	0	93	0	0	190
11:15 AM	1	0	0	0	0	86	0	0	0	0	0	0	2	87	0	0	176
11:30 AM	3	0	4	0	0	75	15	0	0	0	0	0	1	87	0	0	185
11:45 AM	6	0	4	0	0	99	13	0	0	0	0	0	1	108	0	0	231
Total	14	0	11	7	0	343	28	0	0	0	0	0	4	375	0	0	782
12:00 PM	9	0	1	0	0	94	9	0	0	0	0	0	0	105	0	0	218
12:15 PM	5	0	6	0	0	69	4	0	0	0	0	0	5	98	0	0	187
12:30 PM	9	0	4	0	0	89	9	0	0	0	0	0	3	120	0	0	234
12:45 PM	7	0	7	0	0	95	9	1	0	0	0	0	3	129	0	0	251
Total	30	0	18	0	0	347	31	1	0	0	0	0	11	452	0	0	890
01:00 PM	4	0	4	0	0	107	2	0	0	0	0	0	2	96	0	0	215
01:15 PM	3	0	0	0	0	88	2	0	0	0	0	0	0	93	0	0	186
01:30 PM	4	0	7	0	0	99	18	0	0	0	0	0	1	127	0	0	256
01:45 PM	3	0	5	0	0	83	3	0	0	0	0	0	4	115	0	0	213
Total	14	0	16	0	0	377	25	0	0	0	0	0	7	431	0	0	870
02:00 PM	7	0	5	0	0	106	4	0	0	0	0	0	5	93	0	0	220
02:15 PM	3	0	6	0	0	84	4	0	0	0	0	0	1	127	0	0	225
02:30 PM	3	0	6	0	0	101	5	0	0	0	0	0	7	144	0	0	266
02:45 PM	5	0	6	0	0	101	7	0	0	0	0	0	2	124	0	0	245
Total	18	0	23	0	0	392	20	0	0	0	0	0	15	488	0	0	956

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File Name : Honouliuli Convenience Center - Geiger Rd
Site Code : 20-219 Leeward Baseyard relocation
Start Date : 8/25/2020
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Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	HONOULIULI CONVENIENCE CENTER Southbound				GEIGER RD Westbound				Northbound				GEIGER RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:00 PM	4	0	4	0	0	104	8	0	0	0	0	0	5	152	0	0	277
03:15 PM	6	0	3	0	0	126	8	0	0	0	0	0	2	152	0	0	297
03:30 PM	5	0	6	0	0	143	2	0	0	0	0	0	3	150	0	0	309
03:45 PM	2	0	5	0	0	111	6	0	0	0	0	0	4	175	0	0	303
Total	17	0	18	0	0	484	24	0	0	0	0	0	14	629	0	0	1186
04:00 PM	6	0	4	0	0	83	3	0	0	0	0	0	6	146	0	0	248
04:15 PM	5	0	7	0	0	109	10	0	0	0	0	0	3	158	0	0	292
04:30 PM	5	0	2	0	0	97	4	0	0	0	0	0	2	190	0	0	300
04:45 PM	7	0	2	0	0	101	5	0	0	0	0	0	3	179	0	0	297
Total	23	0	15	0	0	390	22	0	0	0	0	0	14	673	0	0	1137
05:00 PM	6	0	4	0	0	110	11	0	0	0	0	0	4	210	0	0	345
05:15 PM	8	0	4	0	0	90	9	0	0	0	0	0	2	175	0	0	288
05:30 PM	4	0	6	0	0	92	3	0	0	0	0	0	6	146	0	0	257
05:45 PM	4	0	3	0	0	100	2	0	0	0	0	0	3	152	0	0	264
Total	22	0	17	0	0	392	25	0	0	0	0	0	15	683	0	0	1154
Grand Total	217	0	198	7	0	4713	285	1	0	0	0	0	136	5079	0	0	10636
Apprch %	51.4	0	46.9	1.7	0	94.3	5.7	0	0	0	0	0	2.6	97.4	0	0	
Total %	2	0	1.9	0.1	0	44.3	2.7	0	0	0	0	0	1.3	47.8	0	0	
Motorcycles	0	0	0	0	0	28	0	0	0	0	0	0	0	31	0	0	59
% Motorcycles	0	0	0	0	0	0.6	0	0	0	0	0	0	0	0.6	0	0	0.6
Cars & Light Goods	210	0	184	0	0	4569	277	0	0	0	0	0	123	4941	0	0	10304
% Cars & Light Goods	96.8	0	92.9	0	0	96.9	97.2	0	0	0	0	0	90.4	97.3	0	0	96.9
Buses	0	0	0	0	0	21	0	0	0	0	0	0	0	25	0	0	46
% Buses	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0.5	0	0	0.4
Single-Unit Trucks	7	0	13	0	0	71	8	0	0	0	0	0	12	64	0	0	175
% Single-Unit Trucks	3.2	0	6.6	0	0	1.5	2.8	0	0	0	0	0	8.8	1.3	0	0	1.6
Articulated Trucks	0	0	1	0	0	17	0	0	0	0	0	0	1	11	0	0	30
% Articulated Trucks	0	0	0.5	0	0	0.4	0	0	0	0	0	0	0.7	0.2	0	0	0.3
Bicycles on Road	0	0	0	0	0	7	0	0	0	0	0	0	0	7	0	0	14
% Bicycles on Road	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0.1	0	0	0.1
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	7	0	0	0	1	0	0	0	0	0	0	0	0	8
% Pedestrians	0	0	0	100	0	0	0	100	0	0	0	0	0	0	0	0	0.1

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File Name : Honouliuli Convenience Center - Geiger Rd
Site Code : 20-219 Leeward Baseyard relocation
Start Date : 8/25/2020
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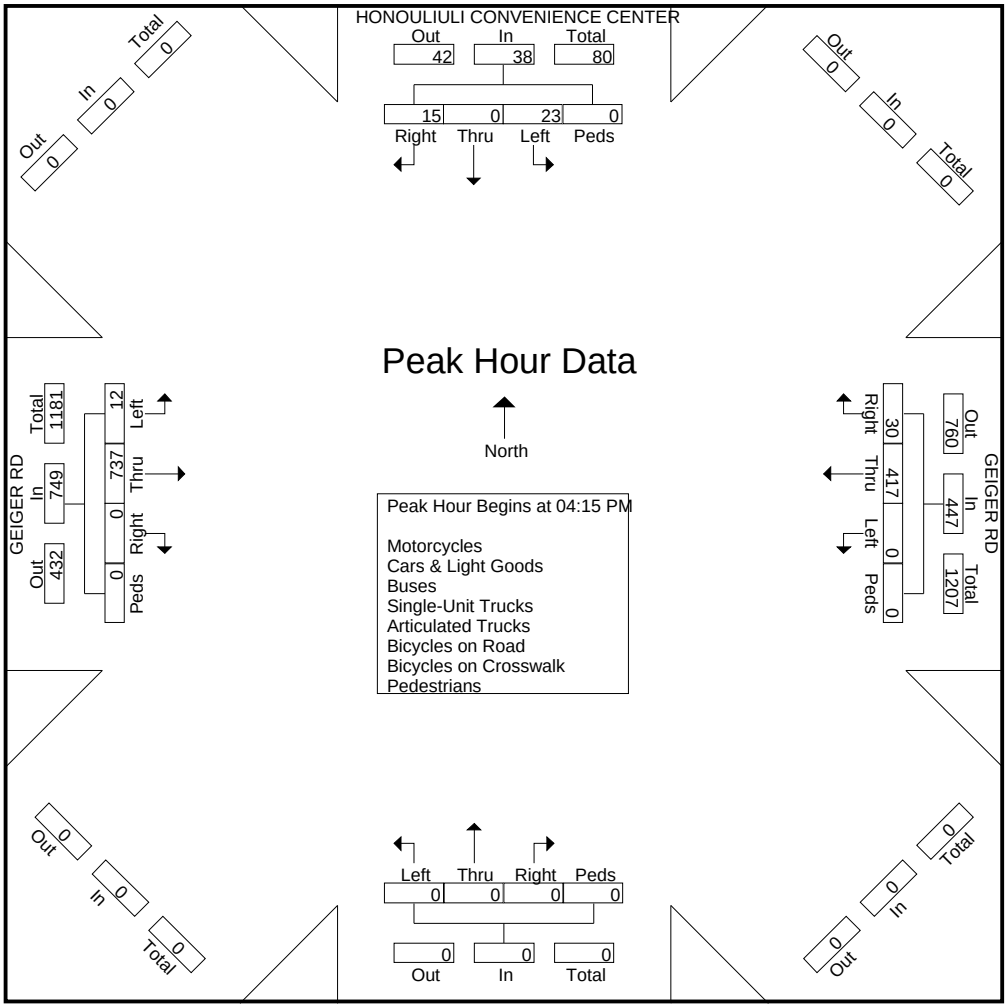
	HONOULIULI CONVENIENCE CENTER Southbound					GEIGER RD Westbound					Northbound					GEIGER RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	5	0	**7**	0	**12**	0	109	10	0	119	0	0	0	0	0	3	158	0	0	161	292
04:30 PM	5	0	2	0	7	0	97	4	0	101	0	0	0	0	0	2	190	0	0	192	300
04:45 PM	**7**	0	2	0	9	0	101	5	0	106	0	0	0	0	0	3	179	0	0	182	297
05:00 PM	6	0	4	0	10	0	**110**	**11**	0	**121**	0	0	0	0	0	**4**	**210**	0	0	**214**	**345**
Total Volume	23	0	15	0	38	0	417	30	0	447	0	0	0	0	0	12	737	0	0	749	1234
% App. Total	60.5	0	39.5	0		0	93.3	6.7	0		0	0	0	0		1.6	98.4	0	0		
PHF	.821	.000	.536	.000	.792	.000	.948	.682	.000	.924	.000	.000	.000	.000	.000	.750	.877	.000	.000	.875	.894



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File Name : WE_Honouliuli Convenience Center - Geiger Rd
Site Code : 20-219 Leeward Baseyard Relocation
Start Date : 8/29/2020
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Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	HONOULIULI CONVENIENCE CENTER Southbound				GEIGER RD Westbound				Northbound				GEIGER RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
06:00 AM	0	0	0	0	0	25	0	0	0	0	0	0	0	18	0	0	43
06:15 AM	0	0	0	0	0	30	0	0	0	0	0	4	1	16	0	0	51
06:30 AM	0	0	1	0	0	47	0	0	0	0	0	1	1	21	0	0	71
06:45 AM	0	0	0	0	0	38	0	0	0	0	0	1	1	30	0	0	70
Total	0	0	1	0	0	140	0	0	0	0	0	6	3	85	0	0	235
07:00 AM	1	0	2	0	0	40	15	0	0	0	0	0	2	26	0	0	86
07:15 AM	10	0	9	0	0	36	6	0	0	0	0	0	6	33	0	0	100
07:30 AM	5	0	6	0	0	61	3	0	0	0	0	3	1	25	0	0	104
07:45 AM	2	0	4	0	0	51	10	0	0	0	0	5	3	35	0	0	110
Total	18	0	21	0	0	188	34	0	0	0	0	8	12	119	0	0	400
08:00 AM	5	0	4	0	0	52	6	0	0	0	0	0	5	43	0	0	115
08:15 AM	4	0	3	0	0	76	6	0	0	0	0	2	3	50	0	0	144
08:30 AM	4	0	8	0	0	63	9	0	0	0	0	0	2	32	0	0	118
08:45 AM	4	0	2	0	0	76	13	0	0	0	0	4	3	59	0	0	161
Total	17	0	17	0	0	267	34	0	0	0	0	6	13	184	0	0	538
09:00 AM	10	0	2	0	0	82	7	0	0	0	0	0	3	69	0	0	173
09:15 AM	7	0	4	0	0	83	10	0	0	0	0	0	3	56	0	0	163
09:30 AM	6	0	9	0	0	81	6	0	0	0	0	3	3	64	0	0	172
09:45 AM	5	0	4	0	0	91	8	0	0	0	0	0	5	76	0	0	189
Total	28	0	19	0	0	337	31	0	0	0	0	3	14	265	0	0	697
10:00 AM	6	0	10	0	0	111	13	0	0	0	0	1	0	83	0	0	224
10:15 AM	6	0	8	0	0	103	14	0	0	0	0	0	0	82	0	0	213
10:30 AM	8	0	2	0	0	105	13	0	0	0	0	0	0	88	0	0	216
10:45 AM	4	0	10	0	0	114	13	0	0	0	0	1	1	106	0	0	249
Total	24	0	30	0	0	433	53	0	0	0	0	2	1	359	0	0	902
11:00 AM	8	0	3	0	0	105	11	0	0	0	0	0	0	105	0	0	232
11:15 AM	5	0	5	0	0	98	12	0	0	0	0	0	1	107	0	0	228
11:30 AM	8	0	7	0	0	118	12	0	0	0	0	0	1	117	0	0	263
11:45 AM	7	0	6	0	0	75	15	0	0	0	0	0	0	135	0	0	238
Total	28	0	21	0	0	396	50	0	0	0	0	0	2	464	0	0	961
12:00 PM	4	0	6	0	0	103	6	0	0	0	0	0	0	132	0	0	251
12:15 PM	8	0	4	0	0	88	11	0	0	0	0	0	0	117	0	0	228
12:30 PM	4	0	9	0	0	104	9	0	0	0	0	0	1	124	0	0	251
12:45 PM	3	0	5	0	0	98	17	0	0	0	0	0	1	123	0	0	247
Total	19	0	24	0	0	393	43	0	0	0	0	0	2	496	0	0	977
01:00 PM	3	0	3	0	0	89	7	0	0	0	0	0	0	117	0	0	219
01:15 PM	7	0	8	0	0	118	12	0	0	0	0	0	0	134	0	0	279
01:30 PM	8	0	6	0	0	95	13	0	0	0	0	0	0	123	0	0	245
01:45 PM	2	0	6	0	0	91	3	0	0	0	0	0	0	113	0	0	215
Total	20	0	23	0	0	393	35	0	0	0	0	0	0	487	0	0	958
02:00 PM	5	0	3	0	0	91	0	0	0	0	0	1	0	121	0	0	221
02:15 PM	1	0	1	2	0	87	10	0	0	0	0	0	2	114	0	0	217
02:30 PM	4	0	4	0	0	95	10	0	0	0	0	0	0	103	0	0	216
02:45 PM	8	0	8	0	0	88	11	0	0	0	0	0	0	130	0	0	245
Total	18	0	16	2	0	361	31	0	0	0	0	1	2	468	0	0	899

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File Name : WE_Honouliuli Convenience Center - Geiger Rd
Site Code : 20-219 Leeward Baseyard Relocation
Start Date : 8/29/2020

Groups Printed- Motorcycles - Cars & Light Goods - Buses - Unit Trucks - Articulated Trucks - Bicycles on Road - Bicycles on Crosswalk - Pedestrians

	HONOULIULI CONVENIENCE CENTER Southbound				GEIGER RD Westbound				Northbound				GEIGER RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
03:00 PM	2	0	7	0	0	72	8	0	0	0	0	0	1	107	0	0	197
03:15 PM	3	0	7	0	0	85	13	0	0	0	0	0	0	112	0	0	220
03:30 PM	3	0	6	0	0	83	10	0	0	0	0	0	0	88	0	0	190
03:45 PM	5	0	6	0	0	78	9	0	0	0	0	0	2	108	0	0	208
Total	13	0	26	0	0	318	40	0	0	0	0	0	3	415	0	0	815
04:00 PM	7	0	6	0	0	79	13	0	0	0	0	1	0	114	0	0	220
04:15 PM	6	0	9	0	0	69	12	0	0	0	0	0	0	126	0	0	222
04:30 PM	4	0	4	0	0	91	8	0	0	0	0	0	1	111	0	0	219
04:45 PM	5	0	1	0	0	100	7	0	0	0	0	0	1	99	0	0	213
Total	22	0	20	0	0	339	40	0	0	0	0	1	2	450	0	0	874
05:00 PM	11	0	9	0	0	88	9	0	0	0	0	0	5	125	0	0	247
05:15 PM	5	0	7	0	0	79	5	0	0	0	0	0	3	91	0	0	190
05:30 PM	5	0	4	0	0	80	6	0	0	0	0	0	2	130	0	0	227
05:45 PM	4	0	5	0	0	65	3	0	0	0	0	0	2	91	0	0	170
Total	25	0	25	0	0	312	23	0	0	0	0	0	12	437	0	0	834
Grand Total	232	0	243	2	0	3877	414	0	0	0	0	27	66	4229	0	0	9090
Apprch %	48.6	0	50.9	0.4	0	90.4	9.6	0	0	0	0	100	1.5	98.5	0	0	
Total %	2.6	0	2.7	0	0	42.7	4.6	0	0	0	0	0.3	0.7	46.5	0	0	
Motorcycles	0	0	0	0	0	21	0	0	0	0	0	0	0	19	0	0	40
% Motorcycles	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0.4	0	0	0.4
Cars & Light Goods	227	0	228	0	0	3793	412	0	0	0	0	0	47	4139	0	0	8846
% Cars & Light Goods	97.8	0	93.8	0	0	97.8	99.5	0	0	0	0	0	71.2	97.9	0	0	97.3
Buses	0	0	0	0	0	25	0	0	0	0	0	0	0	23	0	0	48
% Buses	0	0	0	0	0	0.6	0	0	0	0	0	0	0	0.5	0	0	0.5
Single-Unit Trucks	5	0	15	0	0	22	2	0	0	0	0	0	19	27	0	0	90
% Single-Unit Trucks	2.2	0	6.2	0	0	0.6	0.5	0	0	0	0	0	28.8	0.6	0	0	1
Articulated Trucks	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
% Articulated Trucks	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Road	0	0	0	0	0	14	0	0	0	0	0	0	0	19	0	0	33
% Bicycles on Road	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0.4	0	0	0.4
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	10
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0	0.1
Pedestrians	0	0	0	2	0	0	0	0	0	0	0	17	0	0	0	0	19
% Pedestrians	0	0	0	100	0	0	0	0	0	0	0	63	0	0	0	0	0.2

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Site Code : 20-219 Leeward Baseyard Relocation
Start Date : 8/29/2020
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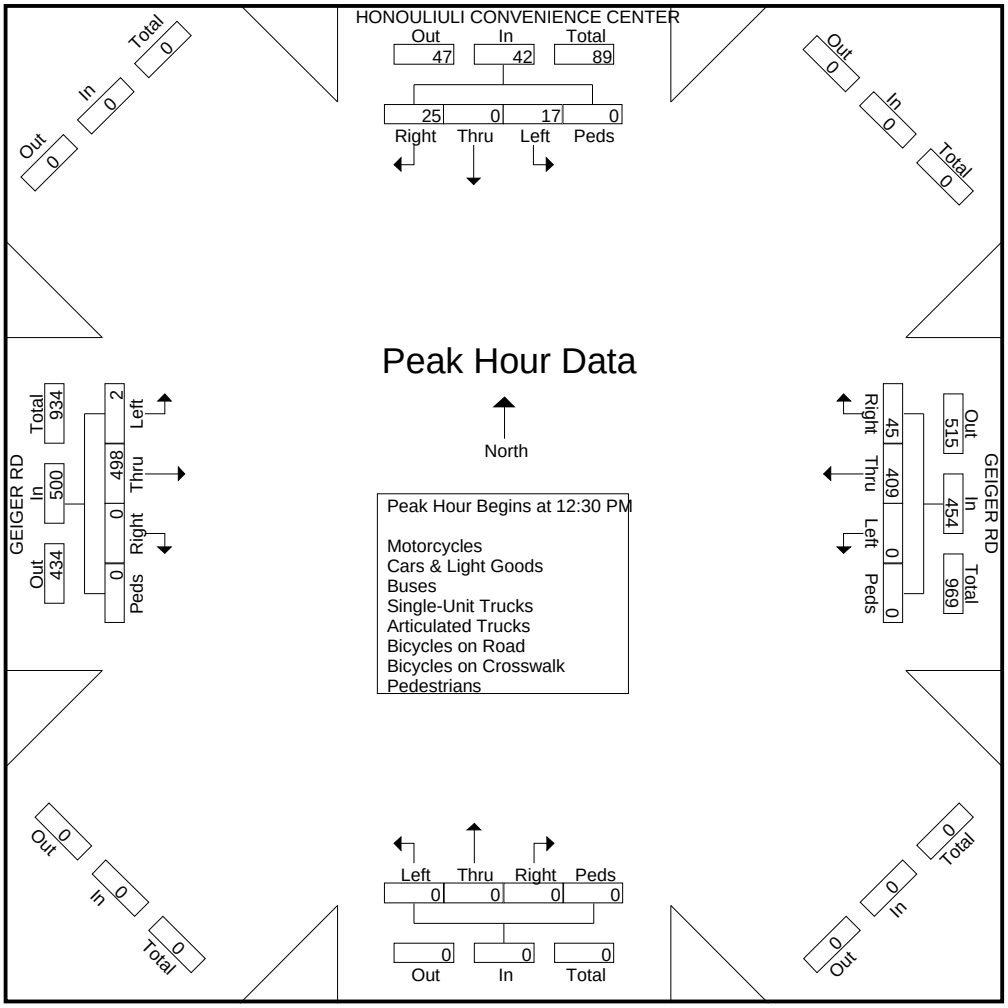
	HONOULIULI CONVENIENCE CENTER Southbound					GEIGER RD Westbound					Northbound					GEIGER RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:30 PM																					
12:30 PM	4	0	**9**	0	13	0	104	9	0	113	0	0	0	0	0	**1**	124	0	0	125	251
12:45 PM	3	0	5	0	8	0	98	**17**	0	115	0	0	0	0	0	1	123	0	0	124	247
01:00 PM	3	0	3	0	6	0	89	7	0	96	0	0	0	0	0	0	117	0	0	117	219
01:15 PM	**7**	0	8	0	**15**	0	**118**	12	0	**130**	0	0	0	0	0	0	**134**	0	0	**134**	**279**
Total Volume	17	0	25	0	42	0	409	45	0	454	0	0	0	0	0	2	498	0	0	500	996
% App. Total	40.5	0	59.5	0		0	90.1	9.9	0		0	0	0	0		0.4	99.6	0	0		
PHF	.607	.000	.694	.000	.700	.000	.867	.662	.000	.873	.000	.000	.000	.000	.000	.500	.929	.000	.000	.933	.892



APPENDIX C

LOS WORKSHEETS

APPENDIX C

LOS WORKSHEETS

Existing Conditions

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	16	730	13	14	762
Future Vol, veh/h	15	16	730	13	14	762
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	17	793	14	15	828

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1658	800	0	0	807	0
Stage 1	800	-	-	-	-	-
Stage 2	858	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	107	385	-	-	818	-
Stage 1	442	-	-	-	-	-
Stage 2	415	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	103	385	-	-	818	-
Mov Cap-2 Maneuver	103	-	-	-	-	-
Stage 1	442	-	-	-	-	-
Stage 2	401	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32.1	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	166	818	-
HCM Lane V/C Ratio	-	-	0.203	0.019	-
HCM Control Delay (s)	-	-	32.1	9.5	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	1	1	1	1	31
Future Vol, veh/h	27	1	1	1	1	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	1	1	1	1	34

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2	0	-	0	61	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	59	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1620	-	-	-	945	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	964	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1620	-	-	-	928	1082
Mov Cap-2 Maneuver	-	-	-	-	928	-
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	964	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1620	-	-	-	1076
HCM Lane V/C Ratio	0.018	-	-	-	0.032
HCM Control Delay (s)	7.3	0	-	-	8.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	13	684	12	12	714
Future Vol, veh/h	15	13	684	12	12	714
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	14	743	13	13	776

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1552	750	0	0	756	0
Stage 1	750	-	-	-	-	-
Stage 2	802	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	125	411	-	-	855	-
Stage 1	467	-	-	-	-	-
Stage 2	441	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	122	411	-	-	855	-
Mov Cap-2 Maneuver	122	-	-	-	-	-
Stage 1	467	-	-	-	-	-
Stage 2	429	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.9	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	181	855	-
HCM Lane V/C Ratio	-	-	0.168	0.015	-
HCM Control Delay (s)	-	-	28.9	9.3	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	1	1	1	1	28
Future Vol, veh/h	24	1	1	1	1	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	1	1	1	1	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2	0	-	0	55	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	53	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1620	-	-	-	953	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	970	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1620	-	-	-	938	1082
Mov Cap-2 Maneuver	-	-	-	-	938	-
Stage 1	-	-	-	-	1005	-
Stage 2	-	-	-	-	970	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1620	-	-	-	1076
HCM Lane V/C Ratio	0.016	-	-	-	0.029
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

APPENDIX C

LOS WORKSHEETS

Base Year 2022 Conditions

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	16	849	13	14	879
Future Vol, veh/h	15	16	849	13	14	879
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	17	923	14	15	955

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1915	930	0	0	937	0
Stage 1	930	-	-	-	-	-
Stage 2	985	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	74	324	-	-	731	-
Stage 1	384	-	-	-	-	-
Stage 2	362	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	71	324	-	-	731	-
Mov Cap-2 Maneuver	71	-	-	-	-	-
Stage 1	384	-	-	-	-	-
Stage 2	346	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	46.8	0	0.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	119	731	-
HCM Lane V/C Ratio	-	-	0.283	0.021	-
HCM Control Delay (s)	-	-	46.8	10	0
HCM Lane LOS	-	-	E	B	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	1	1	1	1	31
Future Vol, veh/h	24	1	1	1	1	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	1	1	1	1	34

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2	0	-	0	55	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	53	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1620	-	-	-	953	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	970	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1620	-	-	-	938	1082
Mov Cap-2 Maneuver	-	-	-	-	938	-
Stage 1	-	-	-	-	1005	-
Stage 2	-	-	-	-	970	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1620	-	-	-	1077
HCM Lane V/C Ratio	0.016	-	-	-	0.032
HCM Control Delay (s)	7.3	0	-	-	8.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	13	812	12	12	819
Future Vol, veh/h	15	13	812	12	12	819
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	14	883	13	13	890

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1806	890	0	0	896	0
Stage 1	890	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	87	342	-	-	757	-
Stage 1	401	-	-	-	-	-
Stage 2	390	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	84	342	-	-	757	-
Mov Cap-2 Maneuver	84	-	-	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	377	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41.3	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	129	757	-
HCM Lane V/C Ratio	-	-	0.236	0.017	-
HCM Control Delay (s)	-	-	41.3	9.8	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	1	1	1	1	28
Future Vol, veh/h	24	1	1	1	1	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	1	1	1	1	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2	0	-	0	55	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	53	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1620	-	-	-	953	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	970	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1620	-	-	-	938	1082
Mov Cap-2 Maneuver	-	-	-	-	938	-
Stage 1	-	-	-	-	1005	-
Stage 2	-	-	-	-	970	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1620	-	-	-	1076
HCM Lane V/C Ratio	0.016	-	-	-	0.029
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

APPENDIX C

LOS WORKSHEETS

Future Year 2022 Conditions

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	17	18	849	15	16	879
Future Vol, veh/h	17	18	849	15	16	879
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	20	923	16	17	955

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1920	931	0	0	939	0
Stage 1	931	-	-	-	-	-
Stage 2	989	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	74	324	-	-	730	-
Stage 1	384	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	70	324	-	-	730	-
Mov Cap-2 Maneuver	70	-	-	-	-	-
Stage 1	384	-	-	-	-	-
Stage 2	342	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	49.9	0	0.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	117	730	-
HCM Lane V/C Ratio	-	-	0.325	0.024	-
HCM Control Delay (s)	-	-	49.9	10.1	0
HCM Lane LOS	-	-	E	B	A
HCM 95th %tile Q(veh)	-	-	1.3	0.1	-

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	1	1	1	1	35
Future Vol, veh/h	31	1	1	1	1	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	1	1	1	1	38

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2	0	-	0	71	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	69	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1620	-	-	-	933	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1620	-	-	-	913	1082
Mov Cap-2 Maneuver	-	-	-	-	913	-
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	954	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1620	-	-	-	1076
HCM Lane V/C Ratio	0.021	-	-	-	0.036
HCM Control Delay (s)	7.3	0	-	-	8.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	17	15	812	14	14	819
Future Vol, veh/h	17	15	812	14	14	819
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	16	883	15	15	890

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1811	891	0	0	898	0
Stage 1	891	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	86	341	-	-	756	-
Stage 1	401	-	-	-	-	-
Stage 2	388	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	83	341	-	-	756	-
Mov Cap-2 Maneuver	83	-	-	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	373	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	42.9	0	0.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	129	756	-
HCM Lane V/C Ratio	-	-	0.27	0.02	-
HCM Control Delay (s)	-	-	42.9	9.9	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	1	0.1	-

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	1	1	1	1	32
Future Vol, veh/h	28	1	1	1	1	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	1	1	1	1	35

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2	0	-	0	63	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	61	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1620	-	-	-	943	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	962	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1620	-	-	-	925	1082
Mov Cap-2 Maneuver	-	-	-	-	925	-
Stage 1	-	-	-	-	1002	-
Stage 2	-	-	-	-	962	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1620	-	-	-	1076
HCM Lane V/C Ratio	0.019	-	-	-	0.033
HCM Control Delay (s)	7.3	0	-	-	8.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1