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STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

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ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

July 6, 2023

Ref: GL5468

Ms. Mary Alice Evans, Director
Office of Planning and Sustainable Development
Environmental Review Program
State of Hawaii
P.O. Box 2359
Honolulu, HI 96804-2359

Dear Ms. Evans:

SUBJECT: Draft Environmental Assessment for the Mālama Honua Public Charter School Foundation & Hui Mālama O Ke Kai Foundation Improvement Plan in the Waimānalo, Koolaupoko, Oʻahu, TMK (1) 4-1-009: 265

The Department of Land and Natural Resources hereby transmits the Draft Environmental Assessment (DEA) for the subject project at tax map key parcel (1) 4-1-009: 265 and anticipates a Finding of No Significant Impact determination. Please publish the notice of the availability of the DEA for this project in the next edition of the periodic bulletin.

We kindly submit the required items for publication including a searchable pdf file of the DEA.

If there are any questions, please contact Barry Cheung, Oahu District Land Office at (808) 587-0430.

Sincerely,

Dawn N.S. Chang
Chairperson KCM RT

Enclosures

c: Denise Espania (MHPCS), Mailelaulii Vickery (HMK), and Tricia Dang (Tridason LLC)

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Friday, July 7, 2023 1:28:02 AM

Action Name

Mālama Honua Public Charter School Foundation & Hui Mālama o Ke Kai Improvement Plan

Type of Document/Determination

Draft environmental assessment and anticipated finding of no significant impact (DEA-AFNSI)

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

Koʻolaupoko, Oʻahu

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

(1) 4-1-009: 265

Action type

Applicant

Other required permits and approvals

Conditional Use Permit (CUP), National Pollutant Discharge Elimination System (NPDES), Community Noise, Building, Grading and Grubbing Permit, Sanitation Food Safety, Others (see Section 2.7 of document)

Discretionary consent required

n/a

Approving agency

Department of Land and Natural Resources

Agency contact name

Barry Cheung

Agency contact email (for info about the action)

barry.w.cheung@hawaii.gov

Email address or URL for receiving comments

tricia@tridason.com

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(808) 587-0430

Agency address

PO Box 2359
Honolulu, Hawaii 96804-2359
United States

Map It

Applicant

Mālama Honua Public Charter School Foundation (MHPCSF) in coordination with Hui Mālama o Ke Kai Foundation (HMK)

Applicant contact name

Denise Espania

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41-054 Ehukai St
Waimanalo, HI 96795
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Map It

Was this submittal prepared by a consultant?

Yes

Consultant

Tridason LLC

Consultant contact name

Tricia Dang

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tricia@tridason.com

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Consultant address

PO box 1361
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Map It

Action summary

Mālama Honua Public Charter School Foundation (MHPCSF) in collaboration with Hui Mālama O Ke Kai Foundation (HMK) proposes new improvements for programmatic use and collaboration. The proposed Project includes 12 single-story structures (6 classroom pods and an administrative structure for MHPCSF, 4 yurts for HMK, and a shared kitchen/pavilion building) designed in a village-style layout to foster community and connection. With an average floor area of 1,897 SF, the structures will be positioned behind the existing structures, preserving the view plane and maintaining the existing street front view. Additionally, the Project parking and turnaround is over 400 feet from the property entrance with the designated Project parking area discreetly located behind the existing structures.

Reasons supporting determination

The Proposed Action offers a valuable service to the community by operating two (2) established youth-focused programs within the same site, combining school-based and out-of-school efforts. Together, HMK and MHPCSF will have a positive impact on the community, nurturing a thriving generation of young individuals through the integration of ʻāina-based and cultural-based learning. Their collaborative efforts go beyond traditional academic subjects, aiming to cultivate future leaders. By fostering essential skills, traditional ecological knowledge, and Hawaiian cultural values, they contribute to the social and economic growth of the community, establishing a strong foundation for the development and well-being of its students and participants.

Additional discussion can be found in Section 6, Determination of Significance

Attached documents (signed agency letter & EA/EIS)

- EA-MHPCS-6-28-2023.pdf
- DLNR-MHPCSF-HMK-DEA_FONSI-signed.pdf

Action location map

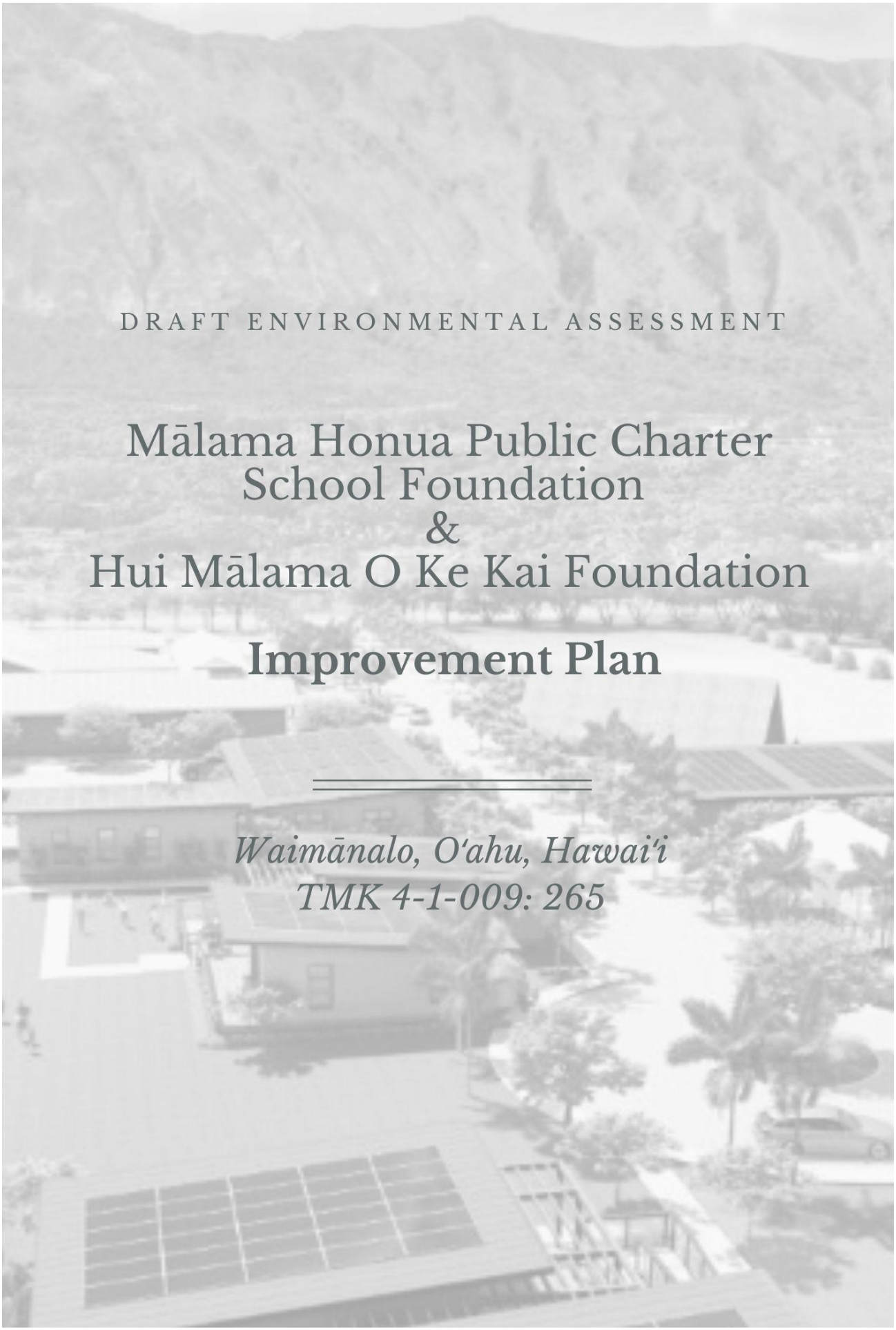
- TMK-4-1-009-265.zip

Authorized individual

Tricia Dang

Authorization

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



DRAFT ENVIRONMENTAL ASSESSMENT

Mālama Honua Public Charter School Foundation
&
Hui Mālama O Ke Kai Foundation

Improvement Plan

Waimānalo, Oʻahu, Hawaiʻi
TMK 4-1-009: 265

JUNE 2023

Mālama Honua Public Charter School Foundation
&
Hui Mālama O Ke Kai Foundation Improvement Plan

Draft Environmental Assessment

Waimānalo, Oʻahu, Hawaiʻi

TMK 4-1-009: 265

Applicant:

Mālama Honua Public Charter School Foundation
&
Hui Mālama O Ke Kai Foundation

Approving Agency:

Department of Land and Natural Resources - Land Division

Kalanimoku Building

1151 Punchbowl St. Honolulu, Hawaiʻi 96813

Prepared by:

Tridason LLC

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List of Terminology, Abbreviations, and Glossary of Hawaiian Terms

Terminology:

Action	Any program or project to be initiated by an agency or applicant (HAR, 11-200.1-2).
Applicant	Any person that, pursuant to statute, ordinance, or rule, officially requests approval from an agency for a proposed action…. "Person" includes any individual, partnership, firm, association, trust, estate, private corporation, or other legal entity other than an agency. (HAR, 11-200.1-2)
Effect & Impact	"Effects" or "impacts" are synonymous. Effects may include ecological effects…Effects may also include those effects resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial (HAR, 11-200.1-2).
Environment	… humanity's surroundings, inclusive of all the physical, economic, cultural, and social conditions that exist within the area affected by a proposed action, including land, human and animal communities, health, air, water, minerals, flora, fauna, ambient noise, and objects of historic, cultural, or aesthetic significance (HAR, 11-200.1-2).
Program	A series of one or more projects to be carried out concurrently or in phases within a general timeline that may include multiple sites or geographic areas, and is undertaken for a broad goal or purpose (HAR, 11-200.1-2).
Project	A discrete, planned undertaking that is site and time specific, has a specific goal or purpose and has potential impact to the environment (HAR, 11-200.1-2).
Significant Effect or Significant Impact	The sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource, curtail the range of beneficial uses of the environment, are contrary to the State's environmental policies or long-term environmental goals and guidelines as established by law, adversely affect the economic welfare, social welfare, or cultural practices of the community and State, or are otherwise set forth in section 11-200.1-13.

Abbreviations:

AYSA - Aquifer System Area
BFE - Base flood elevation
BLNR - Hawaii Board of Land and Natural Resources
BMP – Best Management Practices
BWS – Board of Water Supply
CWRM – DLNR Commission on Water Resource Management
DHHL – Department of Hawaiian Home Lands
DLNR – Department of Land and Natural Resources
DPP – Department of Planning & Permitting
EA - Environmental Assessment
FONSI - Finding of No Significant Impact
HAR - Hawai‘i Administrative Rules
HECO - Hawaiian Electric Company
HMK - Hui Mālama O Ke Kai Foundation
HRS - Hawai‘i Revised Statutes
mgd - Million gallons per day
MHPCS - Mālama Honua Public Charter School
MHPCSF - Mālama Honua Public Charter School Foundation
NPDES - National Pollutant Discharge System
ORTP - O‘ahu Regional Transportation Plan
PCBMP – Post Construction Best Management Practices
SAAQS - State Ambient Air Quality Standards
SLR – Sea Level Rise
SLRXA - SLR Exposure Area
SMA - Special Management Area
SY – School Year
TMK – Tax Map Key
WTP - Waimānalo Teen Project
WWTP - Waimānalo Wastewater Treatment Plant

Glossary of Hawaiian Terms

This Environmental Assessment (EA) incorporates and relies on words and concepts from the Hawaiian language, known as 'ōlelo Hawai'i. When translating between 'ōlelo Hawai'i and English, there may not always be a direct equivalent for a word, and instead, there may be multiple interpretations that have slight differences.

In order to support cultural and land-based education and provide context, this report includes numerous commonly used Hawaiian words. To assist in translating, the following glossary offers various contextual explanations and translations for words that are repeated throughout this EA. The first occurrence of each translated word is also annotated with a definition in a footnote within the main body of this document.

ahupua'a (land division)
'āina (land, that which feeds)
ali'i (Chief, chiefess, officer, ruler)
haumāna (student)
'ike ('ike (to see, know, feel)
'ike kūpuna (ancestral wisdom)
'ili (subdivisions of an ahupua'a).
kai (sea; area near the sea)
kalo (taro, or *Colocasia esculenta*)
keiki (child)
kumu (teacher)
lo'i kalo (wetland irrigated field for taro where water passes through and corms are submerged)
mālama 'āina (to care for the land)
mea 'ai (food)
moku (regional land divisions)
'ohana (family, relative)
'ōpio (youth)
pali (cliff)
pohaku (stone)

1. Introduction

In 1990, the State of Hawaii issued a 65-year lease to Waimānalo Teen Project (WTP) and in 2014, BLNR approved the merger of WTP and Hui Mālama O Ke Kai Foundation (HMK) in which the latter is the surviving entity, whose program mission and purpose remain unchanged. Thus, for the past 25 years, WTP/HMK has been the principal lessee of the 11-acre site located at 41-477 Hihimanu Street, Waimānalo, O`ahu, TMK 4-1-009:265 (Property) (See Figures 1 and 2: Location Map and Tax Map Key). Operating as a non-profit organization, HMK provides a safe space for keiki (child), ʻōpio (youth), and ʻohana (family, relative) of Waimānalo to engage in culture-based activities with an emphasis on kai (sea; near the sea).

In 2021, the State of Hawaii Board of Land and Natural Resources (BLNR) approved a sublease to allow Mālama Honua Public Charter School Foundation (MHPCSF) to operate its Title 1 charter school and educational learning center within the Property.

Opening School Year (SY) 2014/2015, the Mālama Honua Public Charter School (MHPCS) serves the Waimānalo community with a rigorous learning environment rooted in Hawaiian cultural values inspired by the Mālama Honua Voyage, a circumnavigational sail of the Earth on the traditional voyaging canoes Hōkūleʻa and Hikianalia. During SY 2022/23, MHPCS served students from kindergarten through grade 8, while the Proposed Project aims to serve these same grade levels plus a pre-kindergarten class.

Together, HMK and MHPCSF seek to create a collaborative site that complements each organization's programs and efforts. Together, they independently operate, yet strategically work together to connect its participants and their families to additional programming and opportunities, furthering the practice of mālama ʻāina (to care for the land) and learning that is rooted in Native Hawaiian perspectives.

The proposed Project solidifies both entities' commitment to complement and strengthen each other's programmatic missions.

In support of the MHPCS vision, the proposed Project includes building the MHPCS site within 3.07 acres of vacant and unmaintained land directly behind the existing HMK buildings ("Project Area"). This Action thereby unifies the existing (3) Waimānalo-based satellite learning sites into a single location, relocating its current kindergarten to Grade 8 classes to the proposed classroom pods and re-opening physical space across Waimānalo for other valuable community uses. In addition, the proposed Action includes long-anticipated additional building space in the form of four (4) 30-foot diameter yurts that will support existing HMK programs and activities.

In total, the proposed Project includes twelve (12) new single-story structures (7 for MHPCS use, 4 for HMK use, and 1 shared kitchen/pavilion building) designed with a village-style layout or an arrangement of several small structures in proximity to one another that creates a close-knit sense of community and tranquil interconnection with adjacent open space. Together, the total floor area proposed is 22,767 Square Feet (SF), or an average floor area of 1,897 SF per structure. Section 2.4 of this document provides a detailed summary of each building.

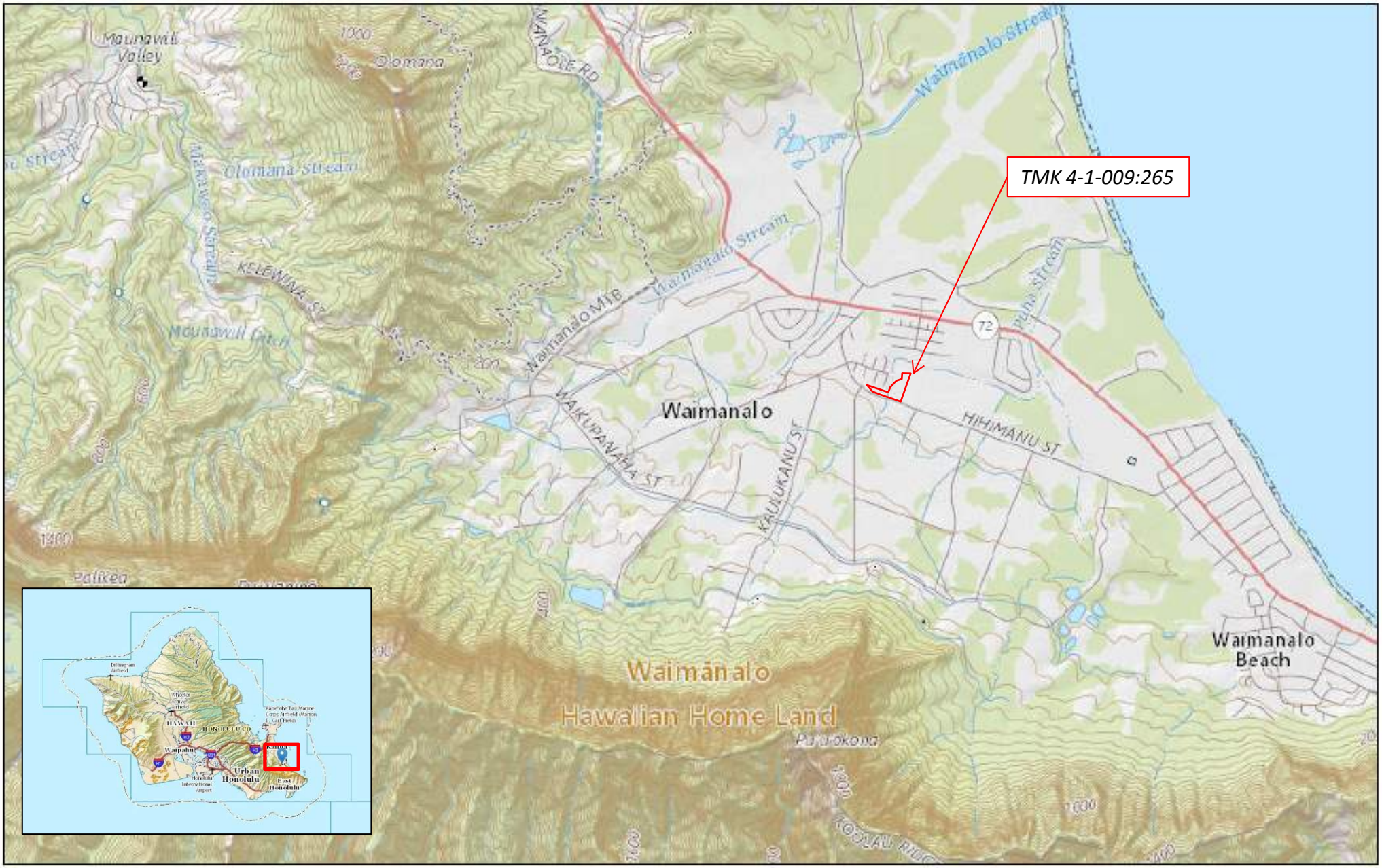


Figure 1: Location Map

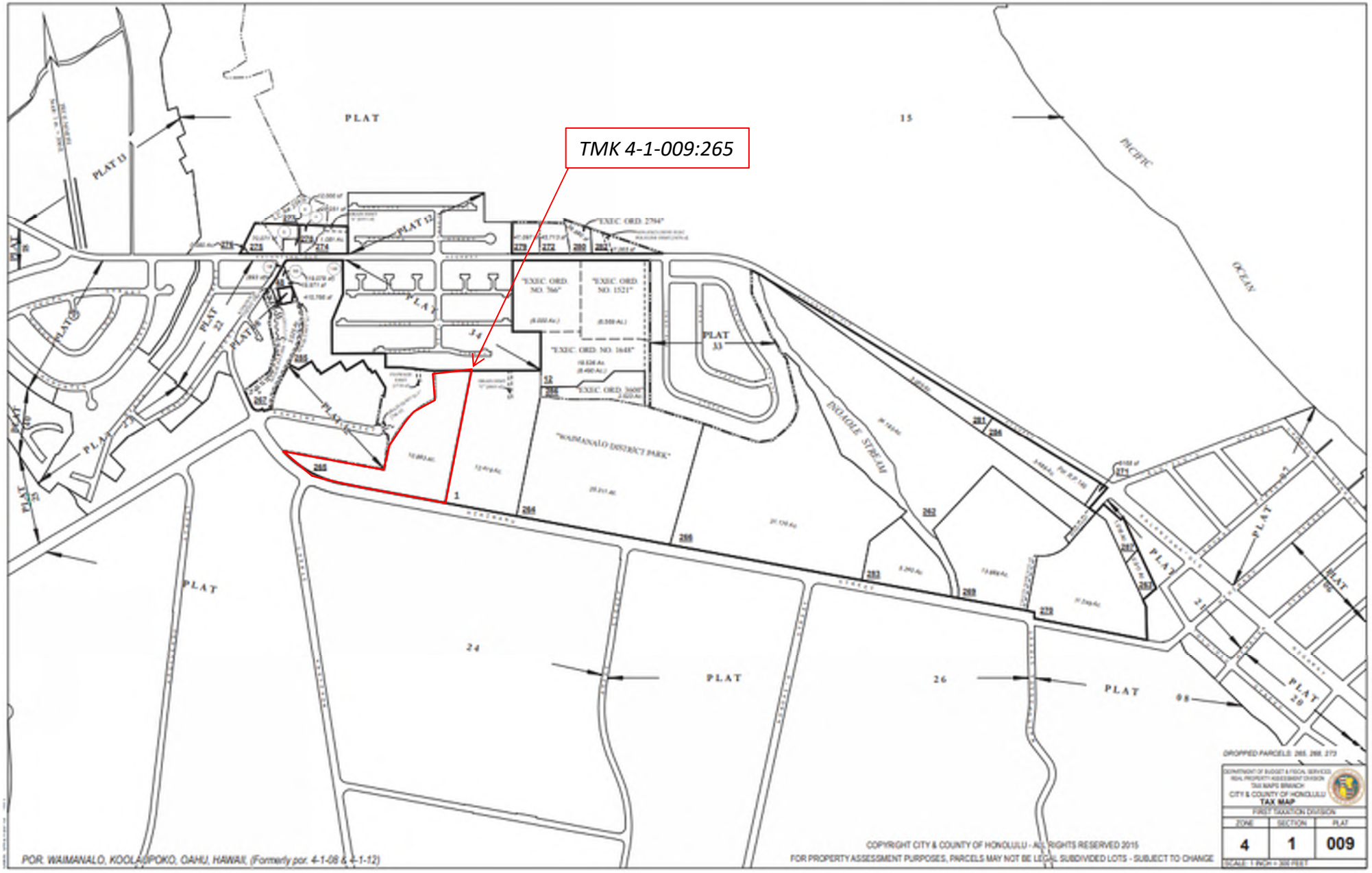


Figure 2: Tax Map Key 4-1-009

1.1. Purpose of the Environmental Assessment

This Environmental Assessment (EA) is prepared in accordance with the environmental review requirements of Chapter 343, Hawai‘i Revised Statutes (HRS), as amended, and Title 11, Chapter 200, Hawai‘i Administrative Rules (HAR). An EA is required due to the use of state or county lands or the use of state or county funds.

This EA is intended to address all current and future instances involving the use of State lands relating to the proposed Project and potential environmental and socio-economic consequences of the Proposed Action and reasonable alternatives. The intent of the EA is to provide sufficient analysis for determining whether the Proposed Action requires preparation of an environmental impact statement or a Finding of No Significant Impact (FONSI) pursuant to Chapter 343 HRS.

1.2. Project Summary

Project Name:	Mālama Honua Public Charter School Foundation & Hui Mālama o Ke Kai Improvement Plan
Type of Document	Draft Environmental Assessment (EA) pursuant to Hawai‘i Revised Statutes (HRS), Chapter 343, and Hawai‘i Administrative Rules (HAR), Title 11, Chapter 200
Trigger	Propose the use of state or county lands or the use of state or county funds.
Applicant:	Mālama Honua Public Charter School Foundation (MHPCSF) in coordination with Hui Mālama o Ke Kai Foundation (HMK)
Judicial District:	Waimānalo, O‘ahu, Hawai‘i
Tax Map Keys (TMK)	4-1-009: 265 (Property)
TMK Land Area:	Lot 265: 474,499 Square Feet (10.89 Acres)
Project Area:	134,111 Square Feet (3.07 acres)
Development Plan Area:	Ko‘olau Poko

State Land Use:	Urban District
CCH Zoning:	Agriculture-2 (General Agricultural District)
Recorded Fee Owner:	State of Hawai‘i
Current Land Use:	The Property is used by HMK as its program facility and subleased to MHPCS as a satellite, interim classroom location for Grades 3 to 6. The Project Area is unused and unmaintained land located in the middle of the Property.
Special Management Area:	The Property is not located within the Special Management Area (SMA).
Anticipated Determination	Finding of No Significant Impact (FONSI)
Approving Agency:	State of Hawai‘i Department of Land and Natural Resources, Land Division 1151 Punchbowl Street Honolulu, HI 96813
Consultant Contact	Tricia Dang, Principal Tridason LLC PO Box 1361, Honolulu, HI 96807 tricia@tridason.com

1.3. About the Applicant

Hui Mālama O Ke Kai Foundation:

HMK is a 501(c)(3) grassroots, community-based, nonprofit organization created to sustain culture-based after-school and family-strengthening programs. Originally known as Waimānalo Teen Project, around 1990, the grassroots effort was created by volunteer community members of Waimānalo who were concerned about keiki (specifically, Native Hawaiian children in the 5th & 6th grades) being without supervision during the after-school hours and the need for positive extracurricular activities and ocean safety skills. In 1999, Waimānalo Teen Project was renamed HMK, and for the last 24 years, HMK has continued the Teen Project legacy into the present day.

Through its programming, HMK continues to cultivate the development (social/emotional, physical, and educational) of participating ‘ōpio and provides programs to strengthen families and the community

through innovative, culturally grounded, and evidence-based strategies. Since 2021, in response to COVID-19, HMK has been pursuing entitlement approval to modify its existing structure to incorporate a covered deck along its northwest side of the building, creating a shaded open-air space to support physical distancing and a space for permanent outdoor learning and cultural activities. These improvements are considered minor improvements by the State of Hawaii and the City and County of Honolulu, which require a minor modification permit approval along with building permit approval. The proposed Project includes (4) new identical 30-foot diameter yurts that will create additional physical space to host HMKs existing programs, while the new shared multi-use pavilion and commercial kitchen provide drastically improved ancillary resources available to HMK's staff, participants, and families.

Mālama Honua Public Charter School Foundation and School:

MHPCSF, a 501(c)(3), was created in 2014 to exclusively support the programs and activities of MHPCS, a Title 1 school that was inspired by the Worldwide Voyage of Hōkūleʻa. Opening SY 2014/2015, MHPCS serves the Waimānalo community with a rigorous learning environment rooted in Hawaiian cultural values inspired by the Mālama Honua Voyage, a circumnavigational sail of the Earth that occurred from 2013 to 2018 on the voyaging canoes Hōkūleʻa and Hikianalia. During the SY 2022/23, MHPCS served students from kindergarten through grade 8, while the Proposed Project aims to serve the same grade levels plus a pre-kindergarten class. The SY 2022/2023 enrollment was 160 students, 78% of which are Native Hawaiian, 21% of which live on Hawaiian Homestead lands, and 60% of which are Waimānalo residents.

The MHPCS vision states, "One day, students will possess the mind, values, capacities, and empowerment to fulfill their potential and positively impact society's most pressing social and environmental challenges." As a center for learning, the MHPCS mission is, "To provide an education that cultivates the caring, compassionate, and astute 'mind of the navigator' in students and teachers alike by the appropriate application of indigenous Hawaiian values, inclusive of 21st-century skills."

While charter schools are not currently awarded funding by the State Department of Education for facilities, as the State of Hawaii Public Charter School, MHPCS brings a long-term commitment to implement its educational programs. MHPCS has been particularly successful in garnering support from community organizations, foundations, and values-aligned partners across the island.

With a prioritization of 'ohana and community involvement, Mālama Honua strives to be a school where leading together, learning, and acting with compassion, results in the ongoing education of staff, keiki, and community alike. MHPCS was always envisioned to be more than simply a learning center for children, but also a teaching and learning center for the whole of the community. Family participation and community engagement are essential components to the success and foundation of the school.

The involvement of community partners is crucial to fostering a thriving school culture and supporting the project-based learning environment at MHPCS. Since its establishment, MHPCS has been dedicated to meeting the articulated needs of the community it serves. One notable community partner is the University of Hawaii College of Tropical Agriculture and Human Resources (UH CTAHR) Waimānalo Learning Center. This established partnership allows MHPCS students to engage in hands-on learning experiences related to sustainable agriculture projects and aquaponic systems, introducing them to current research and higher education learning opportunities.

Further, in collaboration with local ‘āina (land, that which feeds)-based organizations students regularly participate in field trips and site visits. Some of these organizations include Ke Kula Nui O Waimānalo, 808 Cleanups, Nation of Hawai'i, Ho'okua 'āina, Hanauma Bay, Paepae O He'eia, Ulupō, Maunalua Fishpond Heritage Association, Kānehūnāmoku Voyaging Academy, Waimānalo Health Center, Waimānalo Canoe Club, and Sea Life Park Hawaii. These partnerships provide students with valuable opportunities to learn from and contribute to various community initiatives, offering first-hand experiences in ‘āina-based work occurring within the community.

One of the most significant and impactful partnerships takes place on-site within the Property itself. The collaboration between HMK and MHPCS goes beyond providing out-of-school program opportunities. During the school day, HMK shares its programs with MHPCS students. For instance, the cultural experience of the papa (board) and pohaku (stone) course for 7th graders involves teaching the students the Hawaiian tradition of hand-carving a papa ku’i ‘ai (poi board) and a pohaku ku’i ‘ai (stone poi pounder) using natural materials gathered from the land. This meaningful and culturally significant experience further enhances the learning journey for students, families, and staff. Students and their families also participate in HMK programs after-school and during the weekends, enhancing the student’s learning opportunities and creating deeply meaningful connections to the place.

The potential for cross-collaboration between HMK and MHPCS is limitless, enriching the overall learning experience and fostering a deeper impact on the well-being and development of students, families, and staff.

<u>HMK & MHPCSF Lease Agreement with the State of Hawaii, Board of Land and Natural Resources:</u>

In 1990, the State of Hawaii issued a 65-year lease to Waimānalo Teen Project (WTP) for a multi-purpose community facility. In 1999, the BLNR authorized the amendment of the master lease to allow sublease on the Property subject to prior written approval. In 2014, BLNR approved the merger of WTP and HMK in which the latter is the surviving entity; the program mission and purpose remained the same (BLNR, 2021).

On September 24, 2021, MHPCSF requested and was granted a sublease (under General Lease No. S-5468) by the BLNR for its public charter school and education learning center. The term of the HMK master lease is for 65 years, commencing on May 1, 1996, and expiring on April 30, 2061. The MHPCSF sublease will run coterminous with General Lease No. 5468, expiring on April 30, 2061. Under a Letter of Intent signed by HMK and MHPCS, both entities are committed to working collaboratively as education partners to share physical space and complement their programmatic mission.

2. Project Description

2.1. Project Location and Site Description

The proposed Project, Tax Map Key (TMK) 4-1-009: 265 is a 10.89 parcel located at 41-477 Hihimanu Street, Waimānalo, O‘ahu. The Property is located 0.5 miles southeast of Kalaniana‘ole Highway on Hihimanu Street, a collector street in Waimānalo (see Figures 1 and 2: Location Map and Tax Map Key).

The Property is located in the area of a former sugar mill and subsequent backyard agriculture uses. The

front half of the Property is currently used for HMKs facilities and programs. The back half of the Property, which includes the Project Area, has remained vacant and overgrown since WTP/HMK occupied the Property.

2.2. Surround Uses

The Property is surrounded by various land uses (See Figure 3: Aerial Site Map). Immediately west of the Property is the Waimānalo Banyan Tree Apartments, a multi-family residential development. To the east is Hawaii Job Core Training Center (classified as an "institutional campus" within the 2017 Koʻolau Poko Sustainable Communities Plan) and the 25.3-acre Waimānalo District Park. Behind the Property is the Waimānalo Village Residences, a single-family residential development. The Waimānalo commercial area is located 0.5 miles from the Property.

The immediate surrounding area supports a range of housing options from multi-family to single-family homes as well as equestrian or agricultural-related distribution facilities. Notably, a significant portion of the surrounding land is owned by the State of Hawaii and the Department of Hawaiian Home Lands (DHHL) (see Figure 4: Major Land Owners in Waimānalo).

2.3. Existing Uses

Currently, HMK's programs and community-based activities occupy approximately 6.4 acres of the 10.89-acre site, entirely located at the front of the Property. Among this area, 4.65 acres on the northwest side (left side when entering the Property) of the street front are dedicated to gardening and open space, while the southeast side (right side when entering the Property) houses the existing structures, ancillary facilities, and designated parking areas. As HMK is mainly an out-of-school program, they temporarily sublease its existing facility with MHPCS grades 3 to 6 during regular school hours.

Since the original design of the existing buildings in 1987, no improvements have been made to the 10.89-acre site. HMK has been working with the State Department of Land and Natural Resources (DLNR) and the City Department of Planning and Permitting (DPP) on approval of a COVID pandemic-related minor improvement to the existing main structure by including a new covered patio on the Kailua side of the structure. This open-air patio is located on the Property but outside of the Project Area. The existing on-site structures are inadequate for permanent use by both HMK and MHPCS programs. Therefore, the proposed new structures aim to provide designated, safe, and flexible learning spaces for students, participants, families, and community members.

The northwest side of the Property features a culturally significant Hale, a traditional Native Hawaiian structure that was exempt from the building application permit process (HRS 46-88). This open-air, A-frame style Hale is located behind the gardening and open space area and serves as a space for teaching and practicing cultural traditions.

Behind the HMK facilities and Hale, the land is unused and heavily overgrown with invasive vegetation and remnants from past activities, including fencing and residential debris (see Figure 5: Site Photos).

Figure 3: Aerial Site Map

Figure 4: Major Land Owners in Waimanalo

Source: DHHL. "Waimanalo Regional Plan". November 2011

Above: Street view from Hihimanu Street

Above: View of Project Area looking towards the rear of property.

Above: View of Project Area looking south.

Figure 5: Existing Site Photos

2.4. Purpose & Program Components

The proposed Project will be situated in the Project Area that covers 3.07 acres at the central location of the 10.89-acre Waimānalo, O`ahu Property, behind all existing structures (see Figure 6: Site Plan). The primary objective is to create a unified and permanent site to support HMK programs and accommodate MHPCS. Currently, MHPCS operates across multiple locations in Waimānalo, while serving kindergarten to grade 8, which is not beneficial for students or staff. The proposed Project aims to consolidate the existing classrooms, along with a single pre-kindergarten classroom, into a village-style layout of classroom pods, creating a close-knit community and tranquil interconnection with adjacent open spaces that offer views of the Ko'olau Mountain Range.

The proposed Project is focused on creating a space that honors the mission and goals of HMK and MHPCS, supporting opportunities for collaborative learning and activities directly applicable to the Waimānalo environment. The physical building design ensures flexible use of space to accommodate outdoor education, experiential learning opportunities, and place-based education lessons that model sustainable living practices. Recognizing that learning should not solely occur in an enclosed classroom and applying lessons learned during the COVID pandemic, a portion of the classroom pods are open to allow for covered outdoor learning, and cross-collaboration with ample outdoor space adjacent to each building as a way to facilitate connection to the environment. The adjacent and surrounding landscape will be propagated with endemic, Polynesian-introduced, and other plants of cultural and sustenance value in Hawai'i.

This small-scale village layout design ensures the preservation of open space for outdoor learning, while also retaining the existing open lawn at the front of the Property. The proposed Project will be developed behind the existing facilities, maintaining the existing Property view plane from the street front while enhancing the application of Hawaiian values and project-based learning towards the rear of the Property that will foster the growth and development of Hawaii's future leaders and change makers.

The material and style used for the building will blend in with the natural vegetation of the area and create a smooth transition from classroom to outdoors. These materials will include wood/faux wood and earthy gray/brown paint while the style is akin to agricultural buildings and modern cabins. All buildings will have sloped shed roofs with high ceilings and all but the shared kitchen facility will be built using an elevated post and pier structure in response to the potential flooding in the area. The shared kitchen facility will likely consist of a poured concrete foundation.

The MHPCS structures include six (6) classroom building pods to support pre-kindergarten through Grade 8 and one (1) ancillary facility to host restrooms and administrative offices. This represents an increase of one (1) grade level or one (1) classroom (preschool) compared to the recent SY 2022/2023 enrollment ranging from kindergarten to grade 8. In total, the school aims to support enrollment of up to 230 students (a max enrollment of 23 students per grade level), a maximum of up to 70 more students than the current 160 enrollment.

The HMK structures include (4) wood-framed 30-foot diameter yurts within the Project Area, located immediately adjacent to the shared pavilion and kitchen. These long-anticipated yurts will exclusively

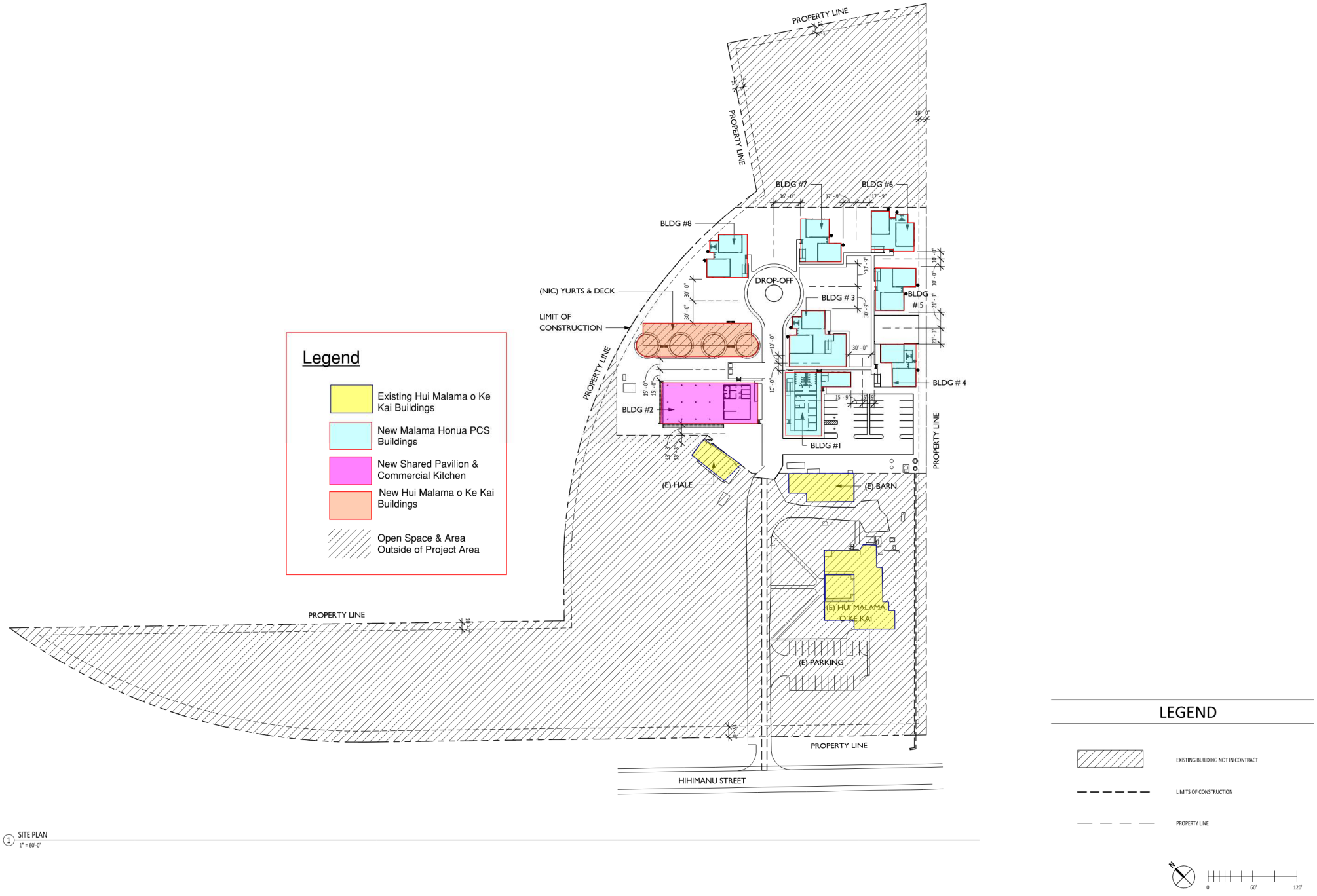


Figure 6: Site Plan

support HMK's existing programs and activities, and serve as a COVID pandemic-related improvement by providing additional space that allows opportunities for physical distancing while providing permanent cover and protection from the elements.

Together, HMK and MHPCS will share an open-air pavilion with a commercial kitchen that can be used for students, participants, and related community programming. This shared pavilion will support both organizations and future partner activities.

In total, the Project proposes approximately 22,767 SF of additional floor area (14,756 SF of classroom and administrative space to support MHPCS; 2,828 SF of new yurt space to support HMK; and 5,183 SF to support shared facilities).

A summary of each structure is provided below. A cross-section of each building and the illustrative image is provided in Figure 7a to 7f: View of Buildings:

(1) Multi-Purpose Open-Air Pavilion and Enclosed Commercial Kitchen (see Figure 7b):

The proposed multi-purpose pavilion covers an area of 5,183 square feet and consists of two main sections, an open-air Pavilion, and an enclosed commercial kitchen.

a. Certified Commercial Kitchen:
    - Size: 1,641 square feet
    - Purpose: The certified commercial kitchen will focus on on-site food processing, and production, and support economic development potential.
    - Facilities: It includes the necessary equipment and space for a commercial kitchen, prep area, and storage areas to safely cater to staff, students, program participants, and community guests.

b. Covered Outdoor Deck/Multi-Purpose Space:
    - Size: 3,542 square feet
    - Purpose: This open-air space will serve as a versatile space for various activities, including community events, hosting food service, and educational activities.
    - Capacity: This space can accommodate up to 300 people.
    - Features: The deck has an open-air, open-area layout with wooden decking and an exposed wood roof structure, providing a rustic and natural aesthetic.
    - Views: It offers views of the open space, the HMK Hale, and the Ko'olau Mountain Range.
    - Ceiling Height: The lowest point of the ceiling is 10 feet and the highest point is 16 feet.

The foundation system for the Multi-Purpose Pavilion will likely include a raised concrete slab-on-grade and other wood-framed floor systems specifically rated for exterior use.

(4) Yurts for HMK use (see Figures 7e and 7f):

As part of the proposed Project, four (4) identical, 707 SF, 30-foot diameter wood-framed yurts will be installed, along with a surrounding wood deck and ramp access. These yurts will support HMK's existing programmatic activities. Key details include:

- Yurt Design: Each yurt features a 14.6-foot-tall lattice wall frame covered with yurt fabric, providing a unique and flexible structure. Each Yurt includes 28 oversized 4'x4' windows for panoramic 360 views and optimal airflow including a front and back door.
- Yurt Footers: To support the yurt structure, 30 concrete footers will be installed.
- Roof Design: The roof of each yurt includes a cast acrylic clear dome at the center, adding natural light into the interior with windows and doors offering natural ventilation to enhance the overall comfort and low-energy use.

These yurts and the accompanying wood deck will create versatile and functional spaces to accommodate HMK's programmatic activities and serve as a COVID pandemic-related improvement by providing additional space that allows opportunities for physical distancing while providing permanent cover and protection from natural elements.

(6) classroom pods for MHPCS use (see Figures 7c and 7d):

The proposed Project consists of classroom pods designed to accommodate 2-classrooms per pod, with each classroom serving one (1) grade level from pre-kindergarten to grade 8 with a maximum of up to 23 students per grade level. For example, a classroom pod will be home to grade 1 and grade 2, while another classroom pod will be home to grade 3 and grade 4, and so on. Each classroom is approximately 763 SF. Key details include:

- Classroom Pod Structure: Each classroom pod comprises two classrooms connected by an outdoor covered lanai. This design allows for indoor and outdoor learning, cultural protocol activities, and provides covered space for continuous learning during inclement weather, and supports learning through future health-related issues similar to the COVID pandemic.
- Classroom Pod Design and Size Variation: There are two (2) pod designs - "Type A" classroom pods have two handwashing stations and a building footprint of 2,434 SF and "Type B" classroom pods with two handwashing stations and two unisex restrooms with a building footprint of 2,709 SF.
- Grade Levels: Five classroom pods will serve ten grade levels (2 classrooms per pod), from pre-kindergarten through Grade 8. The remaining classroom pod will support enrichment classes.
- Natural Ventilation and Lighting: Each classroom has large openings and high ceilings to facilitate natural ventilation and the use of natural lighting. This design feature reduces energy requirements and creates a comfortable environment for learning without requiring artificial light or air.
- Covered Gathering Spaces: Each classroom pod includes a large gathering space covered by a wood trellis. The deck supports cultural protocol activities and outdoor learning opportunities.
- Foundation System: The foundation system will utilize post and pier foundations with concrete footings. The footings will be designed to withstand applicable gravity, wind, and seismic loads. The foundation system will also reflect flood-related requirements.
- Outdoor Play Area: There will be a fenced, unobstructed outdoor play area located adjacent to the pre-kindergarten and kindergarten classroom pod, there.

(1) Ancillary Administrative Office for MHPCS
The administrative building, covering a building footprint of 3,275 square feet, will serve as the central hub for MHPCS operations. Key components of the office include:

- Building Components: The building will include the following:
    - MHPCS Reception Desk
    - Four (4) individual staff offices
    - A health room
    - Copy/storage room
    - Dedicated restroom for staff
    - Primary student restroom area
    - A staff meeting room, which can also be used for private family and staff meetings
- Location and visibility: The administrative building is strategically placed as the first structure visible from the entryway for the proposed Project. The pre-kindergarten and Kindergarten pod is directly adjacent to the office as well.
- Parking: The school parking lot will be situated on the southeast side of the administrative office.
- Foundation System: The foundation system for the administrative building will consist of post and pier foundations with concrete footings. The footings will be designed to withstand the applicable gravity, wind, and seismic loads.

By incorporating these features, the administrative building will provide the necessary facilities and spaces to support the administrative functions of MHPCS.

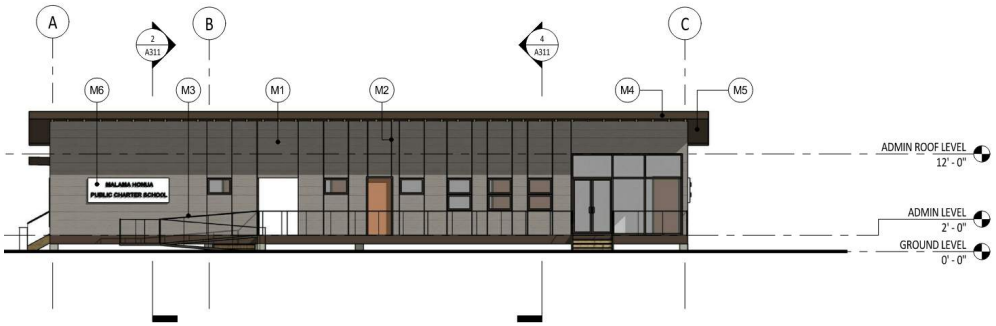
Site - Driveway, Parking, Access, and Landscaping:

Driveway, Parking, and Access:

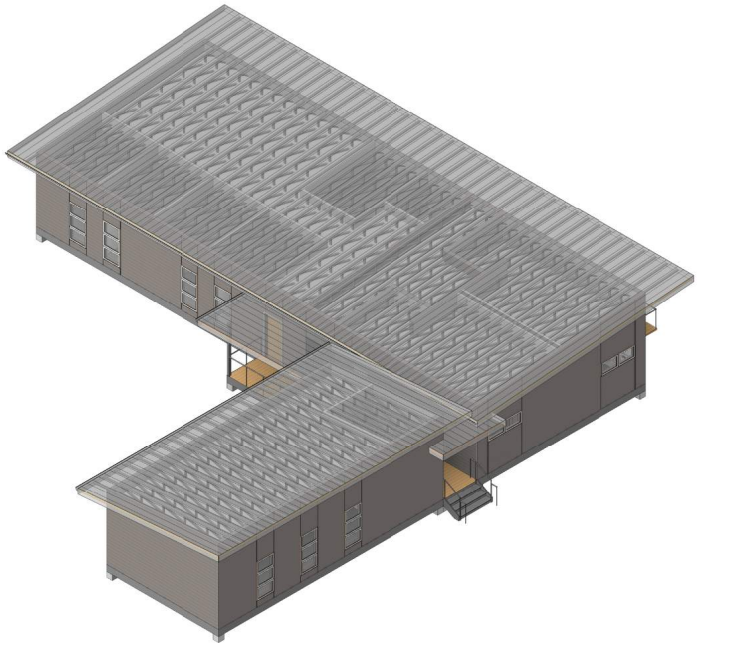
- Roundabout and Drop-Off: The roundabout for drop-off and turnaround purposes will be situated approximately 600 feet from the Hihimanu Street entrance, and over 200 feet beyond the traditional hale.
- Existing Parking for HMK: The current parking area for the existing HMK building will be retained, as-is.
- Proposed Project Parking: Parking specifically for the proposed Project will be located behind the existing buildings, hidden from the street view plane, approximately 400 feet from the Hihimanu Street entrance, and adjacent to the proposed MHPCS Administrative Office.

Landscape Design:

- Design Concept: The landscape design concept aims to create an aesthetically pleasing environment based on function and simplicity. The design prioritizes erosion control, shade provision, and opportunities for hands-on learning and educational development - now and into the future.
- Native Plants: Native Hawaiian and Polynesian-introduced plants (i.e., canoe plants) will be used where possible. These particular plants are ecologically suited for the site and valued for their significance, utilized in cultural protocol and as mea ʻai (food).
- Edible Trees and Aquaponic Gardens: Edible non-invasive trees will be strategically located throughout the campus, and aquaponic gardens will continue to serve as a resource for school activities and future meals.
- Entryway Design: Coconut palm seedlings will be planted at the entry to signify the campus entrance and blend with existing and future garden plants located on the site.



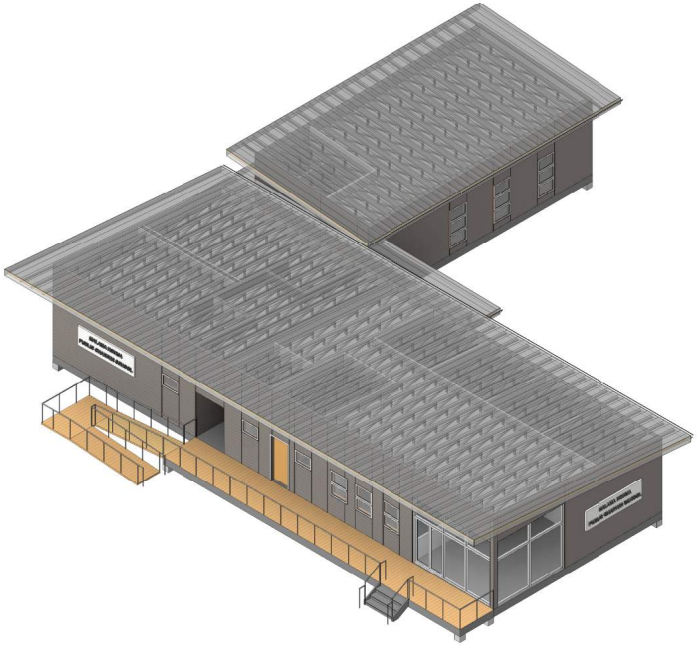
ADMIN BUILDING_FRONT ELEVATION
1/8" = 1'-0"



2 OVERALL VIEW 2

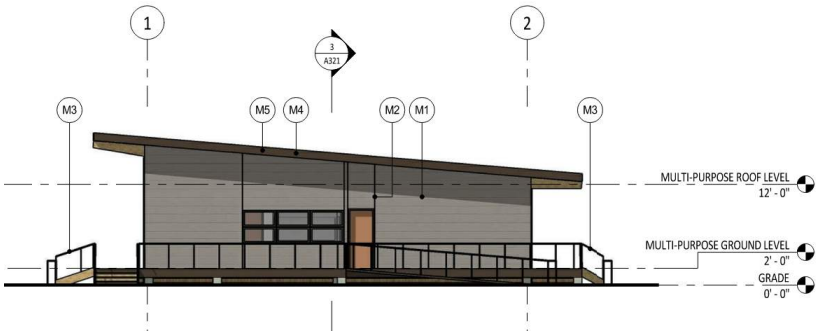
4 FRONT EXTERIOR VIEW

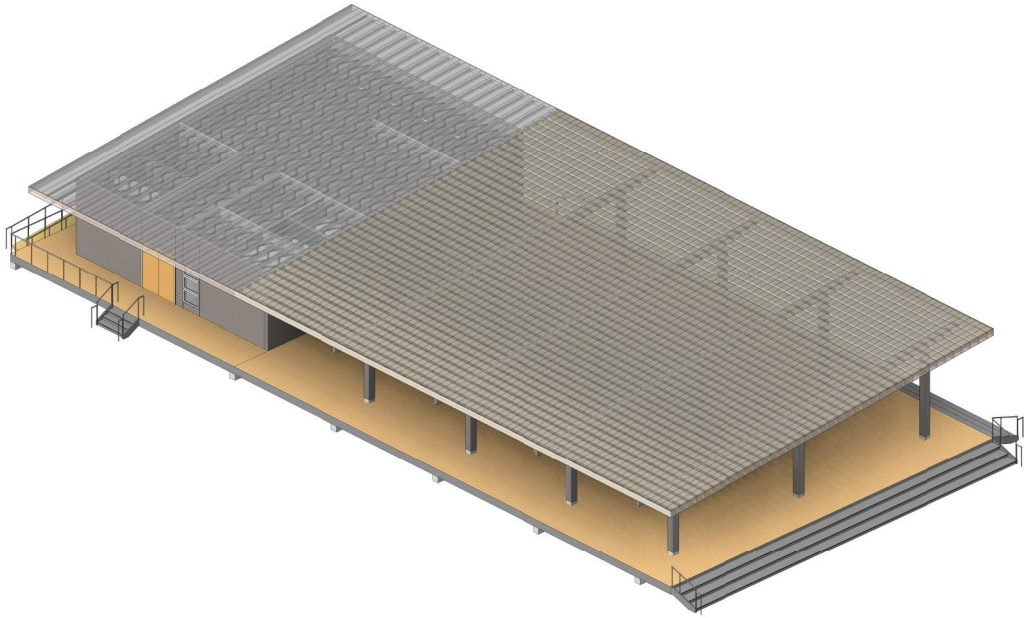
3 OFFICE VIEW



1 OVERALL VIEW

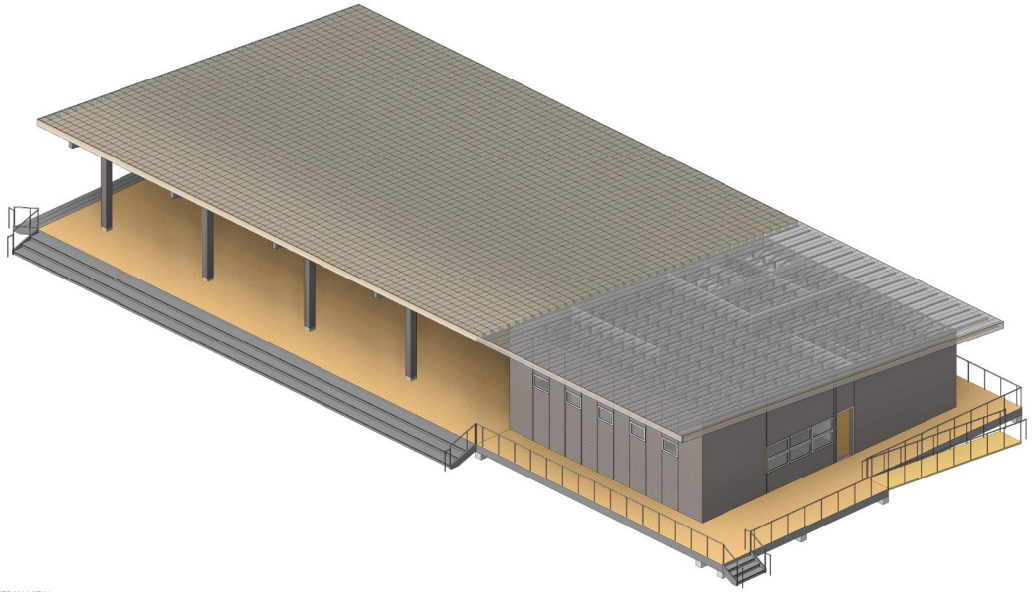
Figure 7a: Views of Building 1: Administrative Building





2 OVERALL VIEW REAR

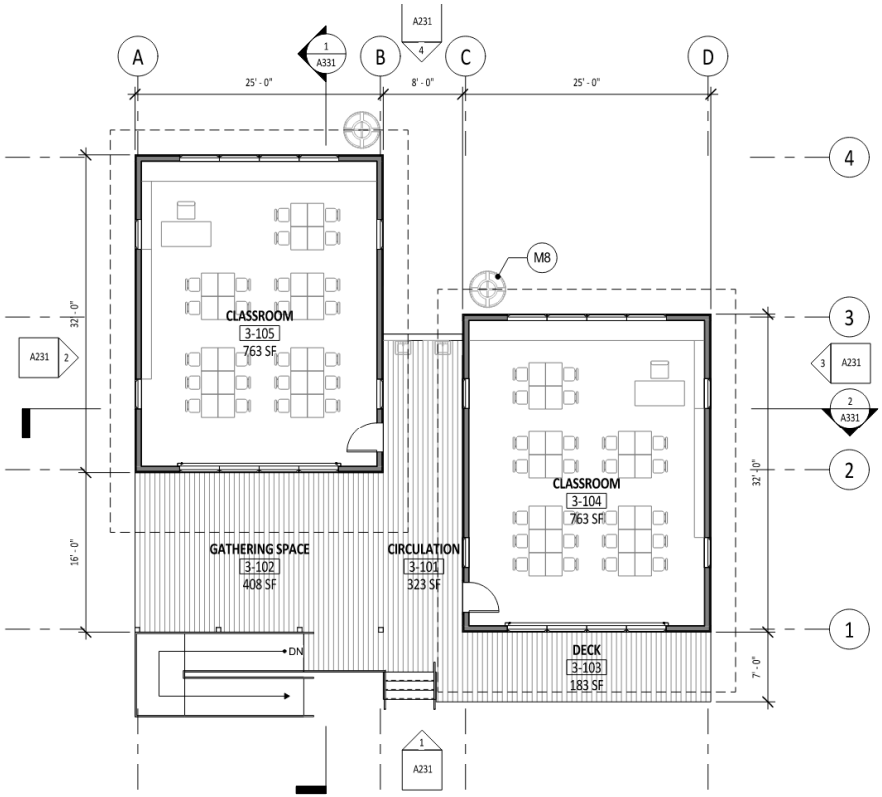
4 EXTERIOR VIEW



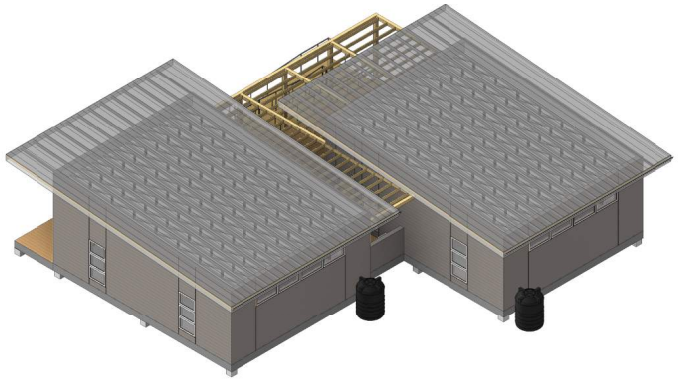
3 MULTI-PURPOSE VIEW

1 OVERALL VIEW

Figure 7b: Views of Building 2 - Multi-Purpose Pavilion & Kitchen

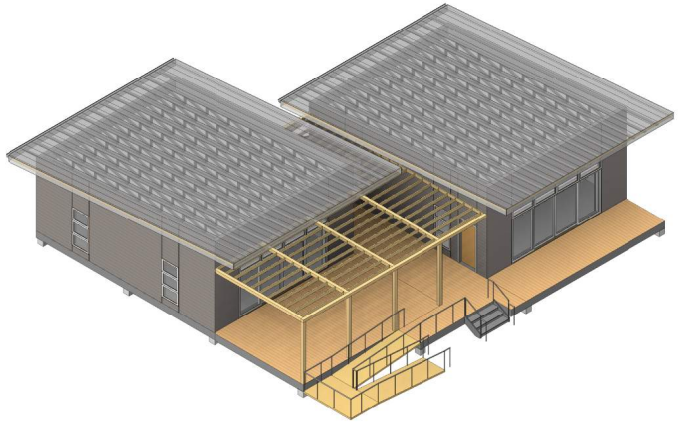


1 CLASSROOM BUILDING TYPE A_FLOOR PLAN
1/8" = 1'-0"



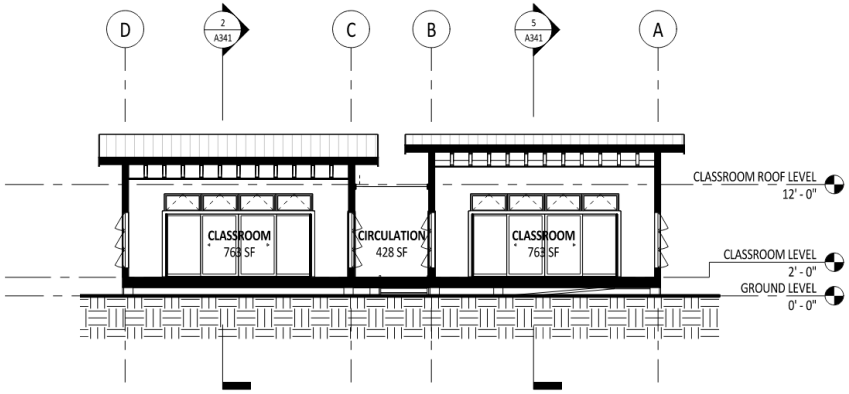
2 OVERALL VIEW REAR

3 GATHERING SPACE

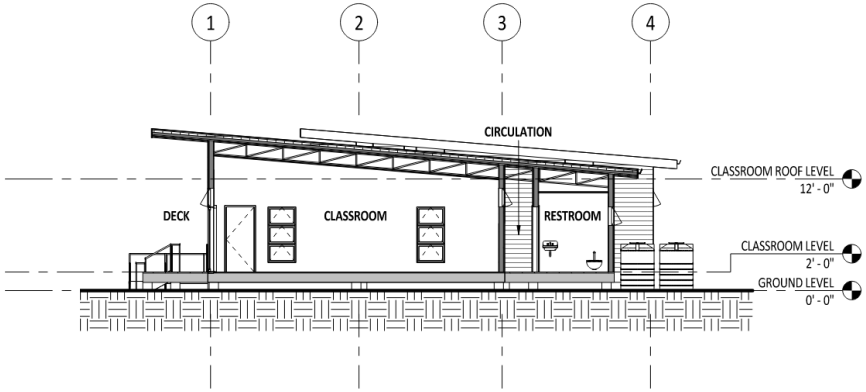


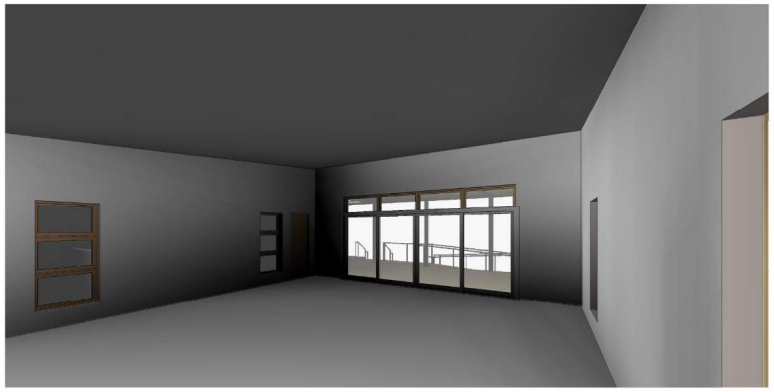
1 OVERALL VIEW

Figure 7c: Views of Building 3 - Classroom Pod (no restrooms)

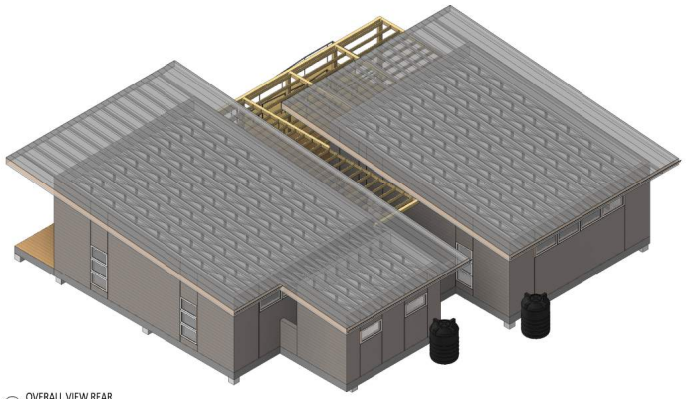


3 CLASSROOM BUILDING TYPE B_LONGITUDINAL SECTION
1/8" = 1'-0"

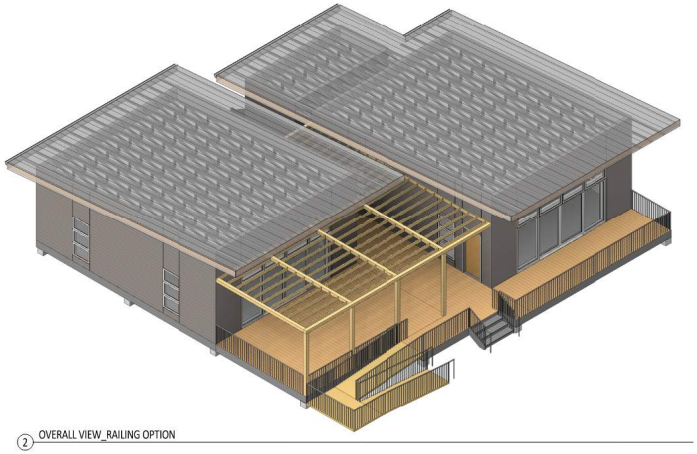




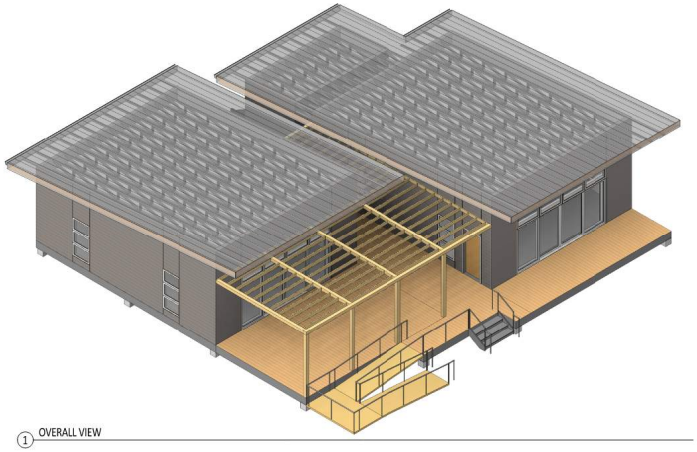
4 CLASSROOM VIEW



3 OVERALL VIEW REAR

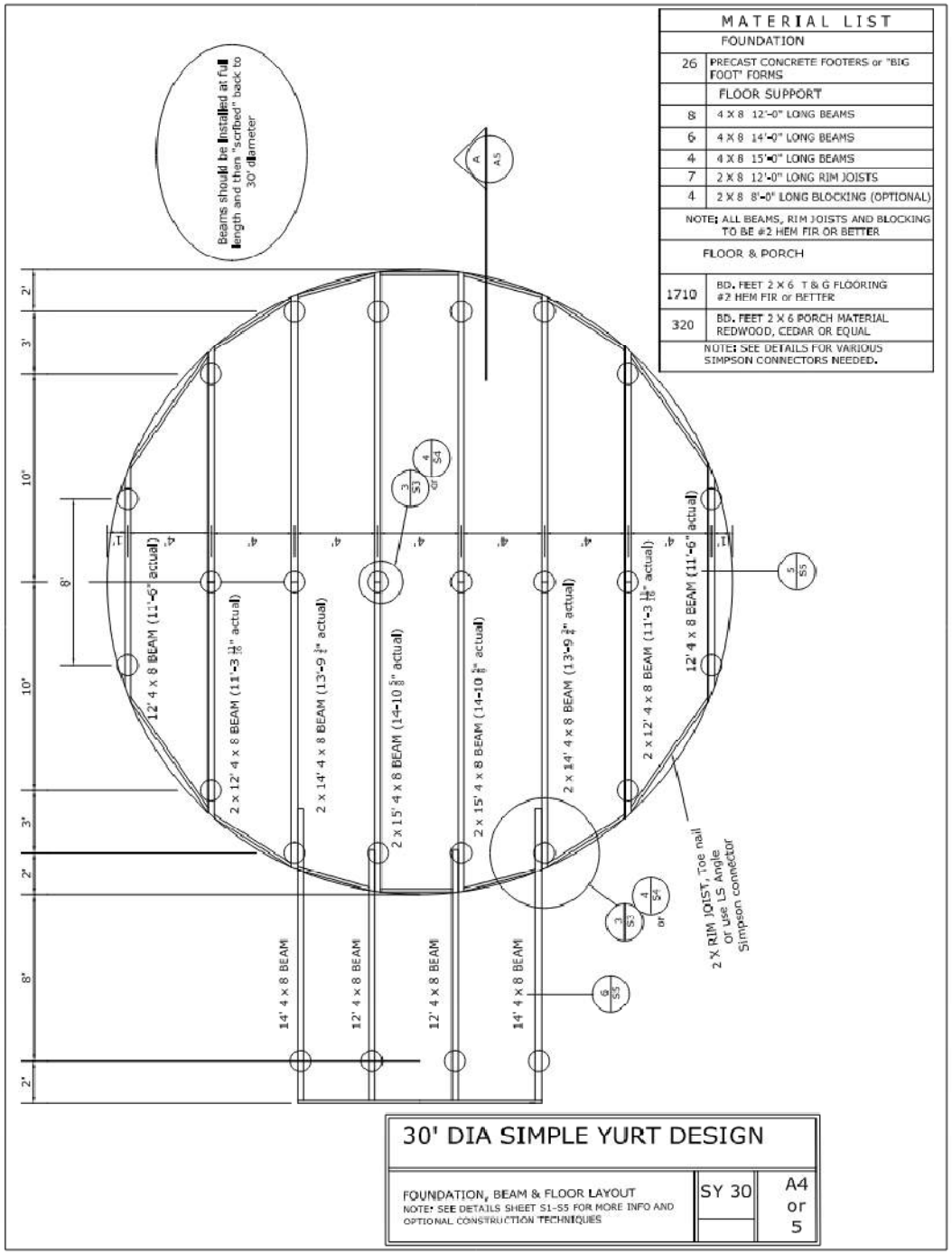


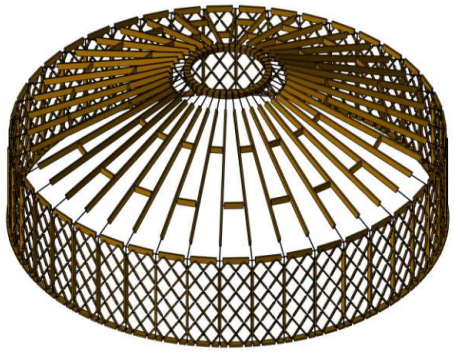
2 OVERALL VIEW_RAILING OPTION



1 OVERALL VIEW

Figure 7d: Views of Building 4 - Classroom Pod with restrooms





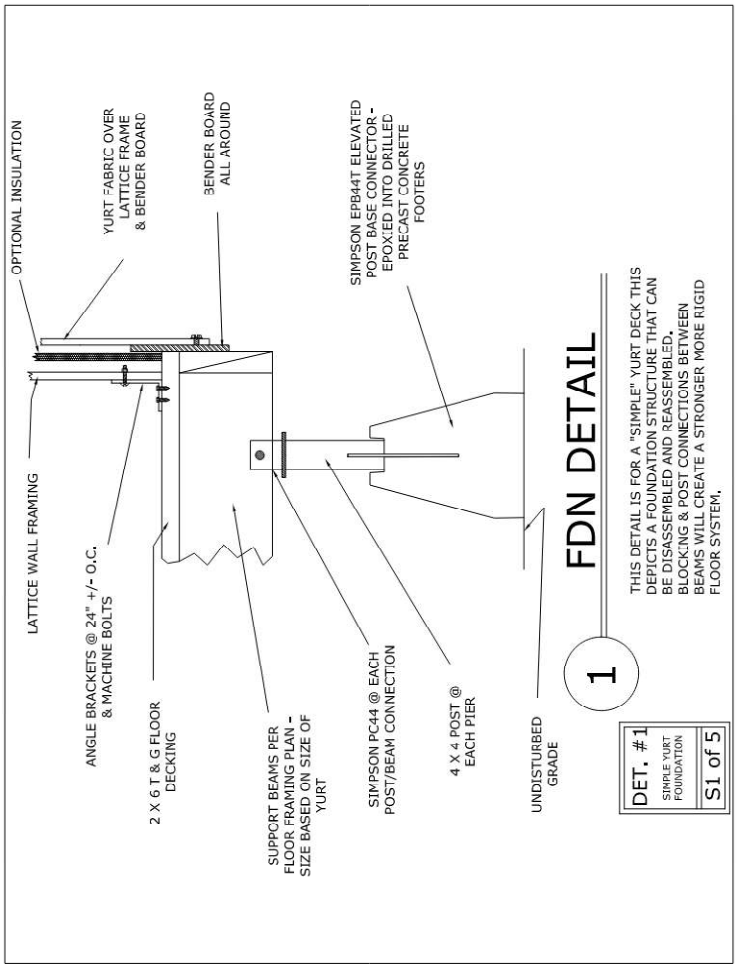


Figure 7f: HMK Yurt - Details

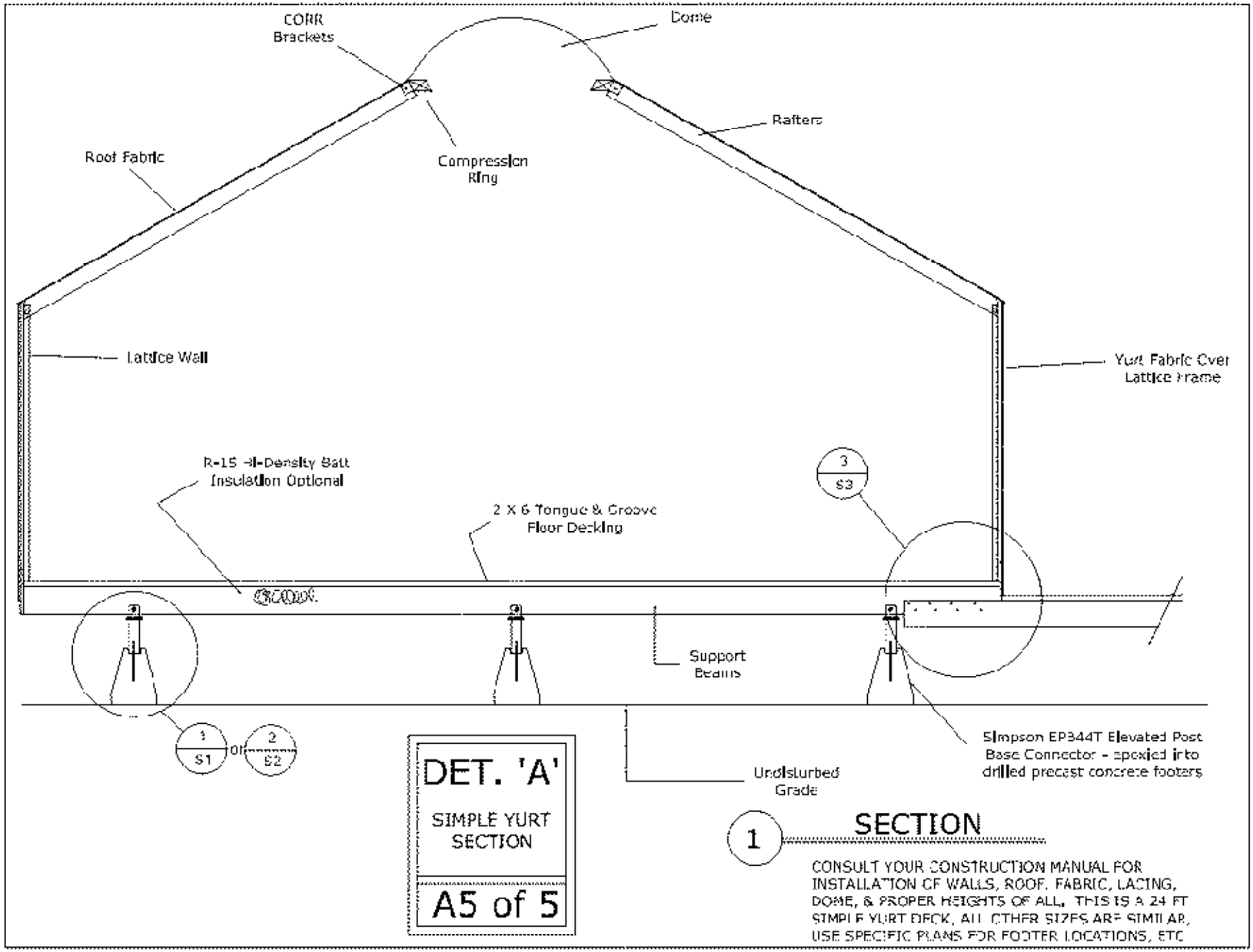


Figure 7e: HMK Yurt – Cross-Section

Site Demolition and Work:

- Demolition Work: The existing invasive vegetation within the Project Area will be removed as part of the site demolition work.
- Site Work: The site work includes grading, installation of new utility connections, and construction of concrete walkways, gravel road, and parking lot.
- ADA Accessibility: The layout, dimensions, and slopes of the concrete walkways will adhere to ADA Accessibility Guidelines to the maximum extent practicable.

By implementing these plans, the proposed Project aims to minimize its visual impact, reduce congestion by locating the drop-off turnaround area 600 feet from the Property entrance, optimizing parking and driveway flow, while also ensuring compliance with accessibility guidelines for a functional and inclusive campus environment.

2.5. Infrastructure Assessment

The proposed Project will necessitate additional infrastructure improvements to accommodate accessibility and utility usage. Furthermore, landscaping enhancements will be implemented to improve the overall appearance of the facilities, with a focus on energy efficiency and the utilization of renewable resources whenever possible.

Water System:

- Domestic Service: Domestic water service for the Project will be connected to an existing 8-inch City and County of Honolulu Board of Water Supply (BWS) water main along Hihimanu Street, which borders the Project Area.
- Fire Protection: Fire protection for the Project will be provided through the installation of a new onsite fire hydrant. Separate from the domestic potable service, the fire protection system will be connected to existing BWS infrastructure along the Hihimanu Street frontage of the Property via a 6-inch diameter lateral.

By implementing these infrastructure improvements, the Project aims to ensure a reliable water supply for domestic use and fire protection. The utilization of existing water infrastructure and the integration of sustainable landscaping practices (i.e., rain cisterns) contribute to the overall sustainability and efficiency of the Project.

Sanitary Sewer System (See Figure 8: Sewer Utilities Map):

- Existing Infrastructure: A City sewer main is located along Hihimanu Street. The existing city sewer system serves the existing HMK structures.
- New Pressure Sewer Connection: The proposed Project may require a new on-site pressure sewer connection to serve the proposed Project. A Sewer Connection Application (SCA) will be submitted to the City for review and approval.
- Private Sewer Connection: The new pressure sewer connection will connect to a privately owned 4-inch diameter pressure sewer main. This private sewer connects to the City and County of Honolulu sewer system approximately 1,500 linear feet from the Property.

Figure 8: Sewer Utilities Map (DPP, 2018)

By establishing a new pressure sewer connection, the Project aims to ensure the proper functioning of the sewer system. These improvements will facilitate the integration of the Project with the existing sewer infrastructure and support the future needs of the Project.

Drainage and Stormwater:
Preservation of Existing Drainage: The proposed Project aims to preserve the existing drainage pattern. Site grading will be implemented to direct excess runoff toward the existing drainage swale along the eastern portion of the Property.

Electrical Distribution System:
The proposed Project will require electric service to be obtained from an existing 3' x 5' handhole located near the existing Hawaiian Electric Company, Inc. (HECO) transformer on the adjacent site. To support the proposed Project, new electrical infrastructure will be installed within the Project Area, including a new HECO pad-mounted transformer, meter, service equipment, and a new distribution panel.

The estimated total load for the Project is 87 connected kilovolt-amperes (KVA), with a demand of 72.5 KVA. This indicates the amount of power required to meet the electrical needs of the Project, taking into account both connected equipment and the peak power demand.

By connecting to the existing electrical infrastructure and installing the necessary equipment within the Project Area, the proposed Project will ensure a reliable and sufficient supply of electricity to support HMK and MHPCS operations.

Telecommunications System:
The telecommunication infrastructure will be coordinated with MHPCS and HMK telecommunication vendors. Infrastructure will be housed within the Administration building with empty raceways provided to each classroom pod and the Multi-Purpose Pavilion.

Fire Alarm System:
A manual fire alarm system will be installed. Manual fire alarm pull stations will be provided within the Classroom Pods, Multi-Purpose Pavilion, and Administrative Building exits along with audio-visual fire alarm devices in all occupied rooms.

Fire Protection:
Fire protection for the Project shall be provided via a new onsite fire hydrant and connection fire sprinkler system. The fire protection line is anticipated to connect to the existing BWS infrastructure along Hihimanu Street.

2.6. Timing and Project Schedule

The Applicants aim to commence construction of the proposed Project in early 2024 and aim to substantially complete it by late fall of the same year, aligning with the start of the 2nd semester of the SY 2024/2025. However, factors such as economic conditions, entitlement delays, funding availability, and construction delays could potentially extend the Project timeline.

The Project timeframe to complete the construction is intended to be a single continuous phase, with an estimated duration of approximately 10 months from start to end. Based on historical efforts to establish a permanent location for MHPCS, both HMK, and MHPCS are eager to work through the entitlement, planning, and construction of the proposed Project.

2.7. Permits and Approvals

Permits and approvals required for the Project and approving authorities are listed below. Additional permits and approvals may be required pending final construction plans.

State of Hawai‘i:
Department of Health

- Community Noise Permit
- National Pollutant Discharge Elimination System Permit (NPDES)
- Sanitation Food Safety

City and County of Honolulu
Board of Water Supply:

- Building Permit and Construction Plan Review

Department of Planning and Permitting

- Building Permit for Building, Electrical, Plumbing, Sidewalk/Driveway, and Demolition work
- Conditional Use Permit Approval
- Floodway Permit
- Grubbing Grading, and Stockpiling Permit
- Sewer Connection Application

Department of Transportation Services

- Street Usage Permit

Honolulu Fire Department:

- Plan check

3. Proposed Action and Alternatives

3.1. Proposed Action - Objective and Need for Action

The collaboration between HMK and MHPCS brings significant value, not only in terms of infrastructure improvements but also in addressing the multiple risk factors and challenges faced by Native Hawaiian children. Native Hawaiian youth are at risk for various health and social issues, and strengthening their connection with their families and community can positively impact their development and help them escape generational socio-economic issues through educational opportunities and career success.

By integrating conventional academic subjects with culture-based, place-based, and ‘āina-based approaches, the collective on-site opportunities offered by HMK and MHPCS programs encourage environmental awareness, cultural identity, problem-solving skills, collaboration, civic responsibility, and

a global perspective among the youth and their families. These attributes are crucial for the future leaders of the State of Hawai‘i and the community.

The proposed Project aligns with the State's goals of providing culturally grounded education and utilizing the environment and cultural practices to benefit the community and State (HRS §226-21). The Project aims to create citizens who advocate for healthy lands and provide physical spaces for students to explore, learn, and develop solutions to environmental challenges. It facilitates an integrated and cross-disciplinary approach, grounded in ‘ike (to see, know, feel) Hawai‘i, that engages students, families, and the community in various learning opportunities.

The EA ensures compliance with applicable regulations and highlights that the proposed Project will utilize vacant land that has not provided significant natural, cultural, or historic resources. The facilities and spaces proposed to support the existing programs are expected to have a positive impact by addressing social, environmental, and cultural challenges and needs. Additionally, the applicants and proposed uses create positive change for the ‘āina, the Waimānalo community, and the overall well-being of the students while strengthening individual cultural identity and competence.

Overall, the proposed Project aims to create an inclusive and empowering learning environment that fosters the growth and success of Native Hawaiian children, preparing them to become future leaders who will make a positive difference in their communities and the world. The focus on environmental sustainability is also consistent with the mission of the State DLNR, the Fee Owner of the land.

3.2. Alternative A: Delayed Action

Since its founding in 2014, MHPCSF has been diligently exploring viable land options in Waimānalo to meet the needs of MHPCS. The selection of the proposed location was a result of discussion and consensus among the community of stakeholders. Before the subject Property, the school conducted a thorough evaluation of sixteen available and potentially available alternative sites within the Waimānalo community for the last nine (9) years. In fact, in 2019, design plans were even completed for another potential location. This dedicated effort demonstrates MHPCS's commitment to finding the most suitable and beneficial site for both its purpose and the Waimānalo community.

As an example, alternative locations included the Waimānalo Beach Lots, which are generally small residential lots with extremely high per-square-foot costs. There were also prime agricultural lands that some community members were adamant about preserving for commercial agriculture ventures. Additionally, shared spaces with religious groups were considered, but they often occupied prime agricultural lands or were smaller in size than the minimum two-acre size requirement to accommodate the school. Other vacant properties were located in flood zone areas known to regularly flood.

The prolonged search for a permanent site has for nearly a decade resulted in delayed or deferred action for MHPSF, hindering the establishment of a permanent site for MHPCS. Continuing with this approach would further postpone the timeline to construct a suitable campus for MHPCS and continue the status quo and no action alternative.

For HMK, a delayed action will also continue the status quo and no action alternative, making do with the existing structures.

The completion of the EA process will help to move the Project forward and provide a permanent home for MHPCS and allow HMK to complete much-needed operational and pandemic-related improvements to improve the physical space for its programs and activities.

3.3. Alternative B: Status Quo

The “Status Quo” Alternative refers to the scenario in which HMK would continue to operate within its existing facilities, of which the main building was built almost 40 years ago. Similarly, MHPCS would continue to operate its school from multiple satellite sites scattered throughout Waimānalo. This arrangement would result in the school being physically divided by grade level and lacking a long-term, cohesive site.

Operating under the Status Quo Alternative means that HMK and MHPCS would continue to face the challenges associated with their current setup. These challenges include limited space, inadequate and aging facilities, logistical issues, and the inability to provide a cohesive educational environment for students and participants.

Maintaining the status quo would prevent the consolidation of resources, effective collaboration between the programs, and the creation of a unified site that can better serve the needs of both HMK and MHPCS students. It would also hinder the ability to implement higher quality cultural education by limiting facility improvements and hindering the physical progress to address specific challenges faced by the Native Hawaiian population.

The proposed Project aims to address these limitations and provide an improved and permanent site for both HMK and MHPCS, allowing them to operate more efficiently, improve educational outcomes, and create a cohesive learning environment for their students.

3.4. Alternative C: No Action

The "No action" alternative, similar to the status quo alternative, refers to the option of leaving the Property in its current condition without improvements or implementing the proposed Project. Under this alternative, there would be no collaboration between HMK and MHPCS, and the Project Area would remain vacant and overgrown with invasive vegetation.

Choosing the "No action" alternative would mean foregoing the opportunity to provide a permanent location for ʻāina-based education rooted in Hawaiian cultural perspectives and understanding. It would also result in HMK continuing to operate as it has for over three decades, without any major improvements or advancements that improve the facility and permanently address pandemic-related protocols.

By forgoing the proposed Project, the community would not benefit from the beneficial impacts that could be achieved through the improvements and collaboration between HMK and MHPCS. These positive impacts may include improved educational opportunities, a cohesive learning environment, and the preservation and promotion of Hawaiian cultural practices.

Additionally, the "No action" alternative may lead to potential hazards to natural resources, as well as facilitate greater potential for vagrancy or illegal dumping within the Project Area that is currently vacant and overgrown. It would not address the stated objectives of the Project, which aim to serve the

youth in Waimānalo and Windward Oʻahu and create a permanent location for culturally-grounded education.

Overall, choosing the "No action" alternative would result in missed opportunities for community development, educational advancement, and the fulfillment of the Project's objectives.

4. Environmental Considerations

The recognition and incorporation of traditional ecological knowledge, or ʻike kūpuna (ancestral wisdom), is a fundamental aspect of MHPCS and HMK's mission and approach. Native Hawaiians have a deep connection to the land, water, and natural resources, and their traditional practices and knowledge have sustained their communities for generations.

By embracing 'ike kūpuna and incorporating traditional ecological knowledge into their programs, activities, and actions, MHPCS and HMK aim to honor and preserve indigenous Hawaiian perspectives and understanding. This includes fostering a sense of harmony and balance with the natural world, recognizing the interdependence of all living beings and ecosystems, and promoting sustainable practices that ensure the long-term health of the land, water, and cultural heritage.

By integrating traditional ecological knowledge into their educational approach, MHPCS and HMK seek to empower students and participants with a deep understanding of their cultural identity, a strong connection to their ancestral lands, and the skills and values needed to advocate for the health and well-being of the environment and home. This approach not only preserves and celebrates indigenous wisdom and innovation but also equips the next generation of leaders with the tools to address the complex environmental and cultural challenges of the present and future.

The following is a discussion of the environmental settings and potential impacts and mitigation measures.

4.1. Climate and Climate Change

Climate

The climate in Hawaiʻi is generally characterized by a two-season year: the summer period is warm and dry whereas the winter season is cool and wet. Rainfall distribution across Hawaiʻi varies greatly according to geographic conditions, elevation, and long-term climatic cycles. For example, the climate in Waimānalo ranges from hot and dry along the shore to wet and cool at higher elevations.

The overall climate in the Waimānalo region is typically mild and uniform, with an average annual temperature of 74 degrees Fahrenheit. Temperatures in the vicinity of the Project Area range from approximately 71 degrees Fahrenheit in January and February to approximately 78 degrees Fahrenheit in August (Giambelluca, 2014). Trade winds in the vicinity are generally from the northeast. Strong winds are known to occur in connection with storm systems. The wind of Waimānalo is called Limulipu'upu'u and prevails from the northeast (DHHL, 2012).

The Rainfall Atlas of Hawaiʻi tracks rainfall across the state with the nearest rainfall data tracked less than a mile away at the University of Hawaiʻi, “Waimānalo Exp” site located at the 60-foot elevation, somewhat higher in elevation than the Project Area. Here, the mean annual rainfall based on a record

period from 1950 to the Present is 42.1 inches per year. At this tracking site, the highest rainfall occurs between November and January ranging from 6.06 to 6.57 inches per month. Based on the same available data set, the lowest rainfall recorded occurs from June to August, ranging from 1.3 to 1.7 inches per month, coinciding with the island's dry season. (UH, 2023)

Air quality

Air quality in the State of Hawai'i consistently meets National Ambient Air Quality Standards (NAAQS) established by the U.S. Environmental Protection Agency per requirements of the Clean Air Act and State Ambient Air Quality Standards (SAAQS) established by the DOH. The NAAQS and SAAQS are periodically exceeded due to volcanic activity and exceptional events such as New Year's fireworks celebrations.

The Project Area is located within a rural area characterized by low-density residential land uses. The ambient air quality in and around the Project Area is likely to be influenced by emissions from vehicular travel along Kalaniana'ole Highway and Hihimanu Street, surrounding human activities, and natural pollutants such as plant pollens and soil-related particulate in the air. The prevailing trade winds help to circulate and disperse emissions and other airborne pollutants.

Climate Change and Sea Level Rise (SLR)

The well-established worldwide warming trend of recent decades and its related impacts are caused by increasing concentrations of carbon dioxide and other greenhouse gases in the Earth's atmosphere (HCCDA, 2020). Climate change will affect people, property, the economy, and ecosystems in a variety of ways. Consequences of climate change include increased flood vulnerability and increased heat-related illnesses. Climate change will have a measurable impact on the occurrence and severity of natural hazards.

A 2014 University of Hawaii study noted the following trends (HCCDA, 2020):

- 70 percent of the beaches have eroded and over 13 miles of beach have been completely lost to erosion in the last century. Additionally, many of the state's coastlines are experiencing shoreline retreat, with an average of 1 foot lost per year, wetland migration, and cliff collapse.
- Low coastal areas have experienced more frequent flooding due to elevated groundwater tables, which have increased partially due to sea-level rise.
- Tropical cyclones are occurring more frequently, with more having developed from Pacific storms between 1991 and 2010 than in the last century
- Hawai'i has recorded a decrease in prevailing northeasterly trade winds in the last 40 years; these winds drive precipitation on windward coasts.
- There has been an overall decline in rainfall in the last 30 years, leading scientists to expect droughts and heavy rains more frequently leading to flash flooding, infrastructure damage, runoff, and sedimentation. In addition, the decrease in rainfall levels has also led to a decline in stream base flow over the last 70 years, influencing aquatic and riparian ecosystems, local agriculture, and aquifer recharge and freshwater supplies.

The 2014 study also stated that climate change impacts are not limited to just physical impacts, however; they can also create social, cultural, and economic impacts. Threats to food and water security, infrastructure, health, and safety could lead to increased human migration away from the

islands or towards higher land, decreasing tourism and making it more difficult for unique regional customs, beliefs, and languages to endure. Additionally, native plants and animals, particularly those in high-elevation ecosystems or experiencing increased exposure to invasive species, face higher stresses and a greater risk of extinction (HCCDA, 2020).

The Hawai‘i State Legislature passed a law (SB 2745) in 2012 that amends the State Planning Act to include climate change as one of the priority guidelines. In 2014, the Hawai‘i State Legislature passed the Hawai‘i Climate Adaptation Initiative Act (Act 83). The purpose of the act is to address the effect of climate change by implementing a climate adaptation plan. In 2017, the Hawai‘i Sea Level Rise Vulnerability and Adaptation Report was published to provide a basis for recommendations on reducing exposure and increasing adaptability to the impacts of SLR resulting from human-generated greenhouse gas emissions. Research within the report notes that the intensity and frequency of natural disasters have increased and will continue to do so, and further provides technical projections of areas along the coast that are vulnerable to SLR based on the latest available science. The report finds that for Hawai‘i, with no mitigating actions, 3.2 feet of SLR and its associated erosion, flooding, and waves will have significant impacts on the island’s land, building and land values, residents, structures, and major roadways. Rising sea levels will increase the probability of coastal flooding and erosion, which could damage coastal infrastructure (HCCDA, 2020).

The proposed Project Area is primarily flat, with elevations ranging from 15 to 29 feet above mean sea level throughout the entire site. The Project Area is slightly over a mile from the shoreline and is outside of the SLR Exposure Area (SLRXA) (See Figure 9: Flood Map and Sea Level Rise Viewer) (HCCDA, 2020).

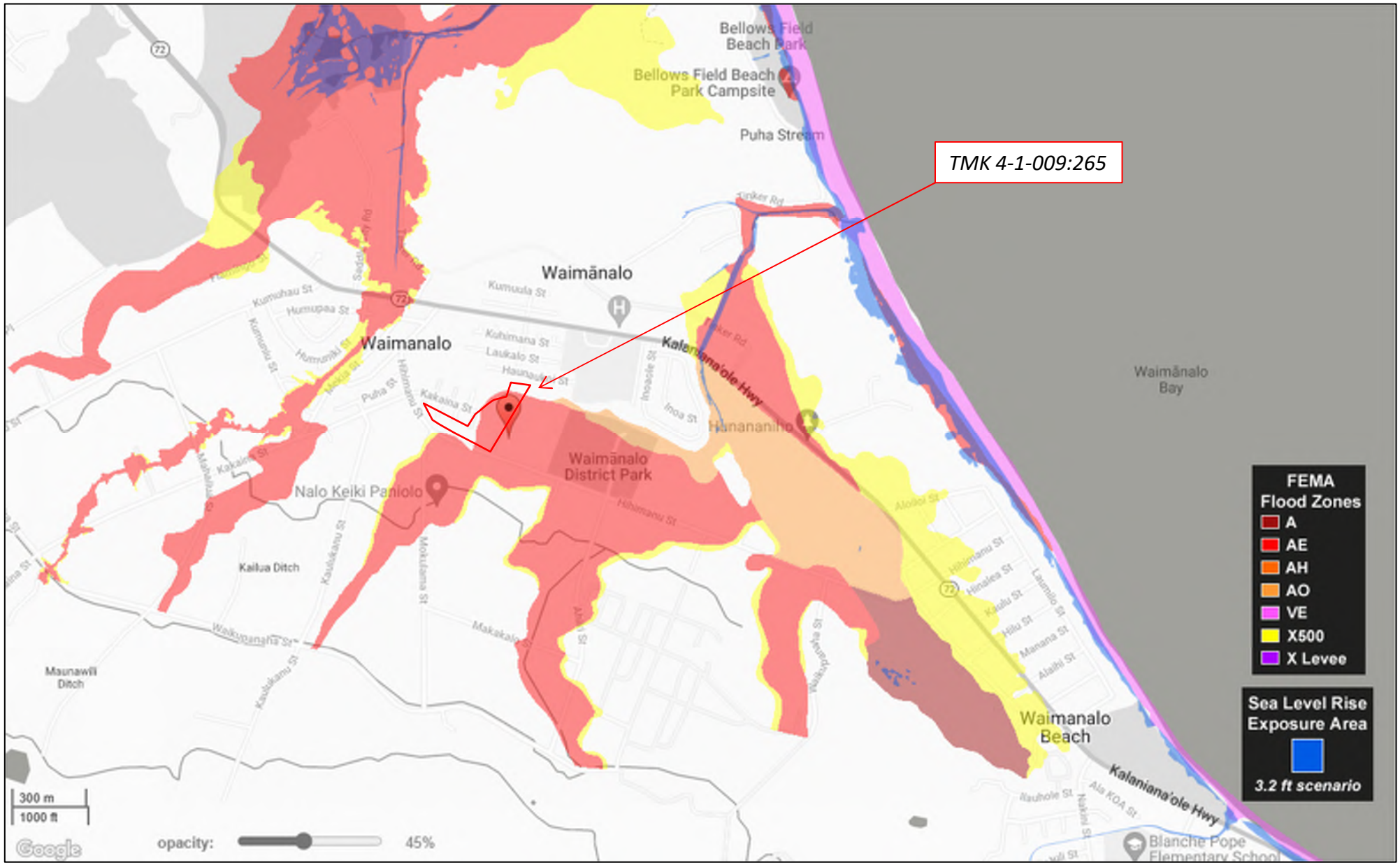
4.1.1. Anticipated Impacts and Proposed Mitigation

While the Proposed Action will have no effect on immediate climate conditions and no mitigation is required, the Project's educational objectives include integrating sustainable living practices and addressing climate change within daily curriculum and activities.

By creating a physical space that accommodates outdoor education, experiential learning opportunities, and place-based education lessons, MHPCS and HMK aim to instill in students a deep understanding of the impacts of climate change and the importance of sustainable practices from a Hawaiian perspective. This approach emphasizes the integration of traditional ecological knowledge, ‘ike kūpuna, and encourages students to become active participants in addressing climate change issues.

While specific mitigation measures may not be required for the Project's immediate climate effects, the Project's focus on education and promoting sustainable living practices align with broader efforts to mitigate and adapt to climate change. By fostering environmental awareness, ethical problem-solving, and a global perspective, the Project aims to equip students with the knowledge and skills to be responsible stewards of the environment and contribute to addressing climate change challenges in their communities and beyond.

Specific to the near term of the proposed Project, typical trade winds ensure that air quality remains within acceptable standards as recorded by the Department of Health air quality monitors. The proposed Project may generate temporary construction-related impacts such as fugitive dust and emissions from construction-related vehicles, equipment, and activities. Fugitive dust concerns fall within the purview of the DOH Clean Air Branch (CAB) Enforcement Section. Airborne, visible fugitive



Source: PacIOOS, 2023

Figure 9: Flood Map & Sea Level Rise Viewer

dust during the various phases of demolition and construction will be controlled at the Project Area by the contractor by Air Pollution Control standards stated in HAR §11-60.1-33, "Fugitive dust." Construction equipment and vehicles shall be properly maintained to control vehicular emissions. Exhaust emissions can be reduced by keeping construction equipment and vehicles properly tuned, maintained, and minimizing unnecessary idle time. Exhaust emissions from construction equipment and vehicles are anticipated to have negligible impacts on air quality in the Project vicinity since the carbon monoxide and nitrogen oxide emissions would be intermittent and readily dissipated.

Overall, air quality impacts during construction will be temporary and will cease upon completion of the construction. No significant adverse air quality is anticipated upon completion and during the operation of the proposed Project.

Climate change and SLR and associated coastal impacts are a concern for the State of Hawai'i and the world and require a comprehensive global response. Construction of the Project would not result nor constitute a source of impact on the climate and does not propose activities that will lead to a measurable increase in greenhouse gases.

The Project will include Best Management Practices (BMP) where practical and feasible. Temporary erosion control measures will be installed before any demolition and/or construction activities. Construction BMPs shall include biofiltration BMPs. Post Construction Best Management Practices (PCBMPs) shall include the implementation of Low-Impact Development (strategies, source control BMPs, and treatment control BMPs) to the maximum extent practicable. An NPDES permit for runoff associated with construction activities will be required for this Project since the overall disturbed area of the Project is anticipated to exceed one acre of land area.

The proposed Project will maximize pervious and landscaped areas to maximize groundwater recharge, or the movement of water through the soil. Dry swales will be utilized throughout the Project Site as well. As a result, storm runoff will be detained on-site to reduce the potential for runoff.

A growing component of healthy communities is resilience. With climate change and natural hazards already impacting communities across Hawai'i, building community resilience and strengthening the connections that support healthy communities are more important than ever. To prepare and build resilience, HMK and MHPCS will have disaster preparedness plans, and assembled emergency supplies.

4.2. Physical Setting (Geology, Topography, & Soils)

Geology:
The Island of O'ahu contains the Waianae and Ko'olau mountain ranges, which are connected by a central plateau. The older Waianae Range spans a distance of about 20 miles across the western third of O'ahu and the younger Ko'olau Range extends approximately 37 miles in a northwest-to-southeast alignment across the eastern two-thirds of the island. The Ko'olau Mountain Range is believed to have formed during the late Tertiary/early Pleistocene time (between 1 and 12 million years ago). Lava flowed from rift zones to form the main shield of the volcano. After the cessation of the volcanic activity, streams cut deep amphitheater-headed valleys into the mountain.

Waimānalo's broad amphitheater-shaped valley has a relatively level floor composed of moderately sloping alluvial fans. The general geology of Waimānalo is characterized by three major geological units: basaltic bedrock, alluvium, and coralline deposits.

Topography:
Waimānalo Valley is about 12 square miles in size, and it is the southernmost valley on the windward or northeast shore of the island of Oʻahu. The valley is bounded on the south by the pali (cliffs) of the Koʻolau Mountains, on the west by Aniani Nui Ridge and Keolu Hills which separate it from Maunawili Valley and Kailua; and on the east by Waimānalo Bay.

The topography varies considerably as the terrain rises inland from the shoreline to the Koʻolau Mountain Range. The valley floor consists of a flat coastal plain that transitions into gentle rising lands with less than 12 percent slope in the inland regions. At the foot of the Koʻolau mountains, the slope ranges from 12 to 20 percent and contains about five percent of the land. Slopes vary from 20 percent to vertical in the remaining upper watershed. The highest point is Puʻu o Kona peak with an elevation of 2,200 feet. (DHHL, 2012).

The Project Area's topography is relatively flat and level terrain. Site elevations range from 15.5 feet above sea elevation at the rear of the site (makai) to 29.0 feet elevation at the front of the site (mauka). The built environment within the center of the Property, the location of the Project Area, has an elevation ranging from 18.8 to 24 feet above sea elevation (ControlPoint Surveying, Inc., 2022).

Soils:
There are 12 soil types of varying properties in the Waimānalo area (DHHL, 2012). According to the USDA Soil Conservation Service, "Soil Survey of the Islands of Kauai, Oʻahu, Maui, Molokai, and Lanai, State of Hawaiʻi", the Property is comprised of (3) types of soil: Haleiwa silty clay (HeB) with 2 to 6% slope throughout the majority of the Property; Waialua clay (WnB) with 2 to 6% slopes along the front sides of the Property, and Mamala cobbly silty clay loam (MnC) at the very back of the Property (see Figure 10: Soils Map). The Project Area is predominantly within the Haleiwa silty clay type (HeB) with a small portion located within Waialua clay soils. The Haleiwa series, "consists of well-drained soils on fans and in drainage ways along the coastal plains. These soils developed in alluvium derived from basic igneous material". The generalized soil profile consists of dark-brown silty clay to 17 inches, and dark brown and dark yellowish-brown silty clay to more than 5 feet (Shinsato, 2023).

4.2.1. Anticipated Impacts and Proposed Mitigation

No adverse effects on the underlying geology and soils are anticipated from the proposed Project. Engineering designs will be based on the findings from the technical studies to ensure the proper structural design of the proposed Project.

The proposed Project is expected to generally retain the overall topographic profile of affected areas utilizing post and pier foundation construction. The final grading design for the Project will be based on investigations and recommendations by licensed engineers. Grading and grubbing will be accomplished to the extent necessary within the limits of the affected construction area. Disturbed areas will be finished or landscaped.

All grading and construction work shall comply with Rules Relating to Water Quality, Department of

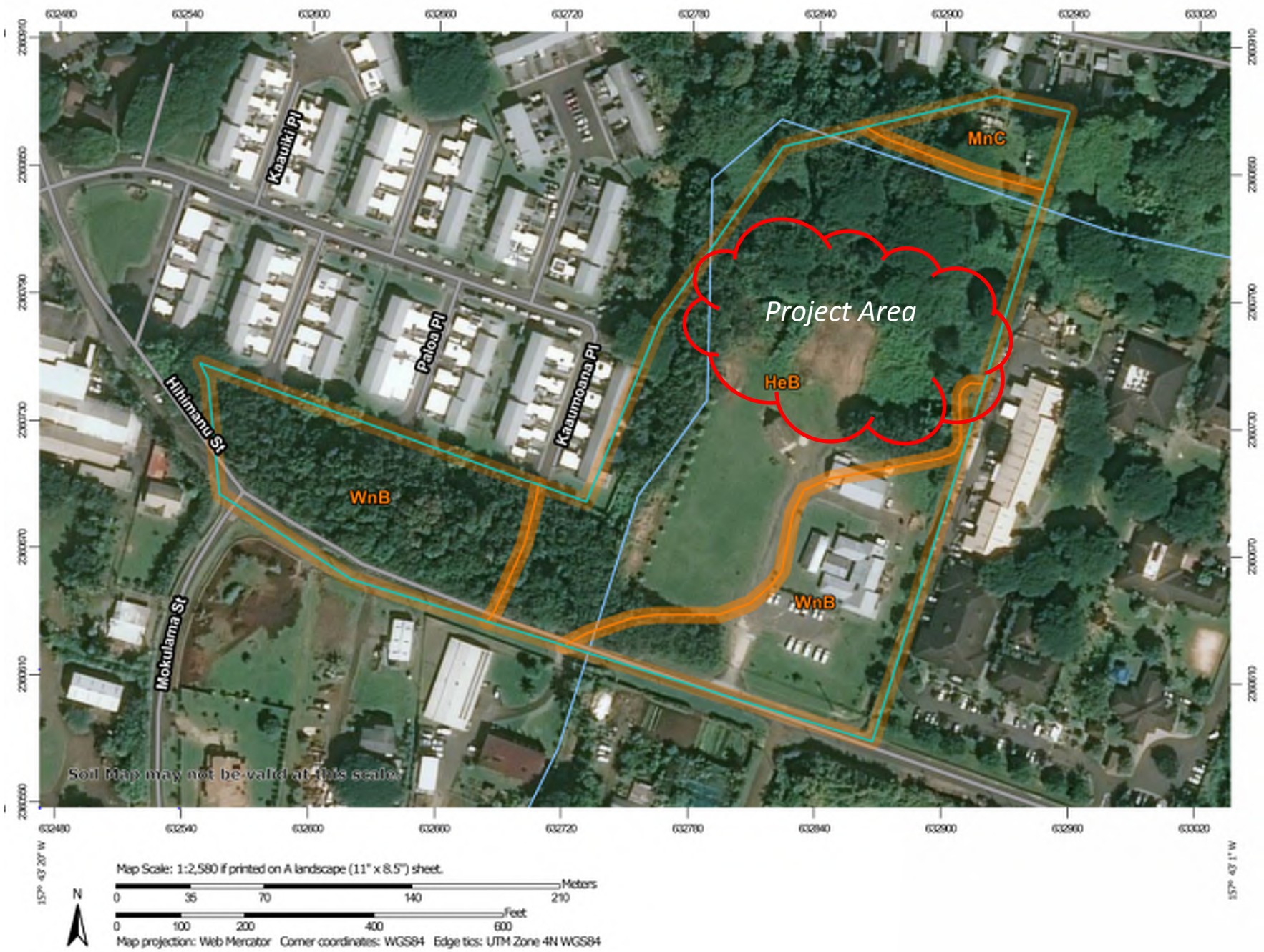


Figure 10: Soils Map

Source: USDA, NRCS

Planning and Permitting, City and County of Honolulu, dated December 2018, to control soil erosion and ensure that the discharge of pollutants from the construction site will be reduced to the maximum extent practicable.

4.3. Natural Hazards (Floods, Earthquakes, and Hurricanes)

Earthquakes

Earthquakes can be caused by the sudden dislocation of the Earth's crust or by a volcanic eruption with the former causing the most destructive earthquakes and are known to cause seismic waves, which travel outward from the source of the earthquake at varying speeds. Moderate earthquakes occasionally occur in the islands; however, most cause little or no damage. The majority of earthquakes in Hawai'i occur on and around the Island of Hawai'i, especially in the southern districts of the island where the most active volcanoes in the State – Kilauea, Mauna Loa, and Lo'ihi – are located (HCCDA, 2020).

Recent earthquakes that had statewide impacts occurred on October 15, 2006. The earthquakes, which occurred off the Kona coast of Hawai'i, had magnitudes of 6.7 and 6.0. The event caused Property damage and triggered an island-wide electrical blackout on O'ahu.

Floods

According to the Flood Insurance Rate Map, City and County of Honolulu, Hawaii, Community Panel Number 15003C0380H, Federal Emergency Management Agency, Federal Insurance Administration, November 5, 2014, the proposed Project is located in Zone AE. This is an area determined to be within the 1% annual chance of flood (100-year), also known as the base flood, which is the flood that has a 1% chance of being equated or exceeded in any given year. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance of flood (See Figures 11a and 11b: Flood Hazard Overview and Assessment Report).

Tsunami:

According to the City and County of Honolulu, Department of Emergency Management (DEM), tsunamis are a series of hazardous, large, long ocean waves caused by earthquakes or volcanic eruptions under the sea.

According to DEM,

> *"…tsunami alerts are issued in Hawai'i by the Pacific Tsunami Warning Center (PTWC). There are four levels of tsunami alerts: warning, advisory, watch, and information statement. Each alert type is tied to a specific action for you to take. When an alert is issued, stay tuned to local radio/TV stations and official social media for more detailed or specific information…In the event of a tsunami warning, the most important thing is to get out of the evacuation zone as soon as possible. Anywhere outside the evacuation zone is a safe place. If possible, make plans to evacuate to a family member or friend's home who lives outside the evacuation zone. During a Tsunami Warning, car traffic may be heavy and can cause delays, so plan to walk to a safe location if possible. If you are near high-rise buildings when an evacuation order is issued, consider vertical evacuation. To vertically evacuate, proceed to the fourth floor or higher of a building that is 10 stories or taller." (DEM, 2023).*

The proposed Project is located on the fringe or border of the tsunami evacuation area with the rear of the Property located within the tsunami evacuation area and the front of the Property located out of the

tsunami evacuation zone (see Figure 12: Tsunami Evacuation Area). Referring to Figure 12, for most tsunami warnings, the public should evacuate out of the red zone. In an extreme tsunami warning, the public should evacuate out of the red and yellow zones. The Tsunami Safe Zone is located towards the front of the Property and continues mauka and to the west or Kailua side of Hihimanu Street.

Hurricanes, Tropical Storms, and High Winds:
The Hawaiian Islands are exposed annually to severe storms generated by passing low-pressure systems and tropical cyclonic storms (hurricanes). Hurricanes are caused by intense low-pressure vortices that are usually spawned in the eastern tropical Pacific Ocean and travel westward. O'ahu, like the other Hawaiian Islands, is vulnerable to hurricanes and tropical storms, which can cause significant damage to Property, infrastructure, and natural resources, and pose a risk to public safety. Many tropical cyclones have passed close enough to affect the Hawaiian Islands since the recording of such events began in the 1950s. Hurricane Iwa in 1982 and Hurricane Iniki in 1992 both brought destructive winds and torrential rains that resulted in significant Property damage.

Pope Elementary School (41-133 Huli St.) located 2.5 miles from the Project Site is an emergency shelter and the only designated hurricane shelter, whereas Waimānalo Elementary located less than a mile from the Project is only a designated emergency shelter. The hurricane shelter can accommodate persons with special health needs and caged household pets. Emergency shelters in the event of a potential disaster will be opened selectively depending on the severity of the situation as determined by DEM.

4.3.1. Anticipated Impacts and Proposed Mitigation

The impact of the proposed Project on the occurrence of natural hazards and its potential effects is expected to be similar to that of other locations on O'ahu. The activities planned for the Project Area are not anticipated to contribute to or exacerbate the occurrence of natural hazards. The proposed Project grading will occur outside of the designated floodway area and structures will be installed above the BFE to mitigate potential risks.

To ensure the safety of students, staff, and guests, HMK and MHPCS are expected to have an evacuation plan in place. A growing component of healthy communities is resilience. Thus, the implementation of an evacuation plan, including the identification of evacuation routes, assembly points, communication protocols, and coordination with emergency services, will be important for the safety and well-being of the school community.

Consideration of building codes and regulations, as well as collaboration with local authorities, emergency management agencies, and neighboring institutions, can help address safety concerns and enhance preparedness efforts.

4.4. Water Resources (Ground and Surface Water)

Groundwater:
DLNR, Commission on Water Resource Management (CWRM) is the primary steward of the State's water resources. CWRM has broad powers and responsibilities to protect and manage Hawai'i's water resources and administers the State Water Code (HRS §174C, 2008 amendment) and administrative rules. Groundwater units have been identified by CWRM as a means to manage groundwater resources.

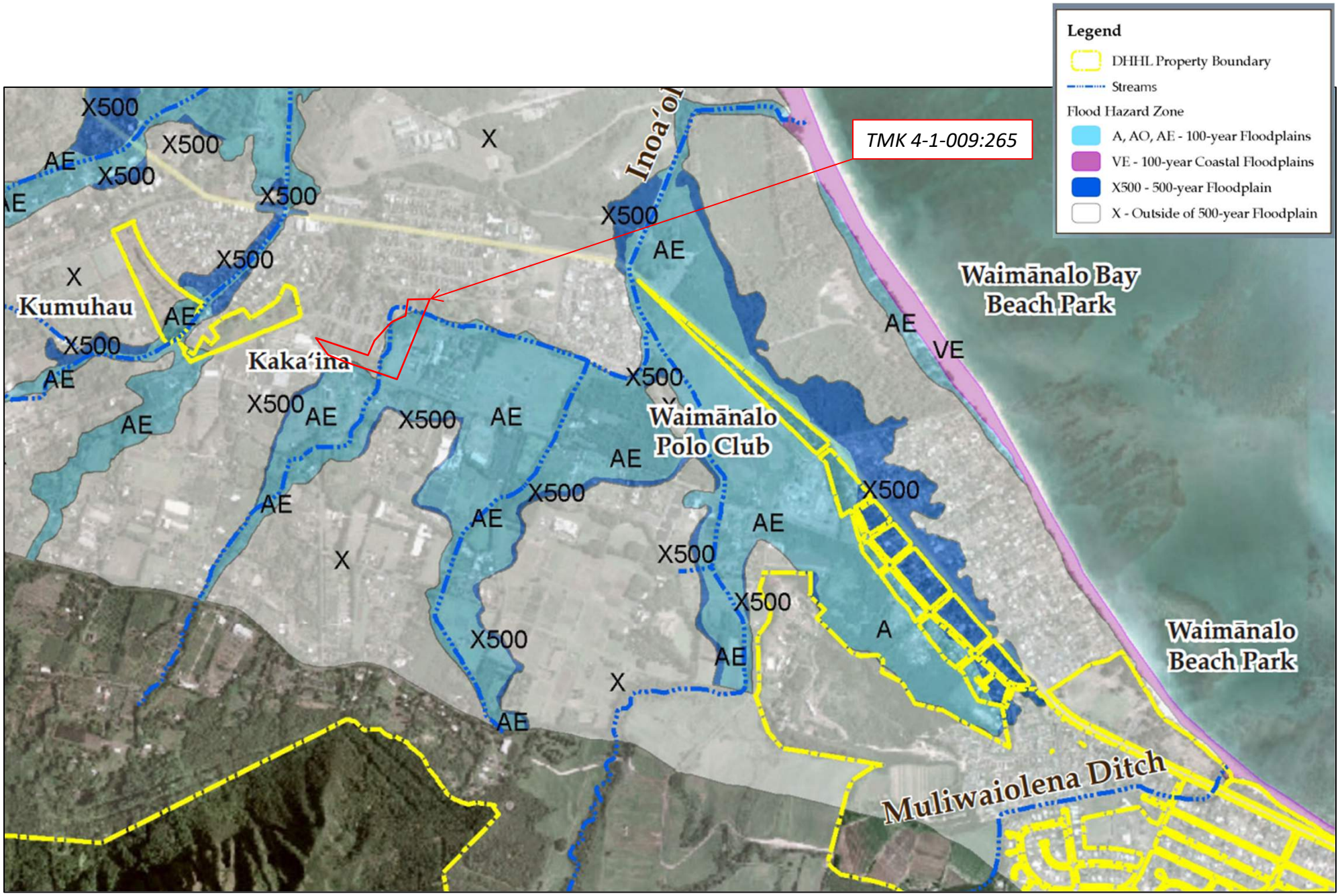


Figure 11a: Flood Map Overview

Source: DHHL. "Waimanalo Regional Plan". November 2011

Figure 11b: Flood Hazard Assessment Report

Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HONOLULU
TMK NO:	(1) 4-1-009:265
WATERSHED:	KAHAWAI; WAIMANALO
PARCEL ADDRESS:	41-477 HIHIMANU ST WAIMANALO, HI 96795

Notes:

Flood Hazard Information

FIRM INDEX DATE:	NOVEMBER 05, 2014
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL:	15003C0380H
PANEL EFFECTIVE DATE:	NOVEMBER 05, 2014

THIS PROPERTY IS WITHIN A TSUNAMI EVACUTION ZONE: NO
FOR MORE INFO, VISIT: http://www.scd.hawaii.gov/

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
FOR MORE INFO, VISIT: http://dlnreng.hawaii.gov/dam/

0 200 400 ft

Disclaimer: The Hawaii Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use, accuracy, completeness, and timeliness of any information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR, its officers, and employees from any liability which may arise from its use of its data or information.

If this map has been identified as 'PRELIMINARY', please note that it is being provided for informational purposes and is not to be used for flood insurance rating. Contact your county floodplain manager for flood zone determinations to be used for compliance with local floodplain management regulations.

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND
(Note: legend does not correspond with NFHL)

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also know as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

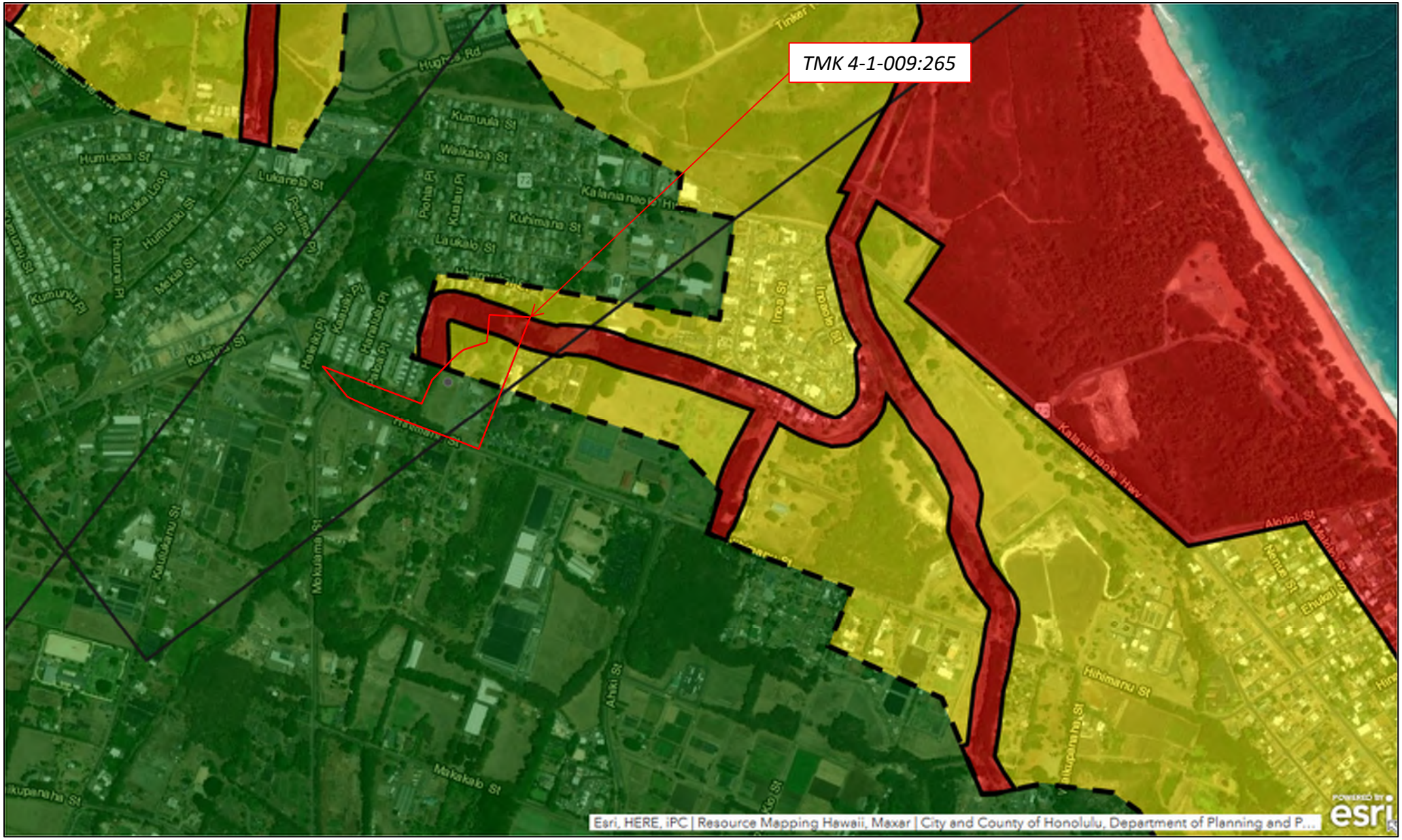
- **Zone A**: No BFE determined.
- **Zone AE**: BFE determined.
- **Zone AH**: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- **Zone AO**: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- **Zone V**: Coastal flood zone with velocity hazard (wave action); no BFE determined.
- **Zone VE**: Coastal flood zone with velocity hazard (wave action); BFE determined.
- **Zone AEF**: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- **Zone XS (X shaded)**: Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- **Zone X**: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- **Zone D**: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase apply, but coverage is available in participating communities.



Source: City & County of Honolulu GIS, 2023

For most **TSUNAMI WARNINGS**, evacuate out of the red zone.

For an **EXTREME TSUNAMI WARNING**, evacuate out of the red AND yellow zones

Figure 12: Tsunami Evacuation Area

Primarily determined by subsurface conditions, each island is divided into regions that reflect hydrogeological similarities within hydrographic, topographic, and historical boundaries. Sustainable yield estimates of aquifers have been developed by CWRM and are revised periodically based on recharge studies, groundwater models, other hydrogeologic studies, pumpage and deep monitor well data, and the identification of errors in previous models or studies (CWRM, 2019). The sustainable yield, "...means the maximum rate at which water may be withdrawn from a water source without impairing the utility or quality of the water source as determined by the commission" (HRS §174C-3).

The proposed Project lies within the Koʻolau Poko Watershed, which is 3,789 acres and characterized as medium size, steep in the upper watershed with little embayment (Watershed Management Plan, 2-5).

The Waimānalo community receives potable water from the Windward Water System, which spans approximately 26 miles from Hau'ula to Makapu'u. The Waimānalo Water System, one of several interconnected with the larger Windward Water System, supplies water to the community through two wells, four tunnels, three reservoirs, and one booster station (DHHL, 2012).

The Waimānalo Aquifer System Area (AYSA), is part of the Windward Aquifer Sector Area. The Waimānalo AYSA sustainable yield estimate is 10 million gallons per day (MGD) (CWRM, 2018). BWS has issued Water Use Permits for groundwater withdrawals totaling 1.843 MGD from the Waimānalo ASYA, which is well below the 9 MGD sustainable yield for this aquifer system (Townscape, Inc., 2019).

Surface Waters:
Within Waimānalo, three streams feed Waimānalo Bay. Puha, the old name for Waimānalo Stream. Waimānalo Stream is located further mauka of the Project Area, moving parallel to Hihimanu Street and the Highway. Inoaʻole Stream (Unnamed Stream) is the second "stream" that flows intermittently, located nearly a mile east and southeast of the Project Site. It is not a natural stream, but rather a drainage that was constructed as a result of sugarcane cultivation in the area. The third intermittent stream, presently called "the ditch," runs through Hawaiian Homelands and is traditionally known as Muliwaiolena. (DHHL, 2012)

The proposed Project is surrounded by Kahawai Stream, an intermittent stream. It is located adjacent to and along the west and northwest perimeter of the Property and continues east. There are no other streams, rivers, ponds, or wetlands (or marshes, swamps, bogs, etc.) located within or immediately adjacent to Project Site (see Figure 13: Intermittent Stream).

Special Management Area:
The Project Area is not located within the Special Management Area (SMA). The SMA boundary is located makai of Kalanianaʻole Highway (see Figure 14, Special Management Area Map).

Stormwater Drainage:
The proposed Project will remove the existing overgrowth of invasive vegetation within the limits and vicinity of the Project Area. MHPCS and HMK will continue to control the growth of invasive species by landscaping and planting native species, edible non-invasive plants, and canoe plants common throughout Hawaii and the Pacific within the Property. By removing invasive plants that disrupt the capacity of native ecosystems to collect water, immediate and surrounding ecosystems should drastically improve including natural drainage capabilities (MISC, 2020).

Source: City & County of Honolulu GIS

Figure 13: Intermittent Stream Map

Source: *City & County of Honolulu GIS, 2023*

Special Management Areas

Outside SMA

Within SMA

1:72,224

0 0.5 1 2 mi

0 0.75 1.5 3 km

Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, USDA

City & County of Honolulu

Figure 14: Special Management Area (SMA) Map

In addition to utilizing rain cisterns to collect and store rainwater for reuse, the proposed Project will maximize pervious and landscaped areas to maximize groundwater recharge, or the movement of water through the soil. Stormwater drainage including bioswales will be designed to retain runoff within the designed open space located between and around each classroom pod and building. The drainage areas will convey water to areas where minimal impacts will occur.

4.4.1. Anticipated Impacts and Proposed Mitigation

The proposed Project is not anticipated to result in any impact on water resources.

Temporary erosion control measures will be installed before any demolition and/or construction activities. BMPs shall include filter socks to prevent any adverse discharges. PCBMPs shall include the implementation of source control BMPs and treatment control BMPs to the maximum extent practicable.

The proposed Project design includes smaller footprint buildings, allowing for open space to be preserved. This design approach maximizes the opportunities for groundwater recharge and rainwater catchment, further enhancing the potential for groundwater replenishment. By prioritizing these features, the Project aims to contribute to the sustainability of water resources and support the overall groundwater recharge potential in the area.

4.5. Biological Resources

The Project Area is located within a larger geographic area that has experienced a long history of land-disturbing activities including sugar cane cultivation and residential development that has altered the natural environment.

The revitalization of an area long-overgrown by non-native and invasive plants with a village-style layout of classroom pods will support ʻāina -based education programs focused on actively learning how to care for the natural environment. The proposed Project facilitates this by working within a 3-acre area, leaving the majority of the Property as open space, then providing both enclosed and covered learning environments, and amenities that further facilitate learning opportunities. Through the HMK and MHPCS programs, students and participants learn how to cultivate and utilize native, non-invasive edible, and canoe plants that are common throughout Hawaii and the Pacific. By incorporating the natural environment into regular programs and activities, HMK and MHPCS choose to work with and learn from biological resources in a way that contributes to the rehabilitation and creation of a more diverse and healthier local ecosystem.

<u>Flora</u>:
No rare, threatened, or endangered species of flora are observed in the Project Area.

Outside the Project Area, but within the Property, the entrance or front area of the Property is predominantly maintained grass lawn and a grove of coconut and `ulu (breadfruit) trees.

In contrast, the rear of the Property or location of the Project Area is overgrown with invasive

vegetation (see Figure 5, Existing Site Photos). Grasses, weeds, and overgrown flora such as guinea grass (Urochloa maxima), california grass (Brachiaria muticada), fiddlewood (Citharexylum caudatum), koa haole (leucaena), octopus trees (Schefflera actinophylla), and gunpowder trees (Trema orientalis), some of which some are considered Hawai'i's most invasive plants (Daehler & Denslow, 2023), cover the Project Area.

Of the plants commonly found in the Project Area, the fiddlewood and the octopus trees are capable of growing up to 50 feet tall, spreading easily through forests and vacant land (BIISC, 2023). Known as a weed and host of pathogens, the fast-growing gunpowder tree is capable of growing even higher, up to 100 feet (BIISC, 2023). The fiddlewood is a prolific seeder, easily spreading to create dense canopies shading out and smothering other plants (BIISC, 2023). The koa haole is often abundant as a weed in dry lowlands, forming dense thickets. Koa haole contains "a poisonous alkaloid called mimosine, which can cause the loss of long hair in humans, horses, and some other animals, and sickness in herbivorous mammals. Mimosine is easily leached from leaves." (Little and Skolmen, 1989). These plants will be removed during site work, and replaced with native plants and food-bearing plants commonly found in the Pacific. This includes hala, `ulu, mango, banana, papaya, and noni; small canopy trees for lei such as plumeria, puakenikeni; and other hedge and groundcover such as pohinahina and beach naupaka.

Within the Project Area, the land is overgrown with two (2) invasive grasses, California and guinea grass. "Invasive grasses are particularly problematic in many tropical ecosystems, where they possess traits that promote their persistence and can drastically alter native plant communities…In Hawai'i, invasive grasses are numerous and highly competitive for light, water, and nutrients" (UH-Manoa, 2023 & Ammond & Litton 2012). The invasive California grass (Brachiaria muticada) is sprawling with rooting runners up to 18 feet long and is typically cultivated to feed livestock. California grass "forms monotypic stands in forest openings and marshes, displacing native plants and destroying bird habitats" (UH-CTAHR, 2003). The invasive guinea grass (Urochloa maxima) "forms dense stands that outcompete native plants and has very high fine fuel loads that greatly increase fire potential, spread, and severity" (Litton, 2008). These plants will be removed during site work, and replaced with zoysia "el toro" stolon.

Once construction of the proposed Project is complete, MHPCS and HMK, as part of its established mission and program, will continue to foster gardening and agricultural education grounded in cultural knowledge. The aim is to continue to build on educational experiences to learn and practice soil health, propagation to harvest and food health, safety, and preparation thereby creating the potential to continue to build on Hawai'i's pipeline of agricultural professionals and advocates. Thus, the proposed action will have a positive impact on biological resources.

Fauna:
Terrestrial fauna in the vicinity of the Project Area consists of introduced species common to lowland areas of O'ahu. Typical bird species found in the area include common myna (Acridotheres tristis), red-crested cardinal (Paroaria coronata), and house sparrow (Passer domesticus). Feral chickens and rodents are found on site as well. The site does not serve as an endangered wildlife habitat; no native birds have been observed.

No species listed by the U.S. Fish and Wildlife Service or in the Endangered Species Act are expected to be affected by the proposed Project. Related to other projects in Waimānalo, USFWS has noted that the federally endangered Hawaiian coot (Fulica alai), Hawaiian duck (Anas wyvilliana), Hawaiian moorhen

(Gallinula chloropus sandvicensis), Hawaiian stilt (Himantopus mexicanus knudseni), and Hawaiian hoary bat (lasiurus cinereus semotus) have been observed in the Waimānalo area. Additionally, the federally threatened Newell's shearwater (Puffinus auricularis newelli) and the Migratory Bird Treaty Act-protected wedge-tailed shearwater (P. pacificus), are known to fly through Waimānalo (City and County of Honolulu Department of Design and Construction 2012). There are no federally designated or proposed critical habitats or presence of threatened or endangered species in the terrestrial areas of the Project Area, and the Project Area has no surface water sources on site (HHF, 2020). However, once invasive overgrowth is removed and replaced with native plants, canoe plants common throughout Hawaii and the Pacific, and non-invasive edible plants, it is possible endangered fauna may begin to visit the Project Area.

4.5.1. Anticipated Impacts and Proposed Mitigation

The Proposed Action is located on previously disturbed land, dominated by introduced invasive species, and surrounded by residential development.

There are no critical habitats on or adjacent to the Project Area that could be impacted by the proposed activities. There will be no nighttime construction or use of lighting which could have an adverse effect on overflying migratory sea birds.

The proposed improvements will remove overgrown vegetation consisting of introduced, invasive species. Removal of overgrowth will also reduce fire risk, reduce the potential for feral or domesticated predators, minimize the spread of invasive plant seeds, and improve natural drainage capabilities, thereby, creating a more accessible physical space to support a healthier diversity of native and non-invasive flora and fauna species.

4.6. Cultural Resources

The following excerpt is from Honua Consulting (2022) unless otherwise noted. Honua Consulting utilizes place name translations/interpretations from Pukui et al. (1974).

The island of Oʻahu was divided in traditional times into moku (regional land divisions) that were further divided into ahupuaʻa (land divisions) and ʻili (subdivisions of an ahupuaʻa). The size and configuration of Waimānalo ahupuaʻa have changed from its traditional Hawaiian (or Oʻahuan) boundaries—which once included Maunalua Ahupuaʻa as an ʻili of Waimānalo (and, therefore, part of the moku of Koʻolaupoko)—to its current extent. The current boundary of Waimānalo Ahupuaʻa follows the ridgeline of the Koʻolau Range to Makapuʻu (literally, "hill beginning" [with "maka" taking on the meaning of "source" or "origins"] or "bulging eye" [from a reference in the famous saga of Pele and Hiʻiakaikapoliopele]). This current configuration—following the Koʻolau ridgeline—is more consistent with the physiographic characteristics of southeastern Oʻahu. In a real sense, Waimānalo's current configuration marks the start (or end) of the windward coast. (LCG, 2020)

Waimānalo (literally, "potable water") is named after its single permanent stream and is associated with several Hawaiian accounts of pūnāwai (fresh-water springs), fishing villages, and small settlements along the coast. Other associations with Waimānalo include a famous kahuna lapaʻau (traditional healer), Kapoi, and the saga of the Hawaiian volcano goddess Pele and one of her sisters, Hiʻiaka. The Waimānalo coastline has a fishpond-like structure, Pāhonu, which is named for honu (green sea turtles). The natural

beauty of the Waimānalo landscape includes stunning physiography such as the two-thousand-foot pali of the Koʻolau ridgeline and the white sands of Waimānalo Bay. (LCG, 2020)

Available records suggest that the traditional Hawaiian population of Waimānalo engaged in wetland taro and sweet potato cultivation was clustered along Waimānalo Stream and its upper tributaries, and the population distribution within the central and southeastern coastal areas was utilizing marine resources. The Koʻolau Poko Watershed Management Plan (Townscape, Inc., 2012) examined the watershed planning district on windward Oʻahu from Kualoa in the north to Makapuʻu Point in the south.

The earliest Hawaiians who settled on the windward coast of Oʻahu developed a food production system that utilized naturally occurring freshwater resources in the Koʻolau Poko area to sustain farming. The abundance of food from farming and the management of productive marine resources contributed to the region's importance as one of the major population centers where several aliʻi (Chief, chiefess, officer, ruler) (including Olopana, Kahekili, and Kamehameha the Great) resided during the pre-contact era of Hawaiʻi. Widespread epidemics and outbreaks that affected all of Hawaiʻi caused severe population declines in Koʻolau Poko during the 1800s (LCG, 2020). It is estimated that the population decreased by over 90 percent from 20,000 to 25,000 inhabitants in the late 18th century to slightly over 2,000 inhabitants in 1872.

The concepts of private land ownership led to vast changes in settlement patterns in Hawaiʻi starting from the late 1840s. Large tracts of land in the Koʻolau Poko area were sold or leased for mono-crop agricultural ventures (e.g., sugar, rice, and pineapple) and livestock ranching activities. The population of Koʻolau Poko began to grow again as immigrant laborers settled in the district. Waimānalo Sugar Plantation was one of nine sugar plantations in Koʻolau Poko. It operated for 70 years from 1878 to 1947 and encompassed roughly 3,000 acres of land extending six miles along the Waimānalo coast and four miles inland to the base of the Koʻolau Mountain Range. The plantation was founded in 1877 by John A. Cummins. In 1885, the plantation passed to W.G. Irwin who was instrumental in the construction of the ditch irrigation system that diverted water from streams and springs to plantation lands. As the plantation expanded, former ranch land was converted to cane fields, irrigation ditches, and railroad lines were constructed, and other infrastructure was improved. The destructive effects of cattle and ranching activities on vegetation and forested areas in Koʻolau Poko eventually led to the establishment of forest reserve areas by the Territorial Government of Hawaiʻi. Waimānalo Forest Reserve includes 7,395 acres in the mauka (or landward) portions of Waimānalo, Kailua, and southern Kāneʻohe.

Residential population growth in Waimānalo followed the construction of the Kailua-to-Waimānalo Road in 1924. The first Hawaiian Homes development in Waimānalo began in 1925 and was followed by the Waimānalo beach lot homes in 1926. Waimānalo has mostly retained its rural character as compared to other urbanized areas of Koʻolau Poko, which experienced tremendous housing and population growth from the 1950s through the 1980s. Development in Waimānalo has occurred at a slower pace in part because much of the Waimānalo Sugar Plantation lands were passed to the Territorial and then the State government.

4.6.1. Anticipated Impacts and Proposed Mitigation

The Project Area is part of the State of Hawaii's land acquisition from the Waimānalo Sugar Plantation. Based on available maps and historic accounts, the land designed for the proposed Project has since

remained vacant, and overgrown with invasive plants. Before the 1997 development of The Waimānalo Teen Project (now known as HMK), the existing built area towards the front of the Property was identified as cornfields and banana patches, and the Project Area was void of agricultural use, noting only wire fencing and related metal corral and metal gates indicating that the Project Area was likely used for domestic or wild caught ungulates (Chu, 1997, Sheet L-1).

Based on available information, there are no documented instances of historical cultural practices taking place within the Project Area. However, it is important to note that the applicants, HMK and MHPCS, actively incorporate cultural practices and protocols. As a result, the proposed Project not only supports but also enhances and protects cultural resources within the Project Area. Through these cultural practices and protocols, the Project contributes to the preservation and celebration of Hawai'i's cultural heritage.

The proposed Project will support and encourage access to the site for cultural practices, aligning with the organizations' goals of protecting, perpetuating, and teaching cultural traditions. It seeks to actively engage youth, families, and the community in experiencing, learning, and practicing cultural practices that have been absent in the Project Area.

By fostering the integration and alignment of HMK and MHPCS, the collaboration serves as a valuable community asset. It aims to bridge connections within the community and strengthen both organizations for the future. The collaborative efforts foster a contemporary perspective that recognizes the importance of cultural practices and their role in community engagement and well-being.

4.7. Archaeological and Historical Resources

Pre-Contact:
Waimānalo ahupuaʻa, named for its largest stream, covers just over 11 square miles. The ahupuaʻa was once rich with Hawaiian sites, but many have vanished or been destroyed over time. Located just south of Kaiona Beach Park, there are remnants of Pāhonu Pond, an ancient Hawaiian stone enclosure where fishermen put turtles that were to be consumed by the aliʻi. Stories tell of former small fishing villages along the shore. The pu'uhonua of Haununāniho (binding the teeth), a sacred site where anyone was forgiven, formerly rested on a small hill makai of the present highway. Various sources have recorded at least four heiau in Waimānalo and numerous sacred pohaku. One such stone is Pōhaku Pa'akikī, sacred to local sweet potato farmers who offered 'awa daily to Kamohoali'i, their shark god. Kaupō Beach Park was the site of the ancient fishing village of Ko'onāpou which was abandoned in 1853, due to the smallpox epidemic. Some of the earliest habitation sites in the State of Hawai'i are located in the Bellows dune fields. Twelve major archeological sites, including religious temples (heiau), have been identified in the watershed.

In pre-contact and pre-sugar days Koʻolau Poko supported a large system of loʻi kalo (wetland irrigated field for taro where water passes through and corms are submerged) with a wide variety of traditional Hawaiian crops clustered around stream areas. The earliest Hawaiians who settled on the windward coast of Oʻahu developed a food production system that utilized naturally occurring freshwater resources. Thus, additional upland loʻi kalo, fed by small streams and springs, existed along the base of the Ko'olau range. These loʻi kalo were served by a system of 'auwai (irrigation ditches used to transport water from one place to another). The area's agricultural tradition has a long and rich history where an abundance of food contributed to the region's importance as one of the major population centers

where several aliʻi (including Olopana, Kahekili, and Kamehameha the Great) resided during the pre-contact era of Hawaiʻi.

During the 1800s, widespread epidemics and outbreaks that affected all of Hawaiʻi caused severe population declines in Koʻolau Poko during the 1800s. It is estimated that the population decreased by over 90 percent from between 20,000 to 25,000 inhabitants in the late 18th century to slightly over 2,000 inhabitants in 1872.

Late 1800s to Mid-1900s

Ranching in Waimānalo*:*
In 1828, Englishman Thomas Cummins arrived in Hawaiʻi, and soon after married into the Kamehameha family, providing connections to the throne that resulted in a lease of nearly 7,000 acres of land in Waimānalo. Thomas Cummins and his son, John A. Cummins then proceeded to build a large cattle and horse ranch in Waimānalo. A landing was constructed at Waimānalo Bay, as access to Waimānalo before the construction of Nuʻuanu Pali road was primarily by sea. A railroad line was also constructed to connect the landing to the Cummins Estate. In general, the introduction of livestock to Hawaiʻi hurt the natural environment and contributed to the demise of transitional Hawaiian life. Without walls and fences to contain the vast herds of cattle, sheep, and horses, the animals trampled the small scattered homesteads that relied on kalo (taro, or *Colocasia esculenta*) farming, fishing, gardening, and all the associated activities, and stripped the land of native vegetation. The lo'i were destroyed to support ranching activities and these changes destroyed the traditional plantings as well as larger trees, resulting in the loss of vegetation throughout the whole area.

During the Great Mahele of King Kamehameha III from 1846 to 1848, the approximately 7,000-acre Waimānalo Ahupua'a was reserved as “Crown Lands.” It was during this time that native Hawaiians were awarded fee simple patents for their home sites and cultivated lands. However, starting in 1840, large portions of Waimānalo were used for ranching sheep and cattle (See Figure 15: Hawaii Territorial Survey, 1916).

The Waimānalo Sugar Company (1878-1947):
In 1876, the Hawaiian Kingdom entered a Reciprocity Treaty with the United States, which provided the burgeoning Hawaiian sugar industry with a free market, and the potential for great profits. John A. Cummins, recognizing the potential for sugar production in Waimānalo, established the Waimānalo Sugar Company and in 1880 began constructing the sugar mill near Poalima Street behind present-day Shima’s Market on Kalaniana‘ole Street, a mere 0.5 miles from the Project Site. (LCG, 2020)

Large tracts of land in the Koʻolau Poko area were sold or leased for mono-crop agricultural ventures (e.g., sugar, rice, and pineapple) and livestock and ranching activities. The population of Koʻolau Poko began to grow as immigrant laborers settled in the district. Waimānalo Sugar Company was one of nine sugar plantations in Koʻolau Poko, operating for 70 years from 1878 to 1947 and encompassed roughly 3,000 acres of land extending six miles along the Waimānalo coast and four miles inland to the base of the Koʻolau Mountain Range. In 1885, the plantation passed to W.G. Irwin who was instrumental in the construction of the agricultural ditch irrigation system that diverted water from streams and springs to plantation lands. The destructive effects of cattle and ranching activities on vegetation and forested areas in Koʻolau Poko eventually led to the establishment of forest reserve areas by the Territorial

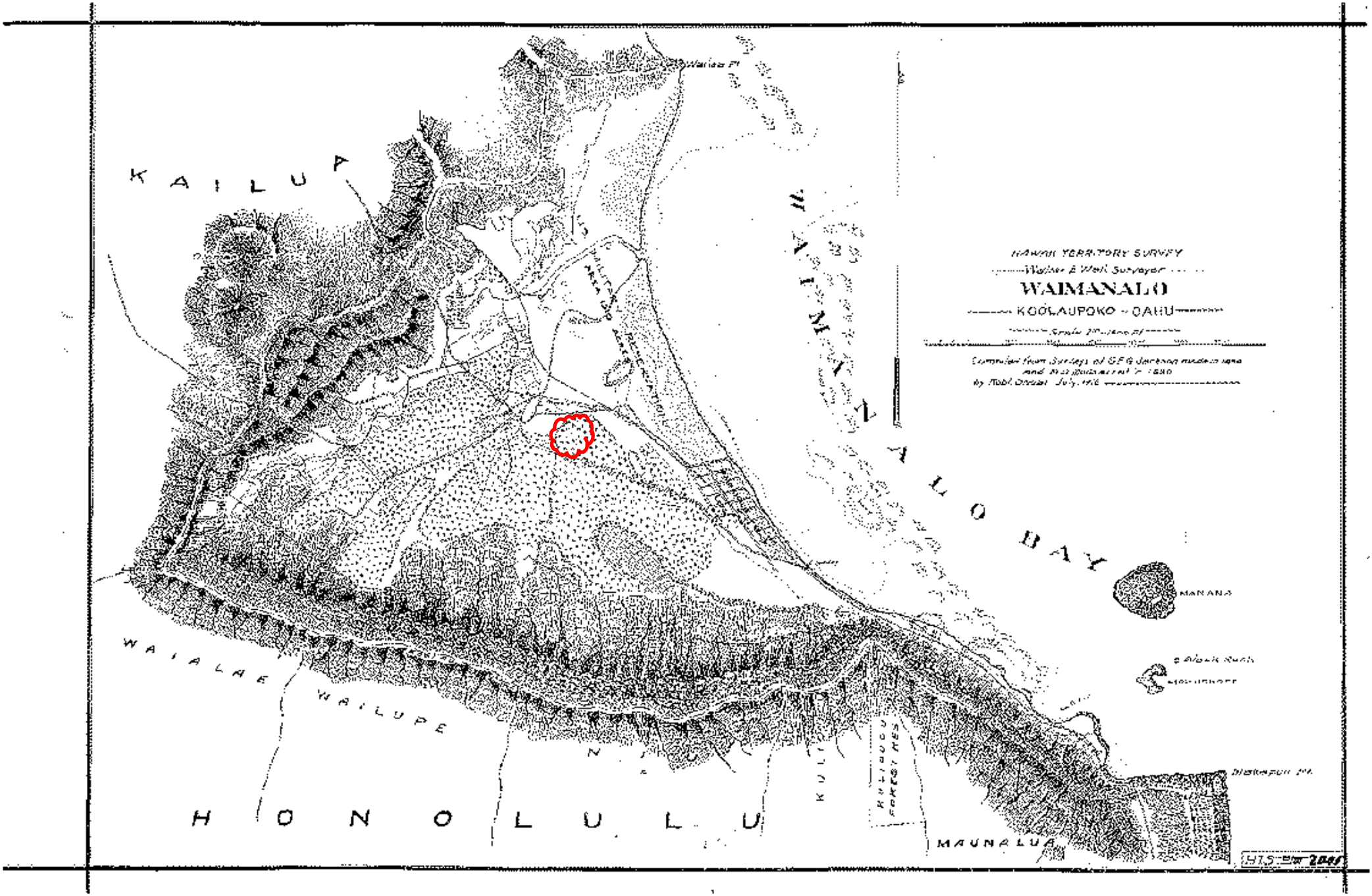


Figure 15: Hawaii Territorial Survey, 1916

Source: Waimanalo Bay Beach Park Master Plan

Government of Hawai‘i. The Sugar Company was liquidated in 1947. Leased land was sublet to local farmers, and fee-simple lands were sold.

The introduction and practice of private land ownership led to vast changes in settlement patterns and wealth in Hawai‘i. Hawaiians, particularly commoners, were unaccustomed to the concept of fee simple ownership of land. This unfamiliarity with a new concept of land ownership, coupled with numerous legal and logistical constraints, led to the foreign acquisition of large amounts of land (Maui County, 2008). Residential population growth in Waimānalo followed the construction of the Kailua to Waimānalo Road in 1924.

Modern Times:

The primarily residential area in Waimānalo during the early 1900s was in the vicinity of the Waimānalo Sugar Company mill (the vicinity of the Project Area) and consisted mainly of housing for plantation workers and their families. Further residential development was hampered by the lack of available land since most of Waimānalo was under sugarcane cultivation, and the lack of adequate overland transportation routes to Honolulu, which was O‘ahu’s commercial, civic, and political center.

In December 1918, Waimānalo lands were advertised for purchase at public auction, under the deed of trust made by John Cummins in 1896 (Honolulu Advertiser, 13 December 1918:11). These lands included the residue and unexpired portion of the lease of 6,970 acres in the Waimānalo Ahupua‘a, and the auction was based on the ability to submit (and pay) the highest bid. This facilitated the continued pattern of Hawaiian ali‘i and other affluent O‘ahu citizens building grand oceanfront estates, which continues into the present day. Remote areas became some of the most desirable locations to build oceanfront estates and a semi-building craze began, reaching its peak in the 1920s and 1930s with the construction of several new estates on the north shore and windward and leeward coasts of O‘ahu (Dooley 2011:10) (LCG, 2020).

In 1924, the Nu‘uanu Pali road officially opened, linking both Waimānalo to Honolulu and Kailua. With the improved accessibility and visibility of the area, the first successful significant sale of Waimānalo lands to the public occurred with the establishment of the Waimānalo Beach Lots subdivision in 1925 that included 266 lots on 90 acres of land (Bartholomew and Associates 1959:16). Additional residential development occurred in the coastal portion of central Waimānalo with the establishment of Waimānalo Homestead by the Hawaiian Homes Commission in 1925. However, it wasn’t until the 1930s when the Makapu‘u Pali switchback pass was connected connecting Koko Head to Waimānalo (LCG, 2020).

Hawai‘i or National Registers of Historic Places

According to the National Register of Historic Places, historic significance is defined as “The importance of a Property to the history, architecture, archeology, engineering, or culture of a community, State, or the nation”. Abiding by special regulations becomes imperative once listed under the Hawai‘i or National Registry of Historic Places (under section 106 of the National Historic Preservation Act and/or Chapter 6E of the Hawai‘i Revised Statutes). A total of 7 registered sites have been located in the Community of Waimānalo region (see Table 1). Some of the significant archaeological sites in Ko‘olau Poko include ancient fishponds and known remaining sacred sites such as heiau and fishing shrines many of which are listed on the Hawai‘i or National Registers of Historic Places.

The Project Site is not listed on the State or National Register of Historic Places and is part of the geographic area that has experienced a long history of significant land disturbance from large-scale agriculture.

Table 1: Registered Sites in Waimānalo

Site Number	Site Name	Hawai'i Register	National Register
80-15-382	Pohakunui Heiau	9/05/78	
80-15-489&490	Koa (Rabbit Island)	1/29/81	
80-15-511	Bellows Field Archaeological Area		8/14/73
80-15-516	Waimānalo Taro Terraces	6/17/87	
80-15-1031	Heiau	1/29/81	
80-15-1037	Pāhonu Pond/Heiau	9/2/78	
80-15-4042	Waimānalo Ditch System		9/18/81

Source: Waimānalo Teen Project Site Analysis Report

4.7.1. Anticipated Impacts and Proposed Mitigation

The Project Site is not listed on the Hawai'i Register of Historic Places or listed on the National Register of Historic Places. No existing buildings will be affected by the Project.

The proposed Project Area is located within a developed area that was adjacent to the historic sugar mill. Based on historic land use maps and archaeological survey studies in the area, there are no known archaeological and cultural resources on the Subject Site. In the event any unanticipated sites or remains are encountered, work shall stop and the State Historic Preservation Division will be immediately contacted.

4.8. Agricultural Resources

Waimānalo has the "largest concentration of high-quality agricultural land in Ko'olau Poko, which is also within reasonable reach of the Honolulu market and overseas shipping terminals" (BPSD, 2017). Waimānalo supports approximately 450 acres of active production, the bulk of which is in landscape,

foliage, and flower production. Roughly 200 acres are in diversified crops including the University of Hawaii, College of Tropical Agriculture and Human Resources (UH-CTAHR) Waimānalo Research Station which was established in 1955 to promote diversified agriculture, an educational partner of MHPCS. The Waimānalo Agricultural Park under the Hawai'i State Department of Agriculture is composed of 126 acres subdivided into 14 lots and there are also other state land leases under the Non-Agricultural Park designation that were formerly under the Department of Land and Natural Resources. The Agricultural Park is an area set aside specifically for agricultural activities to encourage the continuation or initiation of such operations. Waimānalo also supports several equestrian activities from horse boarding and training to polo. (HSL, 2018)

The agricultural lands in Waimānalo are unique on O'ahu for two reasons. First, unlike the vast tracts of former cane or pineapple lands in Kunia, the agricultural lots in Waimānalo were broken into smaller parcels. The vast majority of the lots range between 1 and 10 acres, with most being approximately three acres.

Food Security:
Hawai'i is located approximately 2,500 miles from the continental United States. About 85 to 90 percent of Hawai'i's food is imported, which makes Hawai'i particularly vulnerable to natural disasters and global events that disrupt shipping and other modes of transporting food (SB275_SD1, 2023). The MHPCS in collaboration with HMK anticipates increasing the production of locally grown foods and utilizing plant foods to supplement the diet of students and program participants. The hands-on, on-site experience will pique students' interest and provide direct application to further encourage students to seek higher education and work in agriculture sectors, which is an essential part of meeting the strategic objectives of the State of Hawai'i's, "Increased Food Security and Food Self-Sufficiency Strategy".

4.8.1. Anticipated Impacts and Proposed Mitigation

The proposed Project aligns with the recommendations of the Ko'olau Poko Sustainable Communities Plan, which emphasizes that schools can be communal resources for specialized learning about environmental, cultural, and historical topics. Both MHPCS and HMK aim to establish and care for educational sites that provide continuous agricultural and 'āina-based learning opportunities, going beyond singular experiences within traditional school frameworks.

By incorporating food production gardens and cultivating food and lei plants around the buildings and in open space areas, the proposed Project contributes to healthier and more affordable food choices, and opportunities to authentically practice cultural protocols for students, staff, and community members. This collaboration - adding more hands to care for the gardens - enhances sustainable cultivation and food supply activities and lessons.

In accordance with the O'ahu Resilience Strategy, Pillar 1 - Remaining Rooted, Goal 3: Improving Economic Opportunity, Action 10: Promoting new agricultural models for economic and food security, the proposed Project provides physical space and engages students and participants in agricultural and gardening opportunities, technology, and pathways to local food and agricultural entrepreneurship. The ample space and dedication to hands-on backyard farming, local food production, and self-sufficiency support Hawaii's effort to reduce food insecurity, dependence on imported food, and reliance on external factors. Additionally, it contributes to job creation, economic diversification, and a stronger local economy.

The existing backyard farming practice includes the cultivation of coconut, banana, aquaponics, breadfruit, and other canoe plants, serving as a foundation for the proposed Project. It strengthens the collaboration between HMK and MHPCS' viability for extensive on-site backyard farming, providing opportunities for students to become future career farmers, producers, and advocates for locally grown and consumed products. This collective effort enhances resilience, reduces vulnerabilities, and contributes to long-term sustainability and prosperity.

4.9. Socio-Economic Characteristics

Health and Well-Being

The American Planning Association defines healthy communities as places where all individuals have access to healthy built, social, economic, and natural environments that allow them to live to their fullest potential. In Hawai'i, many practitioners are sharing traditional Hawaiian models of health and well-being. These models highlight the importance of relationships; connections to the 'āina, and spiritual and cultural identity.

Recently, health and well-being on a community level are also being framed in terms of resilience. The City and County of Honolulu's Ola O'ahu Resilience Strategy define resilience as "[t]he ability to survive, adapt and thrive regardless of what shocks or stresses come our way." Some definitions bring in indigenous perspectives, for example, a definition from a publication on indigenous resilience in Australia suggests that resilience relies on individuals, communities, and the environment adapting together.

Population and Demographics

Waimānalo has a stable population base. The community has experienced relatively slow growth, in part, due to its rural community boundary. Most of the working residents are employed outside of the community and commute an average of more than 35 minutes to their workplace (DHHL, 2012). Small-scale employment opportunities in the immediate region are generally limited to agricultural-related activities, retail and outdoor recreation.

Today, MHPCS employs 22 individuals, of which 20 (91%) are Native Hawaiian, and 10 of the 22 (45%) staff live in Waimānalo. Of the nine (9) members that serve on the Governing and Foundation Boards, six (6) are Native Hawaiian (67%) and four (4) live in Waimānalo (45%). Staff and Board members are lifelong learners alongside haumāna, expected to live and follow the school mission, promise, values, and *Mind of the Navigator Skills* in their work at MHPCS. Daily, staff and students recite a "student-friendly" version of the mission, "All haumāna and kumu will become caring, compassionate, and loving navigators" that live the values and mission of the school.

Today, HMK employs 17 people, of which 14 (82%) are Native Hawaiian, while nine (9) or 53% of staff live in Waimānalo. Of the six (6) members on the governing board, four (4) are Native Hawaiian and four (4) live in Waimānalo.

General Characteristics	**Waimānalo**	**Honolulu County**
Resident Population (Source: Hawaii State Data Book, 2020)	9,909 (by zip code)	979,682
Population under 5 (Source: US Census, CDP)	4.9%	5.9%
Population under 18 (Source: US Census, CDP)	31.8%	21.0%
Population 65 years or over (Source: US Census, CDP)	13.6%	18.8%
Social Characteristics:		
High School Graduate or Higher (Source: US Census, CDP)	90.8%	92.7%
Bachelor's Degree or Higher (Source: US Census, CDP)	16.3%	36.2%
Economic Characteristics:		
Median Household Income (Source: US Census, CDP)	$111,250	$92,600
Per Capita Income (Source: US Census, CDP)	$31,134	$40,339
Housing Characteristics:		
Households (Source: US Census, CDP)	1,206	330,393
Owner-Occupied Units (Source: US Census, CDP)	72.9%	58.4%
Persons Per Household (Source: US Census, CDP)	4.45	2.96
Others:		
Race (Source: US Census, CDP	44.1% Two or more races 29.2% Native Hawaiian or Pacific Islander, alone 14.5% of Asian, alone 10.6% White, alone 1.6% Other	23.6% Two or more races 10.0% Native Hawaiian or Pacific Islander, alone 42.1% of Asian, alone 21.3% White, alone 3.0% Other

Housing:
The region is characterized by older dwellings; its aging infrastructure, facilities, and dwellings need improvements and upgrades. The community places a high emphasis on natural resource preservation, agricultural and rural retention, and traditional ways of life. As Waimānalo's aging housing stock is replaced, expanded, or remodeled, the area is experiencing growth in the area of multi-generational and "non-traditional" households, as well as larger dwelling sizes on single-family residential lots. (DHHL, 2012)

Within Waimānalo, as of 2014, DHHL awarded 799 Residential Homesteads and 2 Subsistence Agriculture Leases awarded within the Waimānalo and Kumuhau homestead communities with an additional 45 undivided interest leases awarded in anticipation of the Kakaʻina homestead community. The 2010 socioeconomic characteristics of the Waimānalo Homestead include a population of 3,048 people with a median age of 38.9 and 14.5% of the total population 65 years and over. The average household size is 4.56. (DHHL, 2014)

Commercial uses in Waimānalo are clustered in commercial strips along Kalaniana'ole Highway. These strips are primarily located in two areas: Waimānalo Town and the makai side of the beach area between Waimānalo Bay State Recreation Area and Waimānalo Beach Park. Sea Life Park also represents a significant commercial venue. (DHHL, 2012)

Agriculture:
The Waimānalo district is a vibrant area for nursery and orchard operations. Small-scale truck farms growing fresh greens and organic foods have grown in number over the last few decades. The area's relative proximity to markets, in addition to fertile growing lands, is a significant positive attribute for agricultural activities. The UH Agricultural Experiment Station and Oceanic Institute serve as incubators for new crop development, best practice models, and emerging agriculture and aquaculture operations, while equestrian and ranching operations present potential opportunities to capitalize on traditional and rural activities. (DHHL, 2012)

4.9.1. Anticipated Impacts and Proposed Mitigation

The Proposed Action will have an immensely positive social impact on the surrounding area. Both short- and long-term beneficial economic impacts from the construction of the educational facility to the operation of the educational programming will shape tomorrow's leaders.

By focusing on educating caring, compassionate, and loving navigators that live the values and mission of the school together with the American Planning Association's definition of healthy communities. HMK and MHPCS create the foundation and place to build and strengthen connections to others, learn physical and mental resilience, strengthen cultural identity, learn to protect and mālama ʻāina, and encourage community-wide participation starting with families. Uses that support healthy communities include childcare and educational facilities, wellness services, community centers, green spaces, community gardens, aquaponics, and areas for community economic development such as a commercial kitchen and community gardening spaces, all of which the Proposed Action will create.

Continuing to partner with communities, organizations, and individuals; designing a physical program that fosters a welcoming and safe space; incorporating green infrastructure and low-impact development; and, promoting multi-modal transportation will further support health and well-being, as

well as a resilient and sustainable space.

Lastly, by utilizing approximately three (3) acres of unmaintained and unused land, the Proposed Action is removing the potential and historic occurrence of trespassing and illegal activities that may occur in this overground vacant area. By cleaning up and stewarding the natural resource, the Proposed Action will better manage and support the land with activities that align with the State General Plan's policies and objectives for a more resilient and thriving community.

4.10. Visual Resources

Waimānalo is known for its diverse and picturesque natural and cultural landscape. The region encompasses lush forested valleys, rugged ridges extending from the interior valleys to the summit of the Koʻolau Mountains, agricultural fields, and rural communities.

The wide sandy beaches of Waimanalo Bay stretch from Wailea Point to Makapuʻu Point with narrower beaches and emerging reef rock near Pāhonu Pond in the middle section of the bay. The proximity of Kalanianaʻole Highway to the ocean offers both visual and physical access to the shoreline. In the southernmost stretch, at Kaupō Beach Park and Makapuʻu Beach Park, there are unimpeded visual and physical access points. From the highway, one can admire breathtaking views of coastal headlands, cliffs, ocean waters, and offshore islands.

The commercial areas of Waimānalo maintain a building scale and design character that is appropriate for a rural area. These areas exude a "village center" ambiance, where activities such as farmers' markets and feed stores have a visible presence. Additionally, provisions are made for roadside vending, outside of the right-of-way, to facilitate the sale of agricultural products in a manner consistent with traffic safety and the rural atmosphere.

The surrounding mountains in Waimānalo serve as a prominent visual resource, providing a striking backdrop to the region's lush tropical landscape. These natural features contribute to the area's scenic beauty and cultural significance, offering inspiration and enjoyment for all who appreciate them.

4.10.1. Anticipated Impacts and Proposed Mitigation

The proposed Project is expected to have no impact on the visual resources of the Waimānalo area. Currently, the Project is characterized by decades-old overgrown, unmaintained invasive vegetation, which can also attract undesirable, often illegal activities. The proposed Project aims to address this by revitalizing the land and returning it to active educational and backyard farming use, while also creating opportunities for learning and improving the overall aesthetics of the Property.

The proposed Project involves the construction of single-story post-and-pier buildings, with a maximum height of 18.5 feet for the multi-purpose building, ensuring that the visual character of Waimānalo remains largely unchanged. Overall, the Project's design and landscaping efforts are intended to blend harmoniously with the existing visual character of the area, while improving the appearance of the Property and contributing to its overall visual enhancement.

4.11. Hazardous Materials and Solid Waste

The Property site is not in the vicinity of any recognized environmental hazards or other hazardous substances. There are no known threats about hazardous materials at the Project Area. Solid waste generated on Oʻahu goes to disposal facilities including two landfills and a waste-to-energy facility located within the Campbell Industrial Park. The solid waste generated at the Project Area is currently collected by a solid waste collection service for proper disposal.

4.11.1. Anticipated Impacts and Proposed Mitigation

Given the undeveloped state of the Project Area, no specific mitigation measures are anticipated. However, during the construction phases, there may be a temporary increase in solid waste volume, including construction debris, which will need to be transported offsite for proper disposal. The Project team will adhere to regulatory guidance provided by the Department of Health's Solid and Hazardous Waste Branch (SHWB) and ensure that appropriate waste management and disposal practices are implemented by the construction contractor.

In the long term, as the Project Area becomes operational, there is the potential for an increase in solid waste generation due to the number of students and ancillary uses. However, this increase is expected to be managed appropriately with the proper waste disposal contractors without any adverse impacts.

4.12. Infrastructure and Utilities

The Project Area and surrounding areas in Waimānalo are served by electrical, water, sewer, and telecommunication service. Hawaiian Electric Company provides electrical service to Waimānalo. Telephone and cable services are provided by Hawaiian Telcom, Inc. and Spectrum/Charter Communications, respectively. Overhead electrical and telephone lines are located along both sides of Kalaniana‘ole Highway within the highway right-of-way. Cellular telephone and internet connectivity are available through a variety of providers. The Honolulu Board of Water Supply provides municipal water service, and the City and County of Honolulu provide sewer service.

<u>Access</u>
The proposed Project’s driveway and turnaround area is a straight path directly from the existing driveway entrance from Hihimanu Street. This driveway will be accessible to both automobiles and emergency vehicles. The HMK parking area will remain the same, and the new MHPCS parking area will be situated alongside the MHPCS administrative office, providing convenient access for visitors.

All newly constructed structures will comply with the 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design (Department of Justice, September 15, 2010) including access ramps to each structure.

<u>Water System</u>
The Project Area is situated in the Waimānalo Aquifer System Area (ASYA), which forms part of the Windward Aquifer Sector Area. Potable water service is provided to the Project Area through an existing 8-inch water main located on Hihimanu Street and water service to the Project Area is supplied through a 2-inch diameter lateral with a 1.5-inch water meter with a 2-inch water line serving the site. Separate from the domestic potable service, the Project will also provide fire protection by supplying an onsite

fire hydrant and connection to the fire sprinkler system. The availability of water will be confirmed by BWS upon receipt and review of the building permit application.

The current operation of the school across multiple sites in Waimānalo utilizes water resources at each location. However, with the consolidation of these sites through the proposed Project, there will be a slight increase in demand for municipal potable water resources primarily due to the addition of a commercial kitchen facility since food preparation and service will be centralized in the proposed Project Area.

To mitigate the impact and promote environmental sustainability, the Project is committed to incorporating low-flow water fixtures, and water catchment measures such as rain cisterns, and bio-swales. These measures will help reduce water use, capture and store rainwater for various uses, reducing the reliance on potable water sources, while bio-swales increase groundwater recharge.

Electrical Services and Communications

Electrical Services and communication opportunities are readily available through existing connection points on-site and immediately located on Hihimanu Street. Electrical power for the Project Area is provided by HECO. Other communication services are provided by Oceanic Time Warner Cable or Spectrum. The overhead communications lines are located on utility poles along Hihimanu Street.

Wastewater System

The Waimānalo Wastewater Treatment Plant (WWTP) currently serves the windward coast of Oʻahu from Makapuʻu to Waimānalo. The wastewater collection system is owned by the State of Hawaii and operated and maintained by the City and County of Honolulu. The WWTP plays a crucial role in managing and treating wastewater within the area, ensuring the protection of public health and the environment.

In Waimānalo, wastewater is managed through a network of gravity sewers that collect wastewater and transport it to the WWTP. However, Waimānalo includes both sewered and unsewered areas. Unsewered areas consist of low-lying coastal areas and inland agricultural lots, which currently utilize individual wastewater systems such as cesspools or septic tanks with leaching fields. Additionally, a portion of homes in sewered areas are not connected to the sewer system and continue to use individual wastewater systems.

To accommodate the projected population growth and address these concerns, upgrades were completed in May 2008 to the WWTP. These upgrades increased the plant's capacity to 1.1 million gallons per day (mgd) and included improvements such as a new secondary biological treatment process, effluent filtration system, additional injection wells, sludge thickening facilities, upgraded electrical system, personnel, and maintenance facilities. The expansion also introduced an ultraviolet disinfection system and effluent pumping facilities to enable the use of recycled water for irrigation purposes in selected agricultural lots and the Olomana Golf Links.

The Property is connected to an existing sewer system service that runs directly along the eastern side of the Property to Hihimanu Street. Thus, the proposed Project will be served by the existing private and municipal sewer systems. A new pressure sewer connection will connect to the privately owned 4-inch diameter pressure sewer main and continue to connect to the municipal system approximately 1,500 linear feet from the Property. All wastewater and sewer construction will be performed in accordance

with the current City and County of Honolulu rules.

Drainage System
Storm Impacts: While Waimānalo Valley is typically dry, it experiences severe impacts during storms. Generally, shallow streams overgrown with grass struggle to handle the large flows generated by flash floods. Inadequate road culverts and bridges often become obstructed by debris or silt, leading to flooding in low-lying areas, especially near the highway (DHHL, 2012).

Historical Storms: Waimānalo has been affected by at least 10 major storms over the last 82 years (since 1941. The drainage issue in Waimānalo is characterized by small-capacity channels that are heavily restricted by vegetation. This vegetation not only reduces the channel capacity but also produces debris that accumulates at bridges and culverts during flood events, causing flow blockages. The upper reaches of the channels tend to be steep, while the lower reaches extend through sandy soils along the coast, resulting in flat sections. Severe rainstorms lead to flooding in large areas of Waimānalo Valley due to small stream capacities, inadequate road crossings, and low-lying coastal plains. Residential and commercial lands, as well as roads and highways, can become inundated during these storms. The high velocities of stormwater on steeper areas pose a greater hazard to life and Property compared to the slower velocities in ponding areas (DHHL, 2012).

The existing drainage pattern is anticipated to be preserved with limited grading (fill and excavation) outside of the floodway. The site shall be graded to convey excess runoff towards the existing drainage swale along the east portion of the Property. The Project design is focused on green open space with classroom pods dispersed evenly throughout the site. Rain 0cisterns will be installed to reclaim water from rooftops, and the surrounding green space is focused on maximizing groundwater recharge. Some post-construction Best Management Practices, if necessary, may require an underground drainage system. This drainage system, if necessary, would daylight into the existing drainage swale.

4.12.1. Anticipated Impacts and Proposed Mitigation

The proposed improvements are not anticipated to have a substantial impact on existing infrastructure and utilities. All necessary utilities are existing and accessible through connection points along Hihimanu Street.

During the construction phase, there is a possibility of temporary disruptions to power and communication systems. However, these effects are expected to be minimal and short-term in nature. The Project's energy consumption is not expected to be significant, and appropriate measures will be taken to ensure the efficient use of energy resources; this includes incorporating photovoltaic systems to support the proposed buildings.

The establishment of utility and communication services for the Project will be coordinated with the relevant service providers to ensure proper connections and installation of infrastructure. Efforts will be made to minimize any potential disruptions and maintain effective communication throughout the Project.

4.13. Transportation and Roadways

The proposed Project is accessible from Hihimanu Street, which is a two-lane City street with a sidewalk

located along the makai side of the street providing direct multi-modal access to the Project Area. The dedicated parking and bicycle parking for the proposed Project is located approximately 550 feet from Hihimanu Street, towards the end of the internal driveway. Located on the southeast side of the Project, the parking lot is situated behind the existing buildings adjacent to the new administrative building.

To facilitate vehicular turnaround, drop-off, and pick-up, as well as bus loading and unloading, a 36-foot-wide driveway roundabout has been constructed. The turnaround is situated approximately 600 feet from the Hihimanu Street entrance, and over 200 feet beyond the traditional hale. Additionally, the Project Area is connected throughout using ADA-accessible walkways.

Fire Department access will be provided via the driveway, a fire-accessible lane utilizing the roundabout for turnaround. A new fire hydrant will be installed within the Project area along the driveway.

Vehicular traffic to and from the site is not expected to have any significant change. The length of the driveway and placement of the Project Area allows for all internal queuing and on-site parking, creating safer pedestrian and vehicular access. In addition, staggered pick-up and drop-off times and carpooling are supported and encouraged.

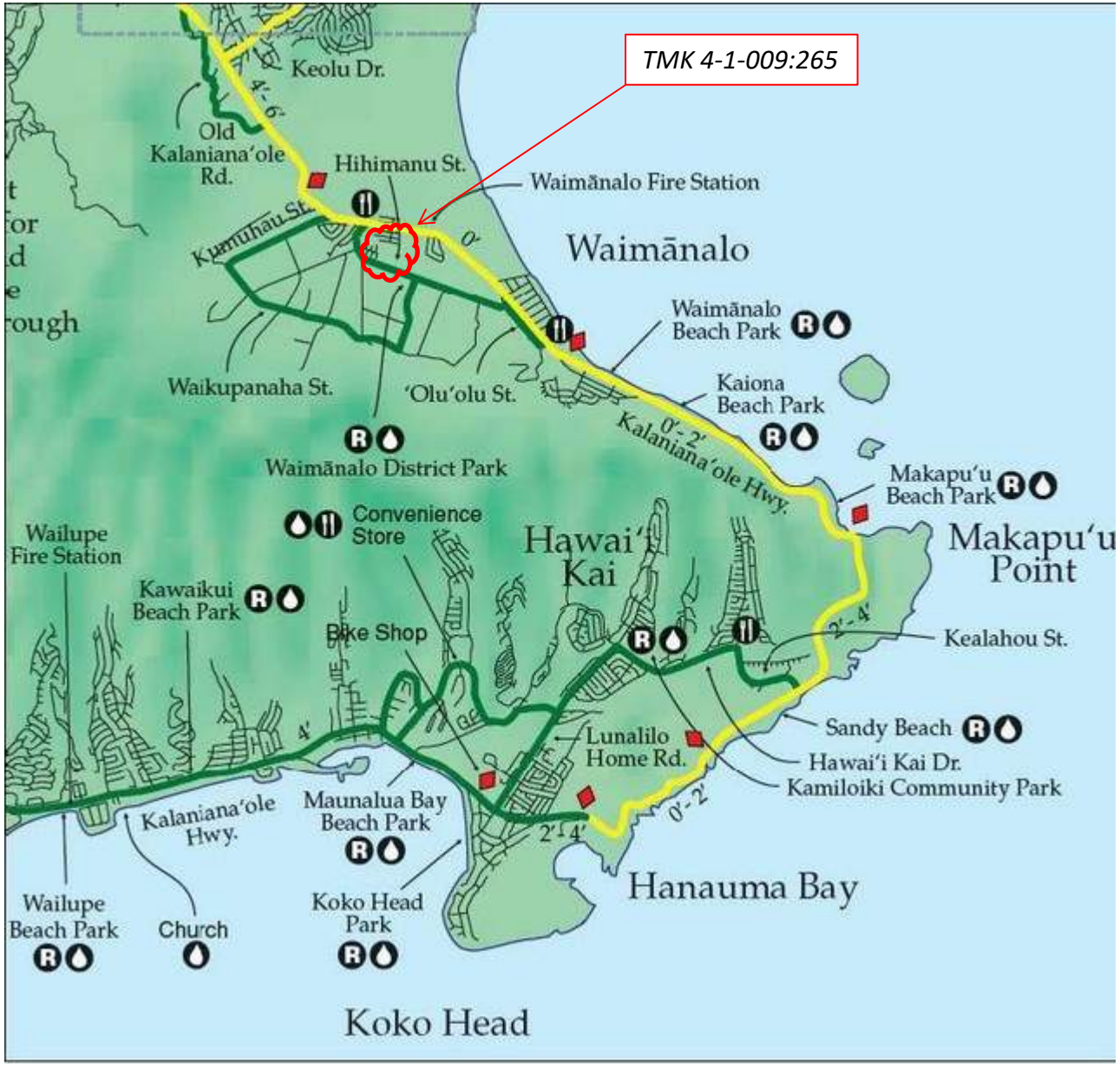
Pedestrian Pathways

There are two existing paved pedestrian access paths on either side of the Property, extending from Kalaniana‘ole Highway. One pedestrian access path links Kalaniana‘ole Avenue to Waimānalo District Park, which is situated between Waimānalo Elementary and Intermediate School and Hale Aupuni Subdivision. From the park, the pedestrian can walk thru the park to Hihimanu Street. The second paved path connects Waimānalo Village Corporation, located behind the Project Site, to Waimānalo Apartments immediately to the northwest of the Property, thereby linking Hauanaukoi Street and Kakaina Street, which connects to Hihimanu Street. These pedestrian access paths have been utilized by the surrounding community for generations and connect to the existing sidewalk located on Hihimanu Street (See Figure 16: Bike Map).

Roadways - Transportation System and Traffic Conditions

The Project Area is accessible from Hihimanu Street. Hihimanu Street is a collector street, intersecting with Kalaniana‘ole Highway at a stop-controlled, four-way intersection to the east and a single-stop sign intersection to the west of Hihimanu Street. Hihimanu Street is about 20 feet wide with inconsistent sidewalk availability. Between Ahiki Street and Kalaniana‘ole Highway intersection to its east, there are no sidewalks. Within the vicinity of the Project Site, west of Ahiki Street, Hihimanu Street is about 22 feet wide with a sidewalk on the makai side of the roadway. Hihimanu Street reduces to a one-lane culvert crossing between Nonokio Street and Waikupanaha Street (0.6 miles west of the Project Area). The posted speed on Hihimanu Street is 25 mph. Hihimanu Street continues as Poalima Street to Kalaniana‘ole Highway (TMC, 2019).

The main roadway servicing the area is Kalaniana‘ole Highway, which is a two-lane, two-way arterial highway, which provides access through Waimānalo. Kalaniana‘ole Highway links Ko‘olau Poko communities to East Honolulu and serves as a scenic, secondary route for travel between Kailua/Waimānalo and Honolulu. In general, traffic conditions in Waimānalo can vary depending on the time of day and the season. During weekends and peak tourism season, traffic can become congested, particularly near popular destinations. The posted speed on Kalaniana‘ole Highway varies between 25 miles per hour (mph) and 35 mph. Kalaniana‘ole Highway carries about 18,000 vehicles per day, total



LEGEND FOR MAPS

	Suggested Routes for Novice Bicyclists These include bicycle paths, roads with bicycle lanes or roads that are wide enough to accommodate bicyclists
	Suggested Routes for Experienced Bicyclists These include roads with space for adequate shared use between bicyclists and motorists
	Routes Which Are Not "Bicycle Friendly" These include roads that have heavy traffic and do not have adequate shared use between bicyclists and motorists
R	Restrooms
	Water
	Food
	Significant Grade
	Average Paved Shoulder Width

Figure 16: Bike Map

Source: Hawaii Department of Transportation - Highways

for both directions (TMC, 2019).

The 2035 Oʻahu Regional Transportation Plan (ORTP) serves as a guide for the development of recommended major surface transportation facilities and programs, identifying short- and long-term plans for major highway projects, transit improvements, and transportation demand management (TDM) measures (e.g., park-and-ride lots and rideshare programs). Between 2011 and 2020, ORTP listed "Construct operational and safety improvements to Kalaniana'ole Highway between Olomana Golf Course and Waimānalo Beach Park" as one of its projects in Koʻolau Poko (BPSD, 2017). Construction to upgrade road safety in Waimānalo began in 2016, installing new left turn lanes and installing safety and drainage improvements. The work (Poalima Street to Makai Pier) is scheduled to finish late Spring 2023; as of June 2023, lane closures were occurring in both directions for resurfacing and restriping work, a final step towards project completion (HIDOT, 2023).

Public Transportation:

To date, TheBus Routes 67, 69, and 89 provide transit service to Waimānalo. TheBus stops are located approximately 0.5 miles from the Project Site on Kalaniana'ole Highway; located one block away from Hihimanu Street on both sides of Poalima Street, Waimānalo's only signalized intersection. Bus stops are also located on the east end of Hihimanu Street, 1.2 miles from the Project Site.

The Property is in proximity to various multi-modal transportation options. Public transportation, including bike lanes, is available within a distance of less than 0.5 miles from the site. The transportation infrastructure is designed to ensure safe and easy access, with dedicated sidewalks and paved pathways connecting the site to these transportation options. To further enhance pedestrian safety, the Project supports the installation of pedestrian signage as recommended in the traffic study.

The site's advantageous location also allows for direct access to nearby activity centers such as the district park and Hawaii Job Corps Training Center. Additionally, with HMK and MHPCS located on the same site, students can participate in both programs without having to relocate to another site. This proximity to activity centers promotes social equity by providing youth with improved access to community resources, neighborhood centers, and various activities. It fosters social connectivity and a sense of community not only for the youth but also for the entire community.

Overall, the Project Area's strategic location enhances accessibility and promotes social equity, contributing to the well-being and engagement of the youth and the community as a whole.

4.13.1. Anticipated Impacts and Proposed Mitigation

According to the TMC 2019 study, the proposed relocation and expansion of MHPCS is expected to alleviate the existing traffic demands on Kalaniana'ole Highway between Poalima Street and Hihimanu Street. This will be achieved by redirecting school traffic to Hihimanu Street. The redirection of school traffic away from the main highway, and creating a unified MHPCS is anticipated to reduce congestion and improve traffic flow in the area, especially when the two satellite sites are no longer used.

To ensure the safety of students and motorists, appropriate school warning signs and school speed limit signs can be installed along Hihimanu Street in accordance with the guidelines outlined in the Manual on Uniform Traffic Control Devices. The specific locations and installation of these signs will be determined

in collaboration with the City and County of Honolulu.

MHPCS is committed to minimizing vehicular and pedestrian traffic to and from the school. The school will continue to organize carpools, encouraging shared transportation among students and families. Additionally, staggered drop-off and pick-up schedules will be implemented, facilitated by various before and after-school programming. The collaboration with HMK, which provides afterschool programming to the students, further supports the coordination of staggered schedules and reduces traffic congestion during peak times.

By implementing these measures, MHPCS and HMK aim to effectively manage traffic, prioritize student and participant safety, and minimize disruptions in the surrounding area.

4.14. Public Services

Police, Fire, and Emergency Response
The City and County of Honolulu Police Department (HPD) provides police protection to the entire island of Oʻahu. The Project Site falls within the jurisdiction of the HPD's District 4, Kāneʻohe/Kailua/Kahuku, which extends from Makapuʻu Point to Kawela Bay on the windward side of Oʻahu. District 4 is divided into four sectors. The Property is within Sector 1, Waimānalo. The nearest police substation is the Kailua Substation on Kuʻulei Road, located 5.4 miles to the north in Kailua. The City and County of Honolulu Fire Company 27 is located at 41-1301 Kalanianaʻole Highway in Waimānalo, located 1.0 miles from the Property. The station includes ambulance service. The nearest emergency hospital is Adventist Health Castle (Castle Medical Center) in Kailua, 4.1 miles to the north.

Schools
Waimānalo is located within the State of Hawaiʻi Department of Education's Kailua- Kalāheo Complex. The public schools located in Waimānalo include Waimānalo Elementary, MHPCS, and Blanche Pope Elementary School. Kamehameha Schools Preschool Waimānalo is an independent school. The closest high school serving the community is Kailua High School, located roughly 4.2 miles from the Project Site.

Health Care and Social Services
Waimānalo is served by the Waimānalo Health Center, a community-based non-profit that provides primary health services. Waimānalo Health Center is located on Kalanianaʻole Highway approximately 1.0 mile to the north. Emergency and hospital facilities are provided by Castle Medical Center in Kailua, approximately 4.1 miles to the north.

Parks, Open Space, and Recreational Facilities
Waimānalo includes a variety of county-owned and operated parks, including the Waimānalo District Park (0.5 miles from the Project Site), Kaiona Beach Park, Kaupō Beach Park, Waimānalo Beach Park, Waimānalo Bay Beach Park, and Makapuʻu Beach Park. Bellows Field Beach Park, while owned by the military, is accessible to the public on weekends and holidays and provides campsites.

4.14.1. Anticipated Impacts and Proposed Mitigation

No significant adverse impacts to police, fire, medical, or emergency shelter services will occur from the completion of the proposed Project. The proposed Project will be designed in consideration of fire department access and required fire flow for fire protection.

MHPCS and HMK will continue to partner with Waimānalo Health Center and the City and County Parks and Recreational related to educational programming and learning opportunities.

4.15. Noise

The main source of human-induced noise in the vicinity of the Project Area is primarily attributed to vehicle traffic on Kalaniana‘ole Highway. Generally, the traffic volumes on this main arterial road through Waimānalo are low, increasing during peak travel periods in the morning and late afternoon.

To regulate and manage noise levels, the State of Hawai‘i has established the Community Noise Control Rule (HAR §11-46), which defines maximum permissible sound levels based on different zoning districts. In Class A zoning districts, which include residential, public space, and open space areas, the maximum permissible sound levels are set at 55 A-weighted decibels (dBa) during the daytime (7 am to 10 pm) and 45 dBa during nighttime (10 pm to 7 am). Any noise sources exceeding these levels are required to obtain a permit before conducting related activities.

Considering the proximity of the Project to residential areas, noise generated from school activities may be a potential concern for nearby residents.

4.15.1. Anticipated Impacts and Proposed Mitigation

During the construction period, noise levels in the vicinity of the Project Area will be affected. The use of heavy equipment for site grading and construction activities will result in intermittent and unavoidable audible noise. However, all construction activities will adhere to the State Department of Health community noise standards outlined in HAR Title 11, Chapter 46, "Community Noise Control."

Quieter construction activities such as building erection and equipment installation may not be audible, if not temporary in nature, and will cease upon completion of the Project.

To minimize the potential noise impacts during construction, the Project can implement measures such as the installation of sound barriers and scheduling construction work during daytime hours. These efforts can help mitigate the noise levels and minimize disturbance to nearby residents.

Once the construction is completed, noise associated with the school and any related events is not anticipated to create a significant nuisance for residents, as the Project is located away from residential dwellings. The site plan for the Proposed Project incorporates open play areas between the buildings and within the Project Area, breaking up noise. Further, the location of Project Area is located adjacent to a heavily overgrown area outside of the Property to the immediate northwest. The adjacent trees and proposed Structures act as a sound barrier, intercepting and absorbing sound waves, and blocking out the noise that may be generated from the Project Area. Additionally, maintaining a close relationship with nearby residential associations, neighbors, and businesses will allow for ongoing communication to address concerns and find solutions to minimize the impact of school noise on the surrounding community.

5. Relationship to State and County Land Use Plans and Policies

This chapter discusses the proposed Project’s conformance with relevant state and county land use plans, policies, and controls.

5.1. State Land Use Districts

The State Land Use Law (Chapter 205, HRS) is intended to preserve, protect, and encourage the development of lands in the State for uses that are best suited to the public health and welfare for Hawai'i's people.

All lands in the State are classified into four land use districts by the State of Hawai'i, Land Use Commission: Urban, Agricultural, Conservation, and Rural. The Project Site is located within the State Urban District. Permitted uses within the State Land Use Districts are prescribed under Chapter 205, HRS, and the State Land Use Commission's Administrative Rules (HAR Title 13, Chapter 13).

Discussion:
The Project Site is located within the State Urban District (see Figure 17: State Land Use Designation Map). The Proposed Action is consistent with the intent of the Urban District. It does not require any action or approval from the State Land Use Commission to amend the existing land use designation.

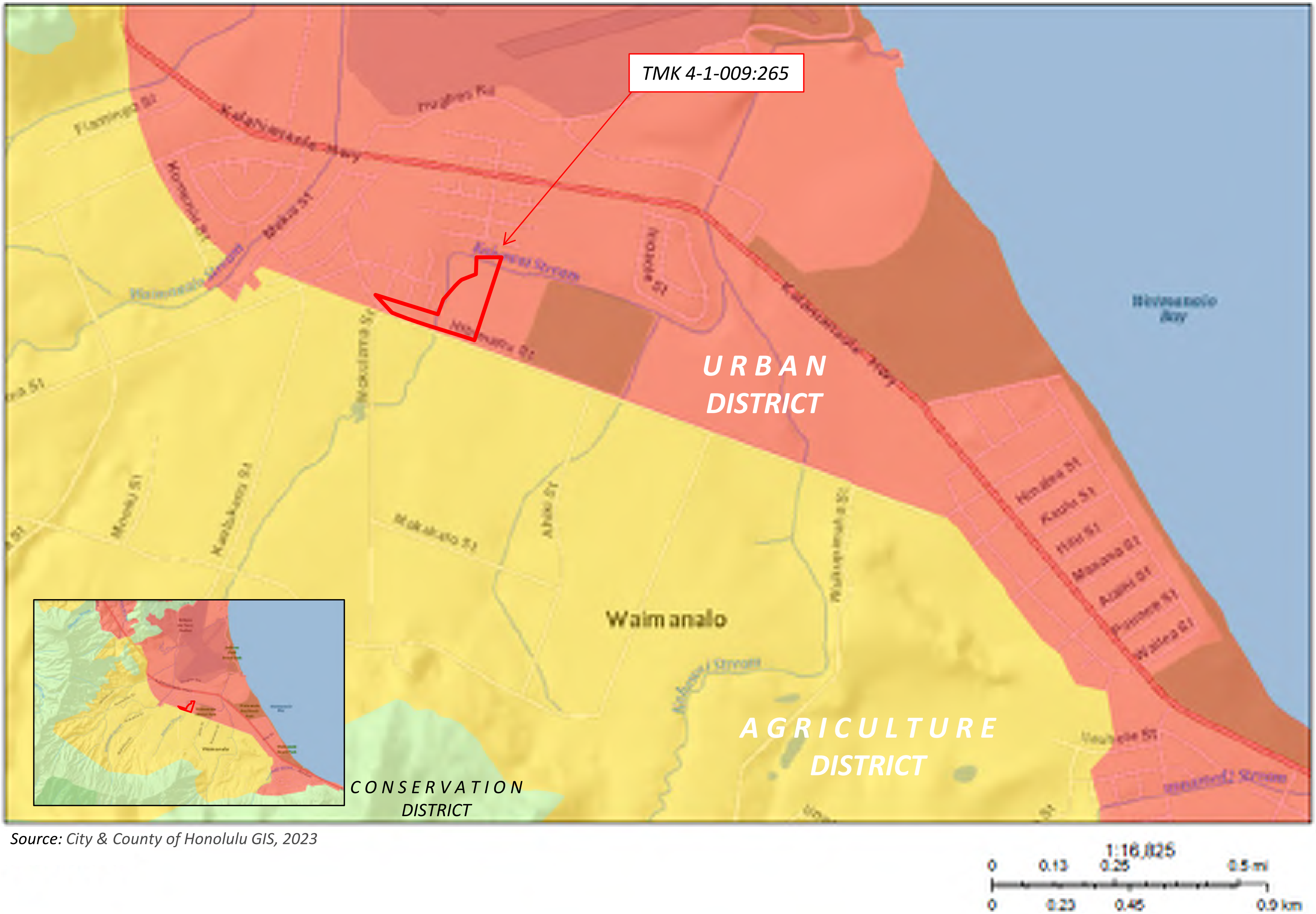
5.2. Hawai'i State Plan (HRS Chapter 226)

The Hawai'i State Plan (Chapter 226, HRS) outlines broad goals, policies, and objectives to serve as guidelines for long-range comprehensive growth and development of the State. The Hawai'i State Plan is divided into three parts:

- Part I, Overall Theme, Goals, Objectives, and Policies. Part I focuses on general topic areas including population, economy, physical environment, facility systems, and socio-cultural advancement.
- Part II, Planning Coordination and Implementation. Part II establishes a statewide planning system to coordinate major state and county activities and to implement the overall theme, goals, objectives, policies, and priority guidelines. These are implemented through State Functional Plans.
- Part III, Priority Guidelines. This part of the State Plan establishes overall priority guidelines to address areas of statewide concern.

Discussion:
Upon reviewing HRS Chapter 226, the Proposed Action is in alignment with the State's vision for economic growth and sustainability. By providing educational opportunities for youth, promoting environmental stewardship, and cultural activities, the Proposed Action supports the current and future well-being of Hawai'i. This particularly aligns with the State's priority objectives which emphasize the importance of socio-cultural advancement in education and culture. The excerpts below are Hawai'i State Plan objectives, policies, and priority guidelines that pertain to the proposed Project.

- §226-4 State goals….for present and future generations….that ensure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve: (1) A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii's present and future generations. (2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people. (3) Physical, social, and economic well-being, for individuals and families in Hawai'i, that nourishes a sense of community responsibility, of caring, and of participation in



Source: *City & County of Honolulu GIS, 2023*

Figure 17: State Land Use Designation Map

community life.

- §226-5 Objective and policies for population. (3) Promote increased opportunities for Hawai'i's people to pursue their socio-economic aspirations throughout the islands.

- §226-6 Objectives and policies for the economy--in general. (20) Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new or innovative potential growth industries in particular.

- §226-7 Objectives and policies for the economy--agriculture. (5) Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawai'i's economy. (11) Increase the attractiveness and opportunities for an agricultural education and livelihood. (12) In addition to the State's priority on food, expand Hawai'i's agricultural base by promoting the growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises. (17) Perpetuate, promote, and increase the use of traditional Hawaiian farming systems, such as the use of loko i'a, māla, and irrigated lo'i, and the growth of traditional Hawaiian crops, such as kalo, 'uala, and 'ulu. (18) Increase and develop small-scale farms.

- §226-10 Objective and policies for the economy--potential growth and innovative activities. (7) Enhance and promote Hawai'i's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts.

- §226-12 Objective and policies for the physical environment--scenic, natural beauty, and historic resources. (3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, oceans, scenic landscapes, and other natural features.

- §226-13 Objectives and policies for the physical environment--land, air, and water quality. (a) Planning for the State's physical environment about land, air, and water quality shall be directed towards the achievement of the following objectives: (1) Maintenance and pursuit of improved quality in Hawai'i's land, air, and water resources and (2) Greater public awareness and appreciation of Hawai'i's environmental resources. Therefore, it is the policy of the State to (1) Foster educational activities that promote a better understanding of Hawai'i's limited environmental resources. (2) Promote the proper management of Hawai'i's land and water resources. (4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i's people; (5) Reduce the threat to life and Property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters; (6) Encourage design and construction practices that enhance the physical qualities of Hawai'i's communities; (7) Encourage urban developments near existing services and facilities; and (8) Foster recognition of the importance and value of the land, air, and water resources to Hawai'i's people, their cultures and visitors.

- §226-16 Objective and policies for facility systems--water. (3) Reclaim and encourage the productive use of runoff water and wastewater discharges.

- HRS §226-21 Objectives and policies for socio-cultural advancement – Education. (a) Planning the State's sociocultural advancement about education opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations. (1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups. (2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs. (3) Provide appropriate educational opportunities for groups with special needs. (4) Promote educational programs which enhance understanding of Hawai‘i’s cultural heritage. (7) Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning. (8) Emphasize quality educational programs in Hawai‘i's institutions to promote academic excellence. (9) Support research programs and activities that enhance the education programs of the State.

- HRS §226-22 Objectives and policies for socio-cultural advancement – social services. (a) Planning the State's sociocultural advancement about social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being. (1) Asset individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State’s fiscal capacities. (2) Promote coordination and integration among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and enhance their participation in society.

- §226-23 Objective and policies for socio-cultural advancement--leisure. (a) Planning for the State's socio-cultural advancement about leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations. It is the State’s policy to (1) Foster and preserve Hawai‘i's multicultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities. (3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance. (4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved. (7) Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawai‘i's people. (8) Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.

- §226-25 Objective and policies for socio-cultural advancement--culture. (a) Planning for the State's socio-cultural advancement about culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawai‘i's people. It shall be the State’s policy to (1) Foster increased knowledge and understanding of Hawai‘i's ethnic and cultural heritages and history of Hawai‘i. (2) Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawai‘i's people and which are sensitive and responsive to family and community needs. (3) Encourage increased awareness of the effects of proposed public and private actions

on the integrity and quality of cultural and community lifestyles in Hawai‘i. (4) Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawai‘i's people and visitors.

5.3. State of Hawai‘i, Office of Planning and Sustainable Development

The State of Hawai‘i, Office of Planning and Sustainable Development, gathers, analyzes, and provides information to the Governor to assist in the overall analysis and formulation of state policies and strategies.

The Office is guided by two statewide planning documents (1) the Hawai‘i State Planning Act, and (2) Engineering Hawai‘i’s Future.

5.3.1. Hawai‘i State Planning Act

A broad policy document, the Hawai‘i State Planning Act outlines activities, programs, and decisions made by local and state agencies. Hawai‘i’s Sustainability Priority Guidelines and Principles are set to promote sustainability through the Hawai‘i State Planning Act, they include:

1. Encouraging a balanced economic, social, community, and environmental priorities;
2. Encouraging planning that respects and promotes living within the natural resources and limits of the State;
3. Promoting a diversified and dynamic economy;
4. Encouraging respect for the host culture;
5. Promoting decisions based on meeting the needs of the present without compromising the needs of future generations;
6. Considering the principles of the ahupua‘a system; and
7. Emphasizing that everyone, including individuals, families, communities, businesses and government have the responsibility for achieving a sustainable Hawai‘i.

5.3.2. Engineering Hawai‘i’s Future

Engineering Hawai‘i's Future outlines the priorities of the administration, which cover various ongoing projects and initiatives. These priorities include planning for the effects of climate change, improving scientific and cultural knowledge to enhance the management of natural resources for present and future generations, reducing Hawai‘i's reliance on imported food, and coordinating the State's involvement in transit-oriented development to facilitate affordable housing, educational facilities, and state services, among others.

Discussion:
The proposed Project is in alignment with the Hawaii Station Planning Act and Engineering Hawaii’s Future plan. At the core of the proposed Project is creating adequate spaces and places for ‘āina-based, project-based, and cultural-based learning to develop the next generation of Hawai‘i’s leaders. Through the specific education programs that HMK and MHPCS offer, students can learn, practice, understand, and problem-solve complex issues about natural environment and socio-economic factors, while applying in-depth knowledge of Hawaiian history, culture, and practices.

5.3.3. Hawai‘i 2050 Sustainability Plan

The Hawai'i 2050 Sustainability Plan is a comprehensive framework document that outlines the State's long-term vision for economic, environmental, and social sustainability. It is currently being updated and was developed with extensive input from various stakeholders such as government agencies, businesses, non-profit organizations, and community members. The plan's purpose is to guide decision-making and resource allocation over the next several decades.

In 2021, the plan was updated to reflect a sustainable and achievable vision for the coming decade. The updated plan will be instrumental in coordinating and implementing Hawai'i's sustainability and climate adaptation goals, principles, and policies as required by Hawai'i Revised Statutes §226-65. The revised plan will also provide recommendations for a sustainable and resilient economic recovery for Hawai'i.

Discussion:
The Hawai‘i 2050 Sustainability Plan presents strategies and objectives to tackle various sustainability challenges, such as decreasing reliance on fossil fuels, supporting sustainable agriculture and local food systems, and preserving the distinct cultural and natural resources of Hawai‘i. Thus, the plan shares a common approach with HPCS and HMK, as it highlights the significance of collaboration and partnership among various stakeholders to achieve sustainability goals.

5.4. State of Hawai‘i, Department of Hawaiian Home Lands

The primary responsibilities of the Department of Hawaiian Home Lands (DHHL) are to implement the Hawaiian Homes Commission Act of 1920, as amended (HHCA) and the programs, policies, and direction established by the Hawaiian Homes Commission (HHC) on behalf of the native Hawaiian beneficiaries of the Trust. DHHL’s mission, as described in the 2002 DHHL General Plan is: “To manage the Hawaiian Home Lands Trust effectively and to develop and deliver lands to native Hawaiians. We will partner with others towards developing self-sufficient and healthy communities.”

The DHHL General Plan Update (November 2022) sets the vision and establishes goals and policies to guide the discussions and decision-making of the Hawaiian Homes Commission. The General Plan guides the DHHL plans, programs, and policies for the next 20 years. The General Plan identifies and discusses seven (7) priority areas, as well as ten (10) guiding principles.

The DHHL 2011 Waimānalo Regional Plan was prepared to facilitate DHHL’s partnerships with other government agencies, private sector entrepreneurs, and non-profit organizations as it develops its lands in Waimānalo. It is one of twenty (20) regional plans that provide DHHL and the homestead community opportunities to assess land use development factors, identify issues and opportunities, and identify the region’s top priority projects slated for implementation within the next three (3) years. Specifically, the regional plans are a means to:

- Identify data - people, lands, and infrastructure of homestead communities and the surrounding region;
- Identify what DHHL and other landowners are planning to do;
- Provide the primary mechanism for beneficiary input in the development of their homestead communities;
- Identify issues and potential projects; and

- Identify priority projects determined by the Department and homestead community

In Waimānalo, DHHL has 2,004.75 acres of land with land uses for residential, subsistence agriculture; industrial, general agriculture, community use, and conservation (see Figure 18: Hawaii Home Lands Map). Two (2) DHHL-owned parcels are located in the vicinity (within a mile) of the proposed Project: Kumuhau (11 acres of residential, TMKs 41008011 & 41023065) and Kaka'ina (8 acres of residential, TMKs 41008081, 91, and 10). The majority of DHHL's residential parcels are located east, mauka of Waimānalo Beach Park including its designated Village Center to support community services, which is also the location of one of the interim MHPCS satellite sites.

DHHL works in partnership with other government agencies, the private sector, and community organizations to develop its lands and improve community life. DHHL believes that partnerships are an effective way to leverage resources and capital investments, mitigate undesirable impacts of development, coordinate area growth, reduce risks in large-scale community projects, and create broad community benefits

Discussion:
Although the Property is not located on DHHL lands, the Kumuhau homestead is located 0.3 miles west of the Project Site and the remaining residential homesteads are located 1.3 miles east of the Project Area, mauka of Waimānalo Beach Park. MHPCS and HMK both have students and participants that live here. Visually, the homesteads bookend both sides of Hihimanu Street with the Project Area in between, creating a convenient and purposeful connection with the families and youth living in these residential communities.

In addition, Project Action is particularly aligned with DHHL priority areas: Healthy Communities and Natural and Cultural Resource Management, and the guiding principles: Mālama 'Āina, Cultural Grounding and Education, and Social and physical well-being. In a similar vein, similar to DHHL, the Project Actions seek to:

- Support self-sufficient, healthy, resilient, and culturally grounded individuals (Healthy Communities)
- Manage and steward State lands to sustain health, resilience, and abundance for future generations through educating and practicing Mālama 'Āina.
- Support the teaching and practice of cultural traditions including 'ōlelo Hawai'i, traditional agriculture, hula, healing practices, and sustainable management of the 'āina. Preserve and perpetuate cultural resources and wahi pana (legendary place/s) throughout the islands.
- Create safe and healthy communities for keiki, adults, and kūpuna to thrive. Foster relationships with community partners that support the social, physical, and mental health of students, families, and participants.

The proposed uses are complementary and beneficial to DHHL plans and directly supportive of its mission.

5.5. State of Hawai'i, Department of Health, Hawai Physical Activity and Nutrition (PAN) Plan 2020

PAN Plan 2020:
The Hawai'i Physical Activity and Nutrition Plan 2020 (PAN Plan 2020) was developed as a rallying

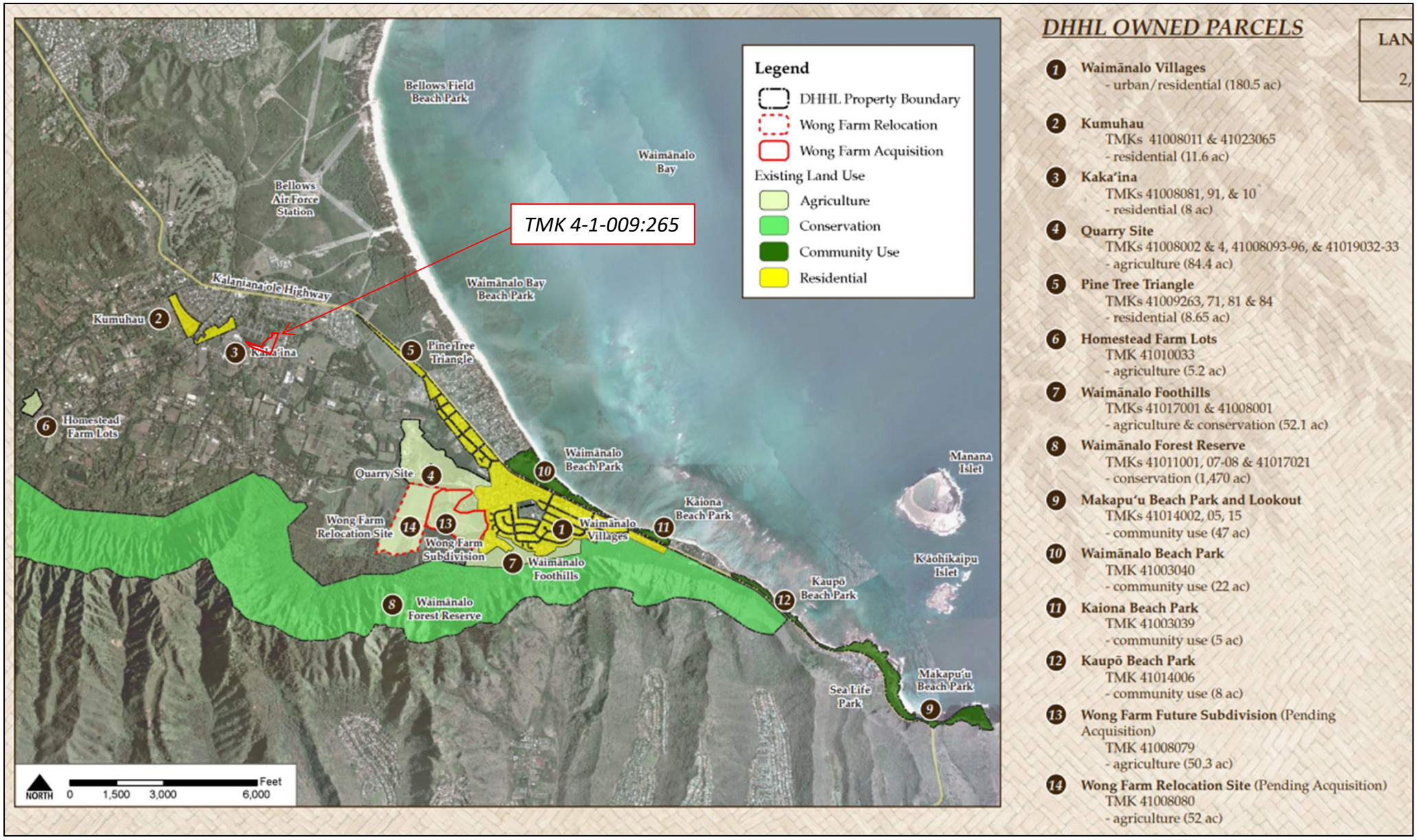


Figure 18: Hawaiian Home Lands Map

Source: DHHL. "Waimanalo Regional Plan". November 2011

document for action for all who want to make a difference. Hawai'i is viewed as a healthy state when compared to other states on many indicators of morbidity and mortality. However, obesity rates are rising sharply statewide, with unacceptably high rates of obesity in most population groups. Nearly one-third of children entering Kindergarten are already overweight or obese, and the rates remain similarly high among students enrolled in public secondary schools. The rates of overweight among adults are much higher, with over half of adults exceeding acceptable Body Mass Index (BMI) standards. (DOH, 2023).

The PAN Plan 2020 describes strategies to increase physical activity and healthy eating, with long-term goals of reducing overweight, obesity, and chronic disease among all Hawai'i residents. Its purpose is to provide a framework for policymakers, public and private organizations, and community members to work together to educate, advocate for policies, and build an environment that allows our residents to embrace a physically active and nutritionally sound lifestyle.

Discussion:
Specifically applicable to the proposed Project, Educational Systems, Objective 12: Increase educational opportunities for students and staff to learn about nutrition and agriculture.

The Proposed Action will create the physical space for youth, families, and the community to learn and practice physical activities, outdoor recreation, and wellness programs in a structured and deliberate environment. The Proposed Action will create opportunities for students to connect with nature, reduce stress, and develop healthy practices and habits that can benefit them throughout their lives. Promoting physical health (cardiovascular, musculoskeletal), mental health, and a healthy lifestyle will contribute to overall better public health outcomes.

5.6. O□ahu General Plan

The City's planning process consists of three distinct tiers.

- Tier 1 (Section 5.7 of this EA): The General Plan establishes policy guidance for O'ahu as a whole, with all subsequent plans and implementing regulations of the City and County of Honolulu required to be consistent with the General Plan.
- Tier 2 (Section 5.8 of this EA): Consists of the eight regional Development Plans (DPs) and Sustainable Communities Plans (SCPs). These plans relate to specific regions of the island and 1) conceptually describe the pattern of land use desired for the region; 2) provide guidance for functional infrastructure planning; and 3) identify areas within the DP/SCP boundary that might benefit from more detailed planning.
- Tier 3 (Section 5.9 of this EA): Discusses the specific mechanisms to implement the two higher levels of the planning hierarchy. These include the implementing ordinances and regulations (i.e., the Land Use Ordinance, Honolulu's zoning code), the Subdivision Rules and Regulations, and the City's Capital Improvement Program), public facilities and infrastructure functional plans, and special area plans that give specific guidance for specific portions of the DP or SCP area.

The General Plan of the City and County of Honolulu sets forth aspirational objectives and policies that address the physical, social, cultural, economic, and environmental concerns affecting the City and County of Honolulu. The General Plan for the City and County of Honolulu was first adopted in 1977 and has been subsequently amended, most recently in 2021. 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 Oʻahu, including broad policy statements that facilitate the attainment of the Plan's objectives.

The General Plan is organized into 11 areas of concern: population; economy; natural environment and resource stewardship; housing and communities; transportation and utilities; energy systems; physical development and urban design; public safety and community resilience; health and education; culture and recreation; and government operations and fiscal management.

"Achieving sustainability requires recognizing the relationships and linkages between all resources within defined boundaries similar to the values of the traditional Native Hawaiian ahupuaʻa land use management system that encourages stewardship, and compatible principles from contemporary watershed management." (Oʻahu General Plan, 2021)

Discussion:
The Proposed Action is consistent with the following policies and guidelines of the Revised General Plan. The Proposed Action provides a complementary service to the community, collaborating with a long-standing community program within its existing site.

Together, HMK and MHPCS programs broadly affect the community in positive and beneficial ways. The two programs complement one another as a school and out-of-school effort, committed to developing a thriving generation of young people using ʻāina -based and cultural-based learning as a foundation.

The programs and activities offered by HMK and MHPCS play a crucial role in delivering essential social services, sustaining natural environments, and preserving cultural heritage. These nonprofit organizations provide invaluable services that complement and enhance the work of the government.

By offering innovative educational opportunities to youth and families, HMK and MHPCS contribute to building the community's social fabric. They provide educational programs beyond traditional academic subjects, helping shape the next generation of leaders in Hawaii. Through their efforts, they guide and establish a strong foundation for the future leaders of the island, fostering skills, knowledge, and values that are essential for the overall development of individuals and the community as a whole.

In addition to education, these organizations also contribute to the preservation of natural environments and cultural heritage. By promoting sustainability and environmental stewardship, they encourage the preservation and protection of the natural resources on the island. They also play a vital role in preserving and sharing the rich cultural heritage of Hawaii, ensuring that traditions, history, and customs are understood and practiced by future generations.

The following identifies the objectives and policies with which the Proposed Action is aligned.

Chapter I. Population

Objective A: To plan for the anticipated population in a manner that acknowledges the limits of Oʻahu's natural resources, protects the environment, and minimizes social, cultural, and economic disruptions.

Policy 5: Support family planning and social equity.

Objective B: To establish a pattern of population distribution that will allow the people of O'ahu to live, work and play in harmony.
Policy 3: Manage land use and development in the urban fringe and rural areas so that: b. Population densities in all areas remain consistent with the character, culture, and environmental qualities desired for each community.

Chapter II. Balanced Economy

Objective C: To ensure the long-term viability and continued productivity of agriculture on O'ahu.
Policy 14: Promote farming as a desirable and fulfilling occupation by encouraging agricultural education and training programs and by raising public awareness and appreciation for agriculture.

Chapter III. NATURAL ENVIRONMENT AND RESOURCE STEWARDSHIP

Objective B: To preserve and enhance natural landmarks and scenic views of O'ahu for the benefit of both residents and visitors as well as future generations.
Policy 3: Locate and design public facilities, infrastructure, and utilities to minimize the obstruction of scenic views.

Chapter VI. ENERGY SYSTEMS

Objective A: To increase energy self-sufficiency through renewable energy and maintain an efficient, reliable, resilient, and cost-efficient energy system.
Policy 5: Support and participate in research, development, demonstration, commercialization, and optimization programs aimed at developing cost-effective and environmentally sound renewable energy supplies.
Policy 6: Support State and federal initiatives to utilize renewable energy sources.
Policy 9: Locate community facilities on sites that will be convenient to the people they are intended to serve.

Chapter VII. 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 7 Encourage the clustering of development to reduce the cost of providing utilities and other public services.
Policy 9 Locate community facilities on sites that will be convenient to the people they are intended to serve.

Objective B: To plan and prepare for the long-term physical impacts of climate change.
Policy 2 Coordinate plans in the private and public sectors that support research, monitoring, and educational programs on climate change.
Policy 3 Prepare for the anticipated impacts of climate change and sea level rise on existing communities and facilities through mitigation, adaptation, managed retreat, or other measures in exposed areas.

Objective E: To maintain those development characteristics in the urban fringe and rural areas

which make them desirable places to live.
Policy 4: Maintain rural areas that reflect an open and scenic setting, dominated by small to moderate-size agricultural pursuits, with small towns of low-density and low-rise character, and which allows modest growth opportunities tailored to address area residents' future needs.
Policy 6 Ensure the social and economic vitality of rural communities by supporting infill development and modest increases in heights and densities around existing rural town areas where feasible to maintain an adequate supply of housing for future generations.

Objective F: To create and maintain attractive, meaningful, and stimulating environments throughout Oʻahu.
Policy 7 Design public structures to meet high aesthetic and functional standards and to complement the physical character of the communities they will serve.
Policy 9 Recognize the importance of using Native Hawaiian plants in landscaping to further the traditional Hawaiian concept of mālama ʻāina and to create a more Hawaiian sense of place.

Objective G: To promote and enhance the social and physical character of Oʻahu's older towns and neighborhoods.
Policy 1 Encourage new construction in established areas to be compatible with the character and cultural values of the surrounding community.

Chapter IX. HEALTH AND EDUCATION

Objective A: To protect the health and well-being of residents and visitors.
Policy 5 Encourage healthy lifestyles by supporting opportunities that increase access to and promote consumption of fresh, locally grown foods.
Policy 8 Support efforts to improve and expand access to mental health, drug treatment, community-based programs, and other similar programs for those requiring such services.

Objective B: To provide a wide range of educational opportunities for the people of Oʻahu.
Policy 1: Support education programs that encourage the development of employable skills.
Policy 2: Encourage the provision of informal educational programs for people of all age groups.
Policy 3: Encourage the after-hours use of school buildings, grounds, and facilities.
Policy 4: Encourage the construction of school facilities that are designed for flexibility and high levels of use.
Policy 5: Facilitate the appropriate location of childcare facilities as well as learning institutions from the preschool through the university levels.
Policy 6: Encourage outdoor learning opportunities and venues that reflect our unique natural environment and Native Hawaiian culture.

Chapter X. CULTURE AND RECREATION

Objective A: To foster the multiethnic culture of Hawaiʻi and respect the host culture of the Native Hawaiian people.
Policy 1 Recognize the Native Hawaiian host culture, including its customs, language, history, and close connection to the natural environment, as a dynamic, living culture and as an integral part of Oʻahu's way of life.
Policy 2 Promote the preservation and enhancement of local cultures, values, and traditions.
Policy 3 Encourage greater public awareness, understanding, and appreciation of the cultural

heritage and contributions to Hawai‘i made by O‘ahu’s various ethnic groups.

Objective B To protect, preserve and enhance O‘ahu’s cultural, historic, architectural, and archaeological resources.
Policy 7 Encourage the protection of areas that are historically important to Native Hawaiian cultural practices and to the cultural practices of other ethnicities, in order to further preserve and continue these practices for future generations.

Objective D To provide a wide range of recreational facilities and services that are readily available to residents and visitors alike, and to balance access to natural areas with the protection of those areas.
Policy 10 Utilize our unique natural environment in a responsible way to promote cultural events and activities and maintain cultural practices.
Policy 11 Encourage the after-hours, weekend, and summertime use of public-school facilities for recreation

5.7. Ko□olau Poko Sustainable Communities Plan (SCP)

The Ko‘olau Poko SCP was prepared in 2000 in accordance with the Charter-prescribed requirements for development plans. As one of eight community-oriented plans, it is intended to help guide public policy, investment, and decision-making through the 2020 planning horizon.

The Ko‘olau Poko region spans from Ka Lae O Ka ‘Ō‘io in the north to Makapu‘u Point in the south and is further defined by the peaks of the Ko‘olau Range and the shoreline. The Ko‘olau Poko Sustainable Communities Plan Area (SCPA) includes the rural communities of Waikāne, Waiāhole, Kahalu‘u, He‘eia, and Waimānalo, including the suburban communities of Kāne‘ohe and Kailua (See Figure 19: Ko’olau Poko Region).

The SCP’s vision statement and implementing policies are shaped around two principal concepts, the first which calls for the protection of the communities’ natural, scenic, cultural, historic, and agricultural resources, and the second which addresses the need to improve and replace, as necessary, the region’s aging infrastructure systems.

Discussion:
The Proposed Action aligns with the foundational concepts that underpin the vision and policies of the Ko'olau Poko Sustainable Communities Plan (SCP). The proposed Project seeks to enhance a community-serving facility, improving the overall facility and existing infrastructure, while ensuring that the proposed Project design adheres to the surrounding scenic views, cultural, and historic environment. MHPCS and HMK actively engage in protecting natural and scenic resources and preserving cultural resources through its educational programming and partnerships with leaders in the community. Together, HMK and MHCPS will foster continued collaboration and growth within the community, facilitating opportunities for youth and families to increase awareness, knowledge, and engagement in the protection of natural, scenic, cultural, historic, and agricultural resources.

5.8. City and County of Honolulu Zoning

The City and County of Honolulu’s Land Use Ordinance (LUO) (Section 21, ROH) is its zoning ordinance,

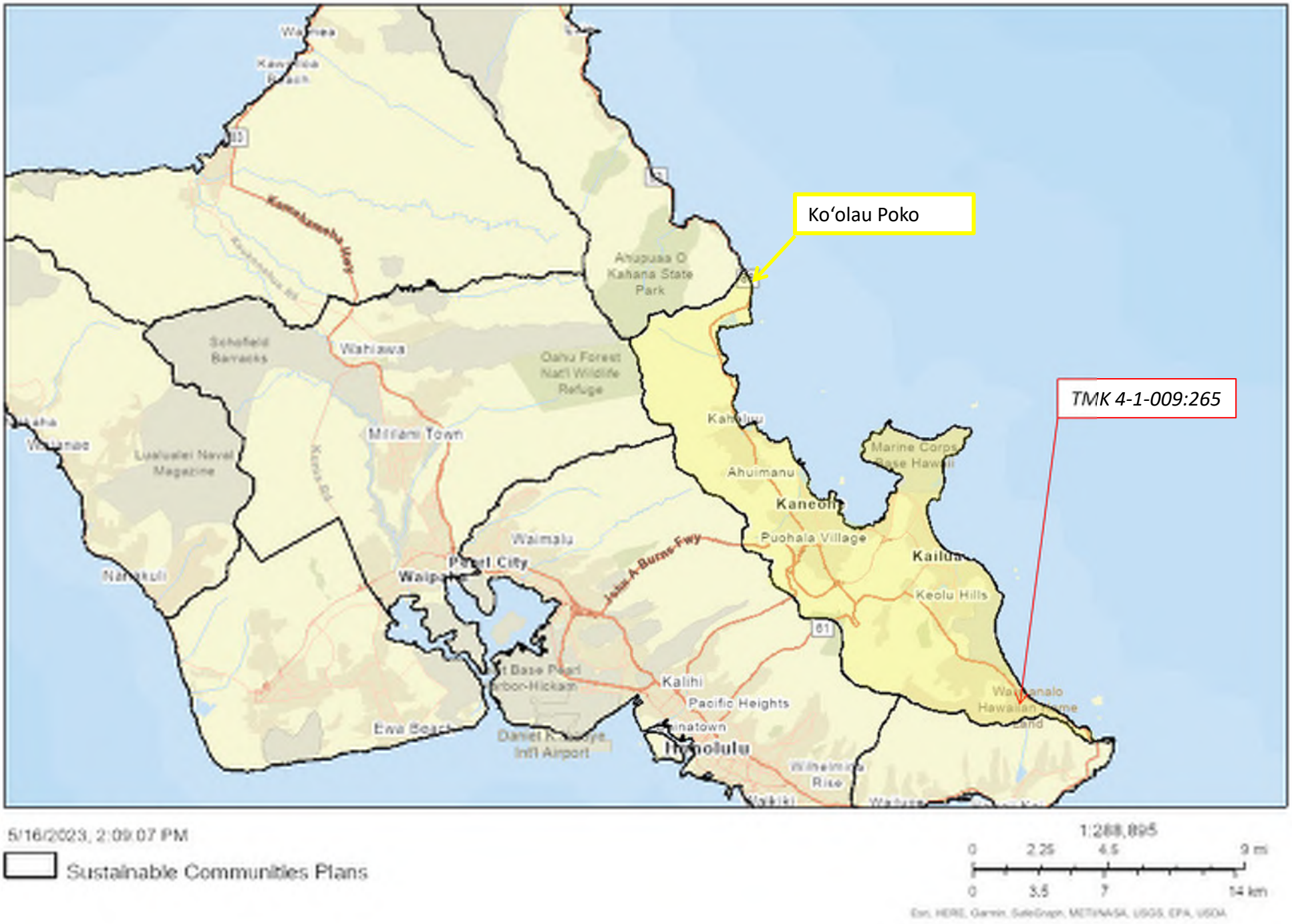


Figure 19: Ko‘olau Poko Region

which regulates land use in a manner that will encourage orderly development in accordance with adopted land use policies, including the General Plan and Development Plans.

Discussion:
The Project Area is zoned AG-2 (General Agricultural District) (see Figure 20: City and County of Honolulu Zoning Map). The intent of the AG-2 general agricultural district is to conserve and protect agricultural activities on smaller parcels of land.

The proposed land uses and activities are all compatible with the purpose of the agriculture districts as both organizations support backyard agriculture practices, and offer agriculture and gardening-related lessons as part of the educational program offered.

5.9. Special Management Area

Coastal Zone Management objectives and policies (Section 205A-2, HRS) and the SMA guidelines (Section 25-3.2 ROH) have been developed to preserve, protect, and where possible, restore the natural resources of the coastal zone of Hawai‘i.

Discussion:
As noted previously, the Project Area is outside the MA and is not subject to SMA requirements. The land uses proposed within the Project Area are consistent with many of the SMA objectives and are indirectly supportive of sound coastal management practices.

5.10. O‘ahu Resilience Strategy

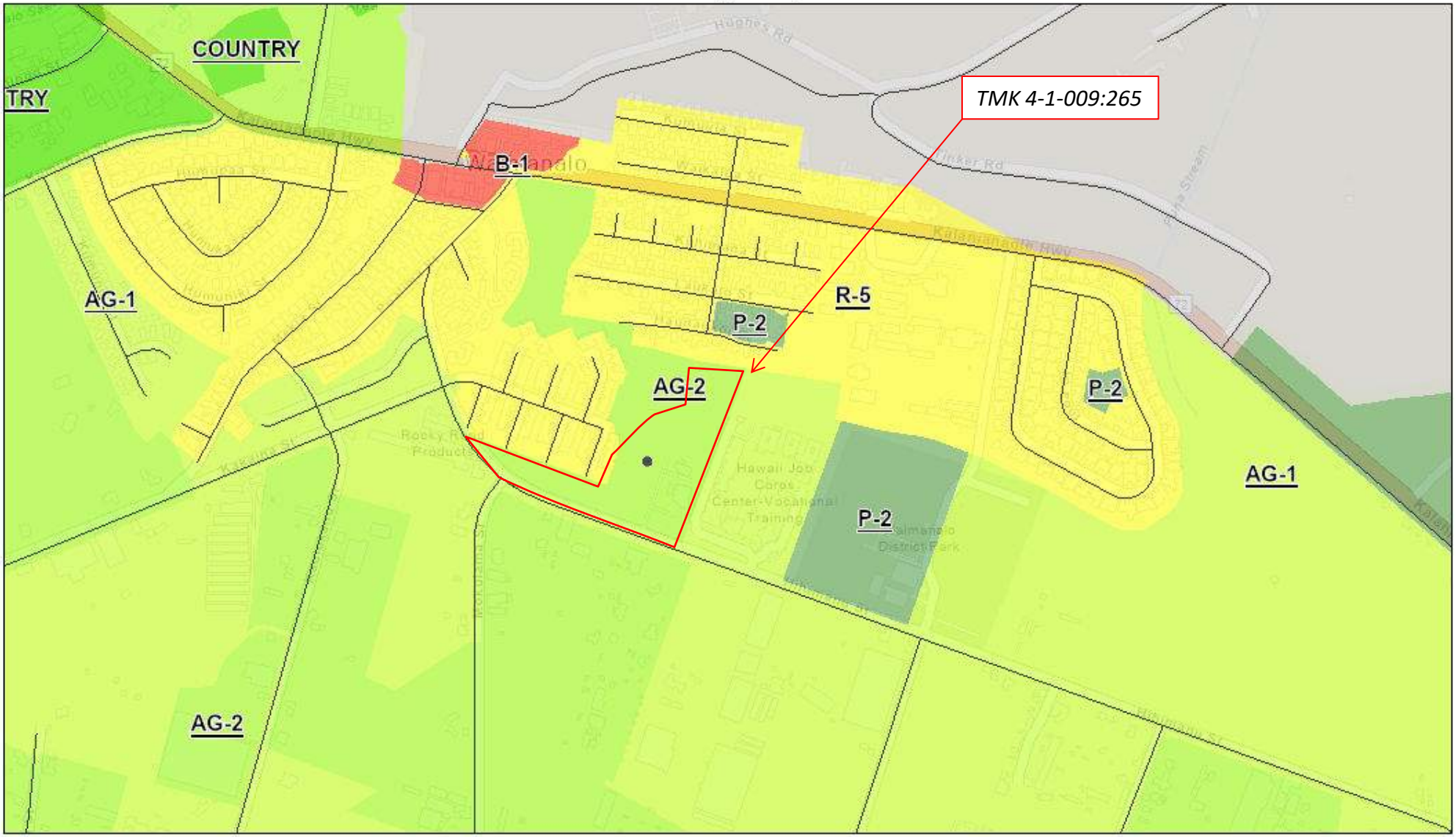
The O‘ahu Resilience Strategy, developed by the City’s Office of Climate Change, Sustainability and Resiliency, was formally adopted by the City Council in September 2019 (Resolution 19-233). To inform climate resilient planning while balancing “the challenge of long-term affordability and the impacts of a climate crisis that is already driving islanders from their homes, the Strategy includes four (4) pillars, 12 goals, and 44 actions for our community, City partners, and the City itself to implement. Together, The Resilience Strategy “will make O‘ahu economically more self-sufficient and safer as island people”.

The Pillars include:

- Pillar I: Ensuring an Affordable Future (local economy);
- Pillar II: Fostering Resilience in the Face of Natural Disaster (disaster preparedness);
- Pillar III: Tackling Climate Change by Reducing Emissions and Adapting to Impacts (climate security); and
- Pillar IV: Leveraging the Strength and Leadership of Local Communities (community cohesion).

Discussion: The Proposed Action is consistent with the following goals and action items of the O‘ahu Resilience Strategy (2019).

> PILLAR I. REMAINING ROOTED, Ensuring an Affordable Future for our Island
> Goal 3: Improving Economic Opportunity
> Action 10: Promote New Agricultural Models for Economic and Food Security



Source: City & County of Honolulu GIS, 2023

Figure 20: City and County of Honolulu Zoning Map

PILLAR II. BOUNCING FORWARD, Fostering Resilience in the Face of Natural Disasters
Goal 2: Effective Disaster Response
Action 15: Develop a Network of Community Resilience Hubs

PILLAR III. CLIMATE SECURITY, Tackling Climate Change by Reducing Emissions and Adapting to Impacts
Goal 3: Climate Resilient Future
Action 32: Deploy Sustainable Roof Systems to Manage Urban Heat and Rainfall
Action 33: Keep O ʻahu Cool by Maintaining and Enhancing the Community Forest

PILLAR IV. COMMUNITY COHESION, Leveraging the Strength and Leadership of Local Communities
Goal 1: Empower Grassroots Resilience Champions
Action 36: Increase City-Community Relationships through Volunteerism
Action 37: Weave a Tighter Community with Neighborhood Gatherings

Goal 2: Community and Affirm Island Values
Action 40: Lift Up Positive Examples of Island Values in Action
Action 42: Foster Shared Understanding of Climate Change Island-Wide Through an Outreach Campaign
Action 44: Create a City-Community Liaison to Leverage Non-Profit and Volunteer Asset.

MHPCS was inspired by the Worldwide Voyage of Hōkūleʻa. In 2013, Hōkūleʻa, the modern voyaging canoe circled the globe with a call to restore our central value of mālama honua (caring for the Earth), connecting local communities to demonstrate that the ability to thrive on island Earth is rooted in local communities taking action to maintain a sustainable future. HMK and MHPCS are dedicated to being positive outlets for community building and community empowerment. As an education and community program, the proposed activities that will occur within the Project Area are intended to broadly inform, inspire, and demonstrate the possibilities and opportunities in agriculture and food security (Pillar 1), demonstrate and showcase sustainable practices and community engagement (Pillars 3 and 4), while remaining rooted in Native Hawaiian values and practices that collaborate in ways that improve the long term resilience and sustainability of programs, people, and island Earth (Pillars 2 and 4).

5.11. Keeping Waimānalo, Waimānalo: Community Values & Priorities for the Future

The 2017 document titled "Keeping Waimānalo, Waimānalo: Community Values & Priorities for the Future" was collaboratively prepared by the Waimānalo community. Supported by facilitated community discussions, the purpose was to document the community's expressions and principles. Serving as a vital communication tool, this document conveys the community's vision, values, and priorities to both internal and external stakeholders. It is regarded as a dynamic document, subject to continuous evolution and enhancement through ongoing community engagement.

The goals of the Waimānalo Community Values and Priorities Exploratory Document are to:

- Explore and restore the resources within Waimānalo’s ahupuaʻa;
- Help maintain the community’s character over time;
- Express the community’s kuleana to Waimānalo and each other;

- Mobilize local and outside resources to get projects done and address community priorities;
- Provide guidance for Neighborhood Board and community organization decision-making;
- Communicate local priorities to city and state decision-makers; and,
- Communicate to newcomers and visitors an understanding of the fundamental values of Waimānalo.

Chapter 3.1 of the Exploratory Document conveys the vision for Waimānalo, representing how the community aspires to be, and the community values, which capture the qualities, attitudes, and beliefs that make Waimānalo special and should be perpetuated. The community's vision for Waimānalo is embodied in seven vision statements, summarized as:

- Keep Waimānalo, Waimānalo
- Value the wisdom of the people of Waimānalo
- Keep agriculture land-agricultural
- 'Ohana grow and thrive in Waimānalo
- Cultivate the values of caring for one another and community health and safety
- Support and sustain local businesses and organizations that contribute to a thriving community
- Manage our resource to preserve the Waimānalo ahupua'a

Discussion:
The Proposed Action demonstrates alignment with and endorsement of each community vision statement. MHPCS and HMK share the objective of transforming a portion of the Property into a comprehensive educational facility. This transformation will build upon the existing portion of the Property, which is already dedicated to serving the community through HMK's programs. The aim is to enhance and expand the educational offerings within the facility, providing a holistic and comprehensive learning environment for students and the broader community. By combining their efforts, MHPCS and HMK seek to create an educational facility that meets the diverse needs of the community and fosters the growth and development of its members.

Together, the educational programming offered emphasizes land-based learning and integrates agricultural and cultural activities. The Proposed Action seeks to collaborate closely with the Waimānalo community, fostering the transmission of wisdom and knowledge while emphasizing the unique and sustainable characteristics of both the Waimānalo community and our broader environment.

In pursuit of these goals, the Proposed Action encompasses several collaborative community activities, including the restoration of native plants, management of watersheds through techniques such as water reclamation and floodwater management, and control of invasive species.

The HMK and MHPCS programs play a direct role in enhancing the skills and knowledge of the younger generation. Furthermore, the Proposed Action aims to facilitate collaborative initiatives involving local businesses, organizations, and community leaders, thereby fostering a sense of unity within the community. Students are encouraged to explore agriculture and environmental stewardship within the curriculum, which, in turn, inspires career paths that may directly contribute to the prosperity of the community.

These activities effectively uphold the values of promoting education, cultivating leadership among younger individuals, and fortifying the overall Waimānalo community through opportunities,

interactions, and partnerships that bridge generations and foster knowledge exchange.

6. Determination of Significance

Hawai'i Administrative Rules, Title 11, Department of Health, Chapter 200.1 (Environmental Impact Statement Rules) establishes criteria for determining whether an action may have significant effects on the environment (§11-200.1-13). The relationship of the proposed Project to these criteria is discussed below.

1) Irrevocably commit a natural, cultural, or historic resource;
The Project Area is presently a vacant overgrown space. Should site work encounter subsurface deposits that are historic in nature, work in the immediate area will cease, and authorities notified of the finds.

The proposed Project within the Project Area will support ʻāina -based and culture-based education and programs that connect youth and community members to the natural environment and historic resources intricately tied to the cultural practices found in Waimānalo, Windward Oʻahu, and across the island. Through relevant and meaningful learning and partnerships, most of which will occur on-site, students and program participants will be provided ongoing opportunities grounded in sustainability and environmental stewardship.

2) Curtail the range of beneficial uses of the environment;
The proposed improvements increase and improve the range of beneficial uses of the environment. When compared to the current Project Area environment which has been overgrown with some of Hawaiʻi's most invasive plants for decades/generations, once the proposed Project is complete, invasive overgrowth will be removed and the existing Project Area will be used to explore the meaning and practice of environmental stewardship. This includes utilizing portions of the open space for native and non-invasive edible plant propagation and maintenance.

The students, participants, and families will be provided an education that focuses on building strong connections to the land and natural resources that sustain them, thereby instilling a sense of environmental stewardship and sustainability. Thus, students and participants will develop a sense of responsibility toward protecting and preserving their natural environment for generations to come.

3) Conflict with the State's environmental policies or long-term environmental goals established by law;
The Project is aligned with long-term environmental policies, goals, and guidelines of the State of Hawaiʻi.

The Proposed Action offers a valuable service to the community by operating two (2) established youth-focused programs within the same site, combining school-based and out-of-school efforts. Together, HMK and MHPCS will have a positive impact on the community; nurturing a thriving generation of young individuals through the integration of 'āina-based and cultural-based learning. Their collaborative efforts go beyond traditional academic subjects, aiming to cultivate future leaders. By fostering essential skills, traditional ecological knowledge, and Hawaiian cultural values, they contribute to the social and economic growth of the community, establishing a strong foundation for the development and well-being of its students and participants.

4) Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the

community and State;
The Project will provide positive effects that are beneficial to the economic and social welfare, and perpetuation of cultural practices and perspectives of the community and the State.

The Proposed Action will result in creating the physical space to support land- and cultural-based educational programming that will foster community engagement and resilience within and among communities. The improvements will allow people of all ages to work on community-based projects, further their work with local organizations, and continue to contribute to community development initiatives into the future. These activities can create a sense of civic responsibility, social connectedness, and community pride among youth, families, and community members while building skills, knowledge, and a sense of purpose to positively contribute to a thriving economic, social, and cultural community and State.

5) Have a substantial adverse effect on public health;
Public health will not be affected. Short-term environmental impacts in the form of construction noise can be expected during construction. These impacts can be mitigated by measures described in this EA.

The Proposed Action will create the physical space for youth, families, and community to learn and practice essential skills, traditional ecological knowledge, and Hawaiian cultural values; explore the natural environment through outdoor programming; and develop the knowledge and practice to support physical and mental well-being through a structured and deliberate program environment. The Proposed Action will create opportunities for students to connect with nature, reduce stress, and develop healthy practices and habits that can benefit them throughout their lives. Promoting physical health (cardiovascular, musculoskeletal), mental health, and a healthy lifestyle will contribute to improved public health outcomes.

6) Involve adverse secondary impacts, such as population changes or effects on public facilities;
Substantial secondary impacts on public facilities are not anticipated.

The Proposed Action offers a valuable service to the community by operating two (2) established youth-focused programs within the same site, combining school-based and out-of-school efforts. The improvements and the subsequent educational programs will permanently serve the existing community. The improvements will foster a sense of pride, belonging, and ownership among the students, participants, families, and the wider community who have been eagerly awaiting the opportunity to improve existing facilities and unify the school into a single site in Waimānalo.

Special events that require parking have typically been temporarily managed on-site, utilizing the open field. If needed, overflow parking options include the adjacent Hawaii Job Corps Center facility and Waimānalo District Park, with parking attendants directing traffic.

7) Involve a substantial degradation of environmental quality;
The Proposed Action will not involve substantial degradation of environmental quality.

The Proposed Action includes sustainable site selection, replacing highly invasive plants with a site design and layout that maximizes the outdoor learning environment and deliberately creating sustainable opportunities for learning, practice, and growth. This involves incorporating sustainable

materials, enhancing energy efficiency by maximizing natural daylight, utilizing natural ventilation, incorporating outdoor learning spaces, and installing solar water and electricity systems. Additionally, the Proposed Action promotes water conservation through the use of low-flow fixtures, water reclamation systems, and bioswales to enhance groundwater recharge. The project also focuses on cultivating native plants, canoe plants, and edible non-invasive species such as ulu, coconut, bananas, and jackfruit. Furthermore, waste management strategies, including composting, recycling, and practices that reduce the use of single-use plastics, will be implemented. Through these measures, the Proposed Action promotes environmental education and awareness while utilizing renewable and alternative energy sources and practices.

8) Be individually limited but cumulatively have substantial adverse effect upon the environment or involve a commitment to larger actions;
The Project does not involve a commitment to larger actions, nor will it have substantial adverse effects on the environment.

The Proposed Action is designed to promote environmental and cultural stewardship, fostering a sense of pride and belonging among the students, participants, and families involved. It aims to enhance the existing HMK facilities and new MHPCS facilities by providing additional physical space for its programs and activities, taking into account lessons learned from the pandemic regarding physical distancing and well-ventilated, open-air spaces. For MHPCS, the Proposed Action fulfills its objective of consolidating its satellite sites in Waimānalo into a single learning site. These improvements and the unification of the school site align with HMK and MHPCS goals. Together, the proposed Project is not intended to have substantial adverse effects on the environment and will not involve a commitment to larger actions.

9) Have a substantial adverse effect on a rare, threatened, or endangered species or its habitat;
Rare, threatened, or endangered flora and fauna are not present in the Project area.

The existing plants are all invasive that have colonized the area due to previous human disturbance (i.e., land clearing, agriculture, and dumping), which has displaced or degraded the native plant communities. The Proposed Action will disrupt and remove the invasive plant populations, reducing the abundance and/or eliminate most invasive species from the Project Area. The landscape plan and future programs and efforts focused on on-site agriculture education (i.e., gardens - native, canoe, and food-bearing species) will help to prevent or minimize the establishment and spread of invasive plants and promote regular monitoring and maintenance of the invasive species, thereby promoting healthier habitats that in time, could be revisited by rare, threatened or endangered fauna.

10) Have a substantial adverse effect on air or water quality or ambient noise levels;
Site work is the first major activity and grubbing and grading may result in temporary and intermittent impacts on air quality and ambient noise levels. Construction will generate noise that will be audible to nearby residents and dust could settle outside the project limits. Site work and building contractors are aware of dust and noise impacts and will comply with air quality and noise regulations of the State Department of Health. The general contractor will implement best management practice measures during construction.

The operational use of the buildings for educational and youth development programs focuses on teaching and learning about mālama ʻāina and sustainability through practices and beliefs rooted in

Native Hawaiian perspectives. The physical buildings include new water lines and sewer systems, and a 750-gallon grease interceptor will be installed in compliance with the Uniform Plumbing Code. There should not be a substantial adverse effect on air or water quality or ambient noise levels.

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, fresh water, or coastal waters;
Located adjacent to a flood plain, flood design principles, engineering, and construction techniques will be applied to minimize risk. This includes elevating buildings above the BFE and addressing stormwater management. Rainwater collection systems such as rain cisterns will capture excess rainwater; while rainwater diversion techniques such as bio-swales capture and manage excess water, increasing water recharge by allowing it to slowly infiltrate into the ground instead of running off.

12) Have a substantial adverse effect on scenic vistas and view planes, day or night, identified in county or state plans or studies.
The proposed improvements will not have an adverse effect on scenic vistas and view planes. All proposed structures are single-story buildings and will be located at the center of the 11-acre site, behind existing structures. Thus, the height and scale of the proposed structures are compatible with the surrounding landscape and do not obstruct or alter scenic vistas or viewsheds. Rather, the structures, adhering to City setback requirements, are designed similar to a small village with pods of classrooms, surrounded by landscaping, blending harmoniously with the nearby environment, preserving scenic vistas and view plans, day and night.

13) Require substantial energy consumption or emit substantial greenhouse gasses.
Substantial energy consumption is not anticipated.

The Proposed Action will contribute to improving environmental quality by optimizing energy efficiency by designing the buildings to accept natural daylight and natural ventilation. Solar water and electricity panels will be installed to utilize abundant solar energy. Ceiling fans in each classroom pod will be provided with LEDs. Both HMK and MHPCS strive to be sustainable, eliminating excessive energy consumption.

7. Coordination and Consultation

7.1. Early Consultation

The consulted agencies, organizations, and individuals are listed below. There were seven (7) formal responses to the pre-assessment consultation letter, as indicated by the symbol below. Comments and responses are included in Appendix A.

<u>State of Hawai'i:</u>
Department of Agriculture
Department of Business, Economic Development, and Tourism
Department of Hawaiian Homelands
Department of Health

- Clean Air Branch
- ☑ Clean Water Branch
- Environmental Planning Office

Department of Land and Natural Resources
- Historic Preservation Division
- Land Division

Department of Transportation
Office of Hawaiian Affairs
State Representative Lisa Marten (House District 51)
State Senator Chris Lee (Senate District 25)
☑ State Public Charter School Commission
University of Hawai‘i - CTAHR

City and County of Honolulu
Board of Water Supply
City Councilmember Esther Kia`āina - District 3
☑ Department of Design and Construction
Department of Emergency Services
☑ Department of Facility Maintenance
Department of Parks and Recreation
Department of Planning and Permitting
☑ Department of Transportation Services
☑ Honolulu Fire Department
☑ Honolulu Police Department
Mayor's Office - Office of Culture and Arts
Neighborhood Board Chairperson
Neighborhood Commission Office
Oahu Transit Services, Inc.
Office of Climate Change, Sustainability, and Resilience
Office of Economic Revitalization

Others
Hawaiian Electric Company, Inc.
Hawaii Job Corps Center
Waimānalo Farmers Union
Waimānalo Agricultural Association
Waimānalo Hawaiian Homestead Association
Waimānalo Banyan Tree Association
Waimānalo Village Residence Corporation

7.2. List of Agencies, Organizations, and Individuals to be consulted in the EA Process

Following the completion of the Draft EA, all those listed above, in addition to those listed below, will be contacted for comment and provided a reference link to the Draft EA.

Federal Agencies
U.S. Fish and Wildlife Service

Organizations & Individuals

Harold K.L. Castle Foundation
Hawaiian Civic Club of Waimānalo
Kamehameha Schools
Kānehūnāmoku
Kauluakalana
Neighboring TMKs
Waimānalo Limu Hui

Utilities
Charter Communications (dba Spectrum)
Hawai‘i Gas
Hawaiian Telcom

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In reply, please refer to:
EMD/CWB

10001CEC.22

October 7, 2022

MEMORANDUM

SUBJECT: Clean Water Branch Standard Project Comments

TO: Agencies and Project Owners

FROM: ALEC WONG, P.E., CHIEF
Clean Water Branch

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), Clean Water Branch (CWB) 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)
- Stream Channel Alteration Permits (SCAP)
- Stream Diversion Works Permits (SDWP)
- Well Construction/Pump Installation Permits
- Conservation District Use Applications (CDUA)
- Special Management Area Permits (SMAP)
- Shoreline Setback Areas (SSA)

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

DOH-CWB Standard Comments

The following information is for agencies and/or project owners who are seeking comments regarding environmental compliance for their projects with the Hawaii Administrative Rules (HAR), Chapters 11-53, 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program.

1. Any project and its potential impacts to State waters must meet the following criteria:

    a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

    b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

    c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for point source water pollutant discharges into State surface waters (HAR, Chapter 11-55). Point source means any discernible, confined, and discrete conveyance from which pollutants are or may be discharged.

    For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for a NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee ($1,000 for an individual NPDES permit or $500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

    The DOH, Environmental Health Administration (EHA) e-Permitting Portal received Cross-Media Electronic Reporting Rule (CROMERR) certification by the Environmental Protection Agency (EPA) for electronic signature. Currently, Applicants and Permittees may now certify and submit EHA Electronic Signature Forms electronically through the EHA e-Permitting Portal without the need to physically send in an ink signature and CD/DVD/flash drive.

Beginning January 31, 2023, the DOH-CWB will only utilize electronic signature e-Permitting forms and discontinue the hard-copy signature forms. All hard-copy signature certification e-Permitting forms, including compliance forms, will be inactivated.

The electronic signature forms will require electronic signature approval to submit a form to the CWB. For details on how to obtain the electronic signature approval please visit CWB website located at: https://health.hawaii.gov/cwb/announcements/cwb-announces-new-requirement-for-electronic-signature-approval-for-all-submissions-beginning-january-31-2023/.

The NPDES NOI or application will be processed after the filing fees submitted and payable to the "State of Hawaii in the form of a pre-printed check, cashier's check, money order, or as otherwise specified by the director is received by the CWB.

Some of the activities requiring NPDES permit coverage include, but, are not limited to:

a. Discharges of Storm Water

   i. For Construction Activities Disturbing One (1) or More Acres of Total Land Area.

      By HAR Chapter 11-55, an NPDES permit is required before the start of the construction activities that result in the disturbance of one (1) or more acres of total land area, including clearing, grading, and excavation. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale.

   ii. For Industrial Activities for facilities with primary Standard Industrial Classification (SIC) Codes regulated in the Code of Federal Regulations (CFR) at 40 CFR 122.26(b)(14)(i) through (ix) and (xi). If a facility has more than one SIC code, the activity that generates the greatest revenue is the primary SIC code. If revenue information is unavailable, use the SIC code for the activity with the most employees. If employee information is also unavailable, use the SIC code for the activity with the greatest production.

   iii. From a small Municipal Separate Storm Sewer System (along with certain non-storm water discharges).

b. Discharges to State surface waters from construction activity hydrotesting or dewatering

c. Discharges to State surface waters from cooling water applications

d. Discharges to State surface waters from the application of pesticides (including insecticides, herbicides, fungicides, rodenticides, and various other substances to control pest) to State waters

e. Well-Drilling Activities

Any discharge to State surface waters of treated process wastewater effluent associated with well drilling activities is regulated by HAR Chapter 11-55. Discharges of treated process wastewater effluent (including well drilling slurries, lubricating fluids wastewater, and well purge wastewater) to State surface waters requires NPDES permit coverage.

NPDES permit coverage is not required for well pump testing. For well pump testing, the discharger shall take all measures necessary to prevent the discharge of pollutants from entering State waters. Such measures shall include, if necessary, containment of initial discharge until the discharge is essentially free of pollutants. If the discharge is entering a stream or river bed, best management practices (BMPs) shall be implemented to prevent the discharge from disturbing the clarity of the receiving water. If the discharge is entering a storm drain, the discharger must obtain written permission from the owner of the storm drain prior to discharge. Furthermore, BMPs shall be implemented to prevent the discharge from collecting sediments and other pollutants prior to entering the storm drain.

3. A Section 401 Water Quality Certification (WQC) may be required if your project/activity:

a. Requires a federal license or permit; and

b. May result in a discharge into waters of the United States (WOTUS).

"License or permit" means any permit, certificate, approval, registration, charter, membership, statutory exemption, or other form of permission granted by an agency of the federal government to conduct any activity which may result in any discharge.

The term “discharge” is defined in Clean Water Act, Subsections 502(16), 502(12), and 502(6).

Examples of “discharge” include, but are not limited to, allowing the following pollutants to enter WOTUS from the surface, or in-water: solid waste, rock/sand/dirt, heat, sewage, construction debris, any underwater work, chemicals, fugitive dust/spray paint, agricultural wastes, biological materials, industrial wastes, concrete/sealant/epoxy, and washing/cleaning effluent.

Determine if your project/activity requires a federal permit, license, certificate, approval, registration, or statutory exemption by contacting the appropriate federal agencies (e.g. Department of the Army (DA), U.S. Army Corps of Engineers (COE), Pacific Ocean Division Honolulu District Office (POH) Tel: (808) 835-4303; U.S. Environmental Protection Agency, Region 9 Tel: (415) 947-8021; Federal Energy Regulatory Commission Tel: (866) 208-3372; U.S. Coast Guard Office of Bridge Programs Tel: (202) 372-1511). If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the COE-POH regarding their DA permitting requirements.

To request an individual Section 401 WQC, you must complete and submit the Section 401 WQC application together with $1,000 filing fee made payable to the "State of Hawaii" in the form of a check or other method specified by the department. This application is available on the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/.

The processing of a Section 401 WQC application will begin after the CWB has received filing fee. The processing of a Section 401 WQC application is also subject to the compliance with 40 CFR §121 requirements.

Beginning January 31, 2023, the DOH-CWB will only utilize electronic signature e-Permitting forms and discontinue the hard-copy signature forms. All hard-copy signature certification e-Permitting forms, including compliance forms, will be inactivated.

The electronic signature forms will require electronic signature approval to submit a form to the CWB. For details on how to obtain the electronic signature approval please visit CWB website located at: https://health.hawaii.gov/cwb/announcements/cwb-announces-new-requirement-for-electronic-signature-approval-for-all-submissions-beginning-january-31-2023/.

Please see HAR, Chapters 11-53 and 11-54 for the State's Water Quality Standards and for more information on the Section 401 WQC. HAR, Chapters 11-53 and 11-54 are available on the CWB website at: http://health.hawaii.gov/cwb/.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapters 11-53 and 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation and up to two (2) years in jail.

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:

   a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

   b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g. minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

   c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.

Please see HAR, Chapters 11-53 and 11-54 for the State's Water Quality Standards and for more information on the Section 401 WQC. HAR, Chapters 11-53 and 11-54 are available on the CWB website at: http://health.hawaii.gov/cwb/.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapters 11-53 and 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation and up to two (2) years in jail.

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:

   a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

   b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g. minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

   c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.

Standard Comments for Land Use Reviews
Clean Air Branch
Hawaii State Department of Health
October 14, 2022

All project activities shall comply with Hawaii Administrative Rules (HAR), Chapter 11-59 and 11-60.1.

If your proposed project:

Requires an Air Pollution Control Permit

- You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.
- Permit application forms can be found here: https://health.hawaii.gov/cab/permit-application- forms/

Has the potential to generate fugitive dust

- You must reasonably control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near existing residences, businesses, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.
- Construction activities must comply with the provisions of Hawaii Administrative Rules, §11- 60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, it is strongly recommended that buffer zones be established, wherever possible, in order to alleviate potential dust concerns.
- You must provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:
    - Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
    - Providing an adequate water source at the site prior to start-up of construction activities;
    - Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
    - Minimizing airborne, visible fugitive dust from shoulders and access roads;
    - Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
    - Controlling airborne, visible fugitive dust from debris being hauled away from the project site.
- If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch.

Includes construction, demolition, or renovation activities that involve potential asbestos and lead containing materials

- Please contact the Indoor and Radiological Health Branch at (808) 586-4700 or visit: https://health.hawaii.gov/irhb/

Increases the population and potential number of vehicles in an area

- The creation of apartment buildings, complexes, and residential communities may increase the overall population in an area. Increasing the population in an area may inadvertently lead to more air pollution via vehicle exhaust. Vehicle exhaust releases pollutants in the air that can negatively impact human health and air quality, including lung irritants, carcinogens, and greenhouse gases.
- Ensure that drivers keep vehicle idling times to three (3) minutes or less.
- Consider and incorporate support for alternative transportation options such as bike racks and/or electric vehicle charging stations where possible.

If you have any questions, please contact the Clean Air Branch at (808) 586-4200 or at cab@doh.hawaii.gov.

JOSH GREEN, M.D.
GOVERNOR

CATHY IKEDA
CHAIRPERSON

STATE OF HAWAII
STATE PUBLIC CHARTER SCHOOL COMMISSION
('AHA KULA HO'ĀMANA)
http://CharterCommission.Hawaii.Gov
1164 Bishop Street, Suite 1100, Honolulu, Hawaii 96813
Tel: (808) 586-3775 Fax: (808) 586-3776

May 31, 2023

VIA E-MAIL: Tricia@tridason.com

Tricia W. Dang
Tridason LLC
P.O. Box 1361
Honolulu, HI 96807

Re: Environmental Assessment: Pre-assessment Consultation Process

To Whom It May Concern:

The State Public Charter School Commission (Commission), the sole state charter school authorizer in the State of Hawaii, offers the following comments on the proposed project/action for Hui Mālama O Ke Kai Foundation (HMK) and Mālama Honua Public Charter School:

The Commission supports this action to provide permanent facilities that would allow the school to expand and provide its academic mission and vision to the immediate Waimanalo community, as well as the general public at large. The Commission, this past January 2023, approved the school for a new five-year charter school contract, effective July 1, 2023. Five year contracts are the maximum term contracts provided by the Commission; the school's renewal demonstrates the Commission's support and recognition of the academic model and benefit to the community that Mālama Honua Public Charter School provides.

The Commission does not have the expertise and jurisdiction to provide comments regarding the environmental or economic impacts associated with this project. Please contact the Commission should further information or discussion on this be needed.

Mahalo,

Patrick J. Foehr
Interim Executive Director

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

HAKU MILLES, P.E.
DIRECTOR

BRYAN GALLAGHER, P.E.
DEPUTY DIRECTOR

May 10, 2023

SENT VIA EMAIL

Ms. Tricia W. Dang
tricia@tridason.com

Dear Ms. Dang:

Subject: Pre-Consultation Request for Comments - Draft EA for Malama Honua PCS & Hui Malama o ke Kai Improvement Plan

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 questions, please contact me at (808) 768-8480.

Sincerely,

Bryan Gallagher
FOR Haku Milles, P.E., LEED AP
Director

HM:krn (901688)

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

WARREN K. MAMIZUKA
ACTING DIRECTOR

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

IN REPLY REFER TO:
DRM 23-292

June 1, 2023

SENT VIA EMAIL

Ms. Tricia W. Dang
Tricia@tridason.com

Dear Ms. Dang:

Thank you for your email to Acting Director Warren Mamizuka on May 17, 2023, regarding the Draft Environmental Assessment (EA) for Hui Malama O Ke Kai Foundation and the Malama Honua Public Charter School Foundation.

We have no comments at this time, as we do not have any facilities or easements on the subject property.

If you have any questions, please call Mr. Kyle Oyasato of the Division of Road Maintenance at (808) 768-3697.

Sincerely,

Digitally signed by
Mamizuka, Warren K
Date: 2023.06.01
06:01:06 -10'00'

Warren K. Mamizuka
Acting Director

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
711 KAPIOLANI BOULEVARD, SUITE 1600
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

RICK BLANGIARDI
MAYOR

J. ROGER MORTON
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

5/23-903171

May 30, 2023

SENT VIA EMAIL

Tricia W. Dang, Project Manager
Tridason Consulting
Tricia@tridason.com

Dear Ms. Dang:

SUBJECT: Malama Honua Public Charter School Relocation and Expansion
Pre-Consultation for a Draft Environmental Assessment
41-477 Hihimanu Street, Waimanalo, Oahu;
Tax Map Key: 4-1-009: 265

Thank you for the opportunity to provide written comments regarding the Malama Honua Public Charter School Relocation and Expansion Pre-Consultation for a Draft Environmental Assessment; 41-477 Hihimanu Street, Waimanalo, Oahu; Tax Map Key: 4-1-009: 265. We have the following comments.

1. Transportation Assessment Report (TAR). The applicant shall review post-COVID counts in the area and revise the TAR if the post-COVID conditions materially affect the results of the TAR. The TAR shall be revised to assess the new project site location by examining the vehicle, pedestrian, bicycle, and public transit safety, stress, and comfort levels at the nearby intersections and driveways with corresponding improvements to mitigate these impacts by applying Complete Streets principles. The applicant shall discuss the future year growth rate, trip distribution, mode split, and route assignment assumptions used in the TAR.

   The applicant shall submit all native files (e.g., Synchro, Excel, etc.) for the raw multi-modal counts (in the format specified at https://geocounts.com/api/format/ and the example file at https://bit.ly/DTS-count-sample) and accompanying analyses to the Department of Transportation Services Regional Planning Branch (RPB) at

dtsplanningdiv@honolulu.gov. Please refer to the Department of Transportation Services (DTS) Transportation Impact Assessment (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. Transportation Demand Management (TDM) Strategies. The applicant must develop and submit a TDM Strategy to the DTS, incorporating the following elements:

    i. Page 19 of the City's TIA Guide requires sponsors of projects that generate 100 or more net new a.m. or p.m. peak period vehicle trips and contain ongoing operational strategies to submit an annual TDM compliance report for the first five years following completion of the project (or completion of each phase for phased projects) for review and approval by the City and County of Honolulu. The annual report should document the status and effectiveness of the transportation improvements including the actual vehicle trip reduction.

    ii. Pages 20-22 of the City's TIA Guide describes recommended TDM strategies, including, but not limited to: providing subsidized transit passes to students and employees; informing parents and staff of vanpool and car share programs to promote alternate modes of transportation.

3. Pedestrian Improvements.

    i. Sidewalks. The Applicant shall modify the sidewalk on the Project's Hihimanu Street frontage to be consistent with the proposed walkway project (Project ID #2-28 in the 2022 Oahu Pedestrian Plan). All internal Project sidewalks/pedestrian paths and those fronting the Project site shall have a minimum of 5-foot, 8-foot preferred, pedestrian clear zone separate from the furniture and utility zone. Sidewalks shall incorporate the standards of the Honolulu Complete Streets Design Manual, including the placement of street furniture such as landscaping, signage, and lighting, which is intended to provide added protection for pedestrians. New sidewalks, curb ramps, curbs, and gutters must meet current Americans with Disabilities Act standards.

    ii. Installation of lighting; pedestrian-oriented green infrastructure, trees, or other greening landscape consistent with the Complete Streets

furniture zone; and trash receptacles per the Honolulu Complete Streets Design Manual, Oahu Pedestrian Plan, and any applicable streetscape plan.

iii. The developer may construct Complete Streets improvements as recommended by the TAR or make a financial contribution equal to the cost on construction in lieu of such.

4. Bicycle Improvements.

   i. Refer to the Right-of-Way Widths for Planned Street Improvements Plan and map for data on street types including future bicycle, pedestrian, and transit priority configurations at: https://www.honolulu.gov/completestreets/guidance.html.

   ii. Hihimanu Street fronting the project site is classified as a "Street" planned to have sidewalks, shared roadways, two travel lanes, and no on-street parking. The typical future street cross section will resemble in concept the first design on Page 78 of the City's Complete Streets Design Manual. Additionally, a Priority 2 Shared Roadway project (Project ID 2-68 in the 2019 Oahu Bike Plan) is located on Hihimanu Street fronting the project site. Any driveways or improvements shall be designed to minimize the number and size of potential conflict areas between bicyclists and turning vehicles.

5. Parking. A discussion regarding off-street parking and site generated parking demand should be added to the TAR.

6. Street Usage Permit. A street usage permit from the DTS should be obtained for any construction-related work that may require the temporary closure of any traffic lane, sidewalk, bicycle lane, or pedestrian mall on a City street.

7. Neighborhood Impacts. The area representatives, neighborhood board, as well as the area guests, 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.

8. 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 requirements.

Should you have any questions, please contact Greg Tsugawa, of my staff, at (808) 768-6683.

Very truly yours,

J. Roger Morton
Director

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

SHELDON K. HAO
FIRE CHIEF

JASON SAMALA
DEPUTY FIRE CHIEF

May 11, 2023

SENT VIA E-MAIL

Ms. Tricia Dang
Tricia@triadson.com

Dear Ms. Dang:

Subject: Draft Environmental Assessment
Malama Honua Public Charter School Foundation and Hui Malama Honua O Ke Kai Improvement Plan
41-477 Hihimanu Street
Waimanalo, Hawaii 96795
Tax Map Key: 4-1-009: 265

In response to your email received on May 4, 2023, regarding the abovementioned subject, the Honolulu Fire Department (HFD) reviewed the submitted information and requires 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; 2018 Edition, Sections 18.2.3.2.2 and 18.2.3.2.2.1, as amended.)

   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; 2018 Edition, Section 18.2.3.2.1.)

2. Fire department access roads shall be in accordance with NFPA 1; 2018 Edition, Section 18.2.3.

3. An approved water supply capable of supplying the required fire flow for fire protection shall be provided to all premises upon which facilities, buildings, or portions of buildings are hereafter constructed or moved into the jurisdiction. The approved water supply shall be in accordance with NFPA 1; 2018 Edition, Sections 18.3 and 18.4.

4. Submit civil drawings to the City and County of Honolulu's Department of Planning and Permitting and route them to the HFD for review and approval.

The abovementioned provisions are required by the HFD. This project may necessitate that additional requirements be met as determined by other agencies.

Should you have questions, please contact Acting Battalion Chief Kendall Ching of our Fire Prevention Bureau at 808-723-7154 or kching3@honolulu.gov.

Sincerely,

CRAIG UCHIMURA
Acting Assistant Chief

CU/MD: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

ARTHUR J. LOGAN
CHIEF

KEITH K. HORIKAWA
RADE K. VANIC
DEPUTY CHIEFS

OUR REFERENCE GH-DNK

May 10, 2023

SENT VIA EMAIL

Ms. Tricia W. Dang
tricia@tridason.com

Dear Ms. Dang:

This is in response to your e-mail correspondence of May 4, 2023, requesting input on the Environmental Assessment for the proposed Malama Honua Public Charter School project in Waimanalo.

The Honolulu Police Department (HPD) has reviewed the information provided and has some concerns. The HPD recommends that all necessary signs, lights, barricades, and other safety equipment be installed and maintained by the contractor during the construction phase of the project.

The HPD also recommends that adequate notification be made to residents and visitors in the area prior to deliveries or possible road closures, as any impacts to pedestrian and/or vehicular traffic may cause issues and disruptions which could lead to complaints.

If there are any questions, please call Major Herbert Soria of District 4 (Kaneohe, Kailua, Kahuku) at (808) 723-8640.

Sincerely,

GLENN HAYASHI
Assistant Chief of Police
Support Services Bureau

EXHIBIT B - TRAFFIC ANALYSIS IMPACT REPORT

***The following is a Report completed in 2019 for MHPCS relocation to a vacant portion of property 0.4 miles east on Hihimanu Street, and 0.5 miles south on Ahiki Street. The project scope and use of Hihimanu Street remains the same.*

TRANSPORTATION ASSESSMENT REPORT

FOR THE PROPOSED

MALAMA HONUA PUBLIC CHARTER SCHOOL RELOCATION AND EXPANSION

WAIMANALO, OAHU, HAWAII
TAX MAP KEY: 4-1-026:PORTION OF 001

PREPARED FOR

MALAMA HONUA PUBLIC CHARTER SCHOOL

FEBRUARY 8, 2019

PREPARED BY

TMC **THE TRAFFIC MANAGEMENT CONSULTANT**

TRANSPORTATION ASSESSMENT REPORT

FOR THE PROPOSED

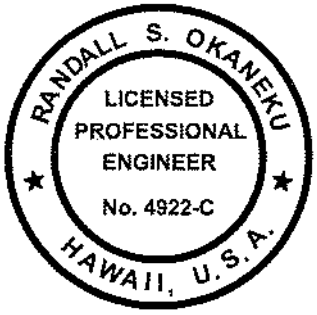
MALAMA HONUA PUBLIC CHARTER SCHOOL RELOCATION AND EXPANSION

WAIMANALO, OAHU, HAWAII
TAX MAP KEY: 4-1-026:PORTION OF 001

PREPARED FOR

MALAMA HONUA PUBLIC CHARTER SCHOOL

FEBRUARY 8, 2019



PREPARED BY

THE TRAFFIC MANAGEMENT CONSULTANT
RANDALL S. OKANEKU, P.E., PRINCIPAL * 1188 BISHOP STREET, SUITE 1907 * HONOLULU, HI 96813

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TRANSPORTATION ASSESSMENT REPORT

FOR THE PROPOSED

MALAMA HONUA PUBLIC CHARTER SCHOOL RELOCATION AND EXPANSION

WAIMANALO, OAHU, HAWAII
TAX MAP KEY: 4-1-026:PORTION OF 001

I. Introduction

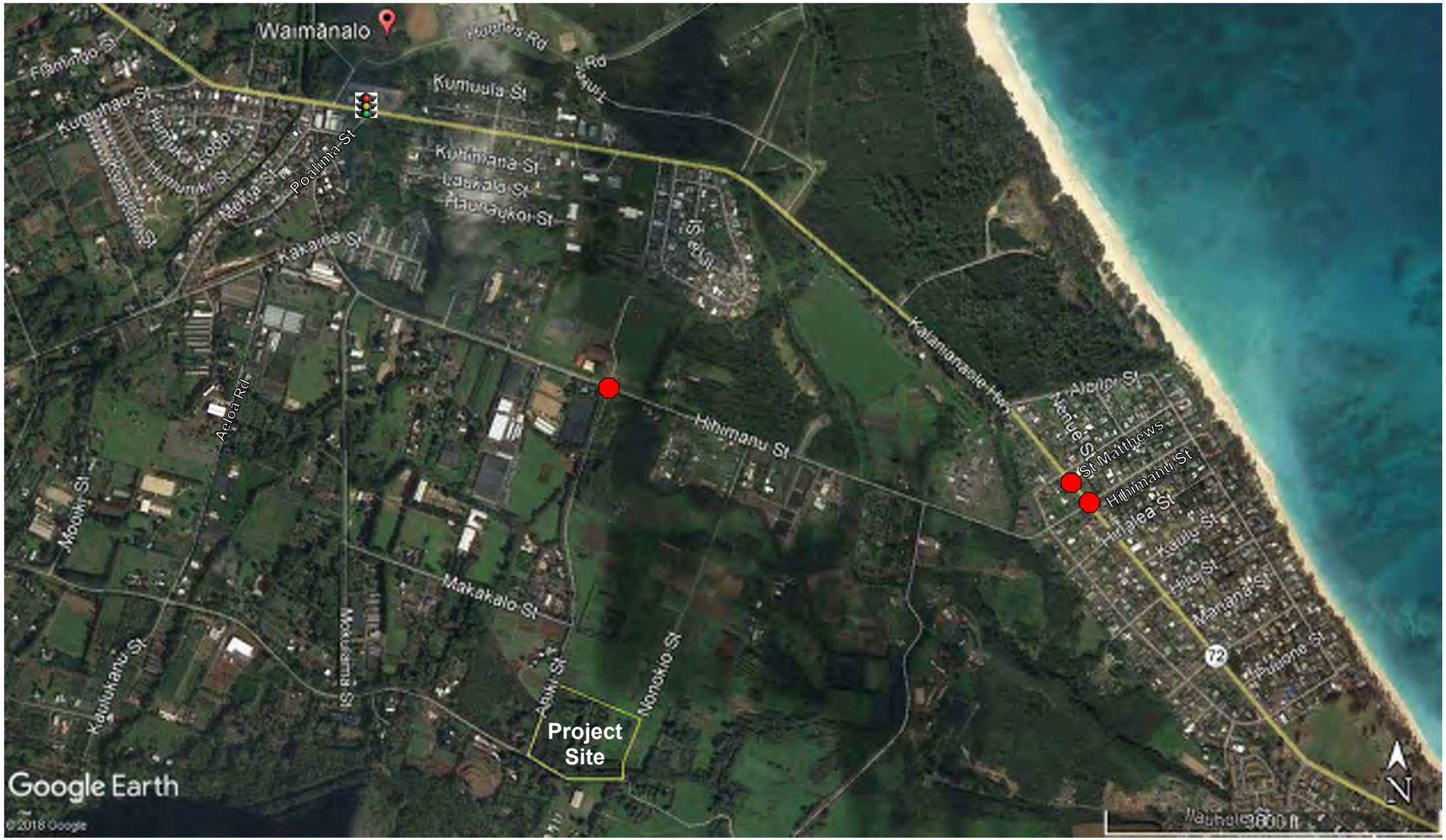
A. Project Description

The existing Malama Honua Public Charter School (MHPCS) is located at St. Matthew's Episcopal Church at 41-054 Ehukai Street in Waimanalo, Oahu, Hawaii. Access to the existing MHPCS is located on the east side of Kalanianaole Highway, immediately south of Ehukai Street. The existing kindergarten to 6th grade (K-6) MHPCS enrollment is 126 students.

The Malama Honua Public Charter School Foundation proposes to relocate its charter school to a portion of the site known as College of Tropical Agriculture and Human Resources in Waimanalo. The project site is identified as Tax Map Key: 4-1-026: portion of 001. The site is located between Ahiki Street and the future extension of Nonokio Street, and north of Waikupanaha Street. Figure 1 depicts the location map and the study area.

Access to the proposed MHPCS site will be provided on Ahiki Street. An internal roadway will be constructed along the north boundary of the project site between Ahiki Street and the future extension of Nonokio Street. A curbside drop-off/pick-up and turnaround area will be constructed on a separate roadway, fronting the administration building. The MHPCS site plan is depicted on Figure 2.

The proposed MHPCS will expand its classes through a phased approach, which will include a preschool, and kindergarten through 12th grade. Class times for the proposed MHPCS will be from 7:45 AM to 2:45 PM, Monday through Friday. The earliest drop-off time at MHPCS will be 7:00 AM. The latest pick-up time will be 5:30 PM.



Study Intersections

Figure 1. Location Map and Study Area

Figure 2. MHCPS Site Plan

The proposed MHPCS relocation and expansion will be developed in two (2) phases. The first phase is expected to open in the Fall of 2020 with grades kindergarten (K) through 8th grade. The second phase will include the preschool and Grades 9 through 12 in the Year 2025. The existing MHPCS is expected to close its facility at the St. Matthew's Episcopal Church upon completion of the proposed school. Table 1 summarizes the enrollment for the proposed Malama Honua Public Charter School.

Table 1. Malama Honua Public Charter School Enrollment

Grades	Students
Preschool	20
K - 6th	140
7th - 8th	40
9th - 12th	80
Total	**280**

B. Purpose and Scope of the Study

The purpose of this study is to analyze the transportation impacts resulting from the development of the proposed relocation of the Malama Honua Public Charter School. This report presents the methodologies, findings, and recommendations of the study. The scope of this study includes:

1. Description of the proposed project.
2. Evaluation of existing roadways and traffic conditions.
3. Analysis of future traffic conditions without the proposed project.
4. Identification and analysis of the transportation impacts resulting from the development of the proposed MHPCS relocation and expansion project.
5. Recommendations of improvements, as necessary, which would mitigate the transportation impacts identified in this study.

C. Methodologies

1. Capacity Analysis Methodology

The highway capacity analysis, performed in this study, 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 six (6) Levels of Service from the traveler's perspective, ranging from the best LOS "A" to the worst LOS "F". LOS translates the complex mathematical results of the highway capacity analysis into an A through F grading system to simplify the roadway performance for non-technical decision-makers.

LOS's "A", "B", and "C" are considered satisfactory Levels of Service. LOS "D" is generally considered a "desirable minimum" operating Level of Service. LOS's "E" and "F" are undesirable conditions.

Intersection LOS is primarily based upon the average delay (d) in seconds per vehicle (sec/veh). The LOS delays at unsignalized intersections, which include stop-controlled intersections and roundabouts, are generally shorter than signalized intersections, due to the drivers' expectation and acceptance of longer delays at higher-volume signalized intersections.

Table 2. Intersection Level of Service Criteria (HCM)

LOS	Signalized Control	Unsignalized Control	Description
	Delay d (sec/veh)		
A	d≤10	d≤10	Control delay is minimal.
B	10<d ≤20	10<d≤15	Control delay is not significant.
C	20<d≤35	15<d≤25	Stable operation. Queuing begins to occur.
D	35<d≤55	25<d≤35	Less stable condition. Increase in delays, decrease in travel speeds.
E	55<d≤80	35<d≤50	Unstable operation, significant delays.
F	d>80	d>50	High delays, extensive queuing.

HCM utilizes a peak hour factor (PHF), which converts the 15-minute peak traffic volume into a peak hour volume. For the purpose of this study, the peak hour traffic analysis is based directly upon the peak 15-minute traffic flows entering the study intersection, which is multiplied by four (4) to convert the 15-minute peak volumes into peak hour volumes.

Synchro is a traffic analysis software that was developed by Trafficware. Synchro is an intersection analysis program that is based upon the HCM methodology. Synchro was used to calculate the Levels of Service for the intersections in the study area. Worksheets for the capacity analysis, performed throughout this report, are compiled in the Appendix.

2. Trip Generation Methodology

The trip generation methodology is based upon generally accepted techniques that were developed by the Institute of Transportation Engineers (ITE) and published in Trip Generation, 10th Edition. The ITE trip rates were developed by correlating the

total vehicle trip generation data with various activity/land use characteristics, such as the vehicle trips per hour (vph) per student. The ITE fitted curve equations were used to estimate the trip generation, except when the number of students is not within the range of data collected by ITE, or when a fitted curve equation was not developed. Otherwise, the average trip rates were used.

3. Pedestrian, Bicycle, and Transit Methodologies

The field investigation indicated that the pedestrian and bicycle traffic in the study area were minimal. The MHCPS students and staff are not expected to significantly impact TheBus usage. Therefore, this Transportation Assessment Report does not include a multi-modal capacity analysis.

II. Existing Conditions

A. Roadways

Kalanianaole Highway is a two-lane, two-way arterial highway, which provides access through Waimanalo. In the vicinity of Hihimanu Street, a paved sidewalk is located on the west side of Kalanianaole Highway, and a grassed shoulder is located on the east side of the Highway. At Poalima Street, a paved sidewalk is located on the south side of Kalanianaole Highway, and a paved shoulder is located on the north side of the Highway. The posted speed on Kalanianaole Highway varies between 25 miles per hour (mph) and 35 mph. Kalanianaole Highway carries about 18,000 vehicles per day, total for both directions.

Hihimanu Street is a collector street in Waimanalo. Hihimanu Street intersects Kalanianaole Highway at a stop-controlled, four-legged intersection. Hihimanu Street is about 20 feet wide, without sidewalks, between Kalanianaole Highway and Ahiki Street. Hihimanu Street reduces to a one-lane culvert crossing between Nonokio Street and Waikupanaha Street. West of Ahiki Street, Hihimanu Street is about 22 feet wide, with a sidewalk on the north side of the roadway. The posted speed on Hihimanu Street is 25 mph. Hihimanu Street continues as Poalima Street to Kalanianaole Highway.

Poalima Street is a two-way, two-lane roadway, which intersects Kalanianaole Highway at a four-legged, signalized intersection.

Ahiki Street is a two-way, two-lane local street between Hihimanu Street and Waikupanaha Street. Ahiki Street intersects Hihimanu Street at a stop-controlled intersection, opposite the Albert H. Azevedo Field (Waimanalo District Park) driveway. Ahiki Street is about 18 feet wide, with unpaved shoulders on both sides of the roadway. Nonokio Street is a cul-de-sac street off Hihimanu Street and does not extend to the project site.

B. Public Transit

TheBus Routes 57 and 77 provide transit service to Waimanalo. TheBus stops are located on Kalanianaole Highway, one block away from Hihimanu Street: at Ehukai Street (northbound), fronting St. Matthew's Episcopal Church, and at Hinalea Street (southbound). TheBus stops are located on both sides of Kalanianaole Highway, west of Poalima Street. Both TheBus stops are located about one mile from the proposed project site on Ahiki Street.

C. Existing Peak Hour Traffic Volumes and Operating Conditions

1. Field Investigation and Data Collection

Turning movement traffic count surveys were conducted, during the week of September 24, 2018, during the weekday AM, mid-afternoon, and PM peak periods of traffic, at the following intersection:

- Kalanianaole Highway and Hihimanu Street
- Kalanianaole Highway and Poalima Street
- Hihimanu Street and Ahiki Street
- Kalanianaole Highway and St. Matthew's Episcopal Church

The traffic count surveys included pedestrian traffic crossing the roadways, and bicycle traffic. The traffic signal timing and phasing were based upon the conditions, which were observed during the field investigation. The HCM LOS calculations were compared with the average vehicle delays, which were observed during the field investigation. The traffic data are presented in the Appendix.

2. Existing AM Peak Hour Traffic

The AM peak hour of traffic occurred between 7:00 AM and 8:00 AM. Kalanianaole Highway carried about 1,500 vehicles per hour (vph), total for both directions at Poalima Street. At Hihimanu Street, Kalanianaole Highway carried about 1,200 vph, total for both directions. Hihimanu Street carried about 300 vph, while Ahiki Street carried about 50 vph, total for both directions. Five (5) bicycles entered the intersection of Kalanianaole Highway and Poalima Street, during the AM peak hour of traffic. Four (4) bicycles passed through the intersection of Hihimanu Street and Ahiki Street. One (1) bicycle on northbound Kalanianaole Highway crossed Hihimanu Street, and one (1) bicycle used the pedestrian path, during the AM peak hour of traffic.

The intersection of Kalanianaole Highway and Poalima Street operated at LOS "B", during the existing AM peak hour of traffic. Poalima Street operated at LOS "F". The

other traffic movements at the intersection operated at satisfactory Levels of Service, i.e., LOS "C" or better.

The intersection of Hihimanu Street and Ahiki Street operated at LOS "A", during the existing AM peak hour of traffic.

During the existing AM peak hour of traffic, eastbound Hihimanu Street operated at LOS "D" at Kalanianaole Highway. However, the observed delays corresponded to LOS "A" conditions. The other traffic movements at the intersection operated at satisfactory Levels of Service.

The St. Matthew's Driveway operated at LOS "C" at Kalanianaole Highway. The other traffic movements at the intersection operated at satisfactory Levels of Service. Figure 3 depicts the existing AM peak hour traffic volumes.

3. Existing Mid-Afternoon Peak Hour Traffic

The mid-afternoon peak hour of traffic, which occurred between 2:15 PM and 3:15 PM, is based upon the peak hour of generator at the existing public charter school at St. Matthew's Episcopal Church. Kalanianaole Highway carried 1,500 vph, total for both directions, west of Poalima Street. Six (6) bicycles crossed the intersection of Kalanianaole Highway and Poalima Street. Hihimanu Street carried about 300 vph at Ahiki Street, while Ahiki Street carried about 60 vph, total for both directions.

During the existing mid-afternoon peak hour of traffic, the intersection of Kalanianaole Highway and Poalima Street operated at LOS "B". Poalima Street operated at LOS "D" at Kalanianaole Highway. The other traffic movements at the intersection operated at satisfactory Levels of Service.

The other study intersections operated at satisfactory Levels of Service. The existing mid-afternoon peak hour traffic volumes are depicted on Figure 4.

4. Existing PM Peak Hour Traffic

The existing PM peak hour of traffic occurred between 3:45 PM and 4:45 PM. Kalanianaole Highway carried between 1,200 vph and 1,500 vph, total for both directions. Kalanianaole Highway carried zero (0) bicycles at Poalima Street and (8) bicycles at Hihimanu Street, during the existing PM peak hour of traffic. Hihimanu Street carried about 300 vph, while Ahiki Street carried about 80 vph, total for both directions. Seven (7) bicycles passed through the intersection of Hihimanu Street and Ahiki Street, during the existing PM peak hour of traffic.

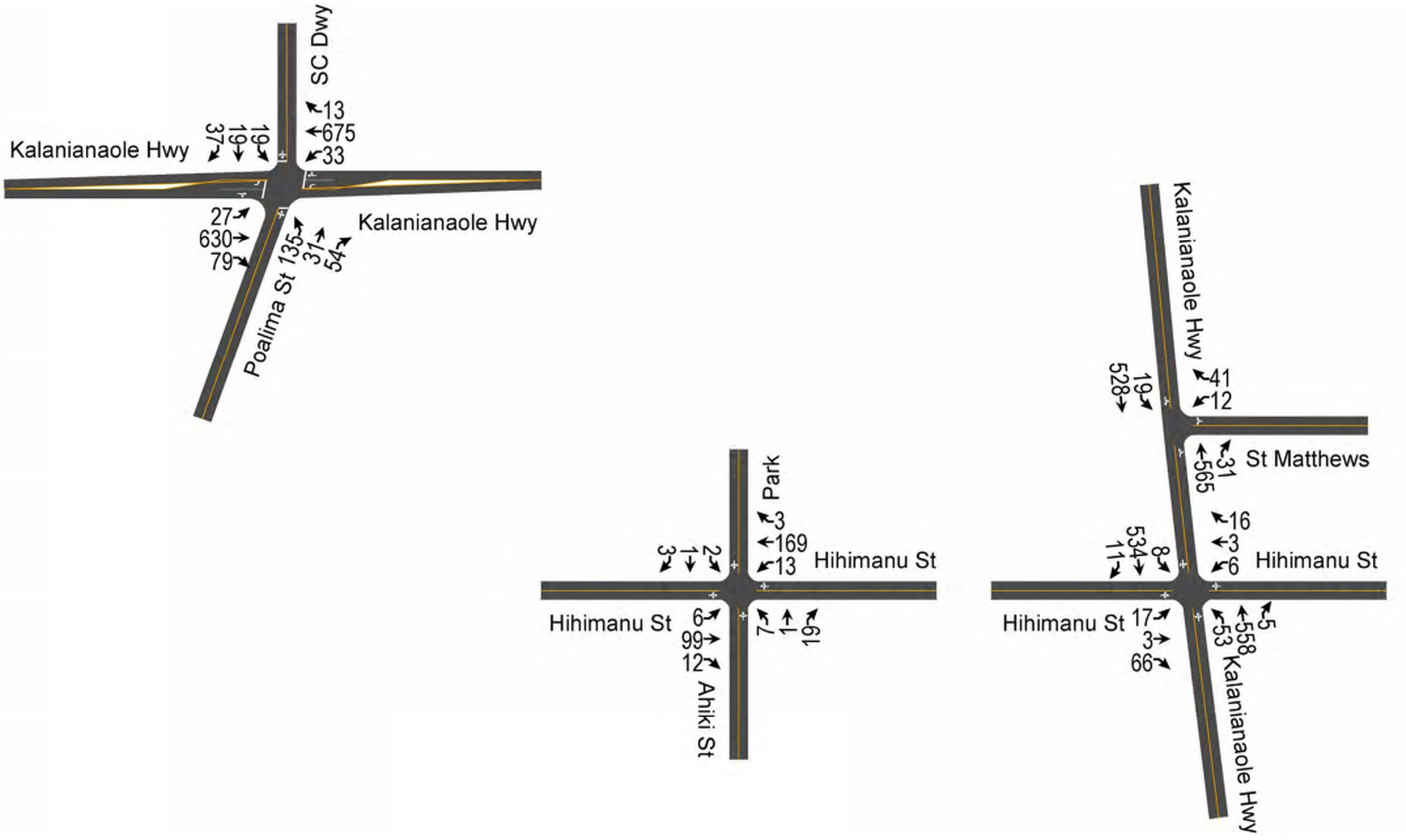


Figure 3. Existing AM Peak Hour Traffic

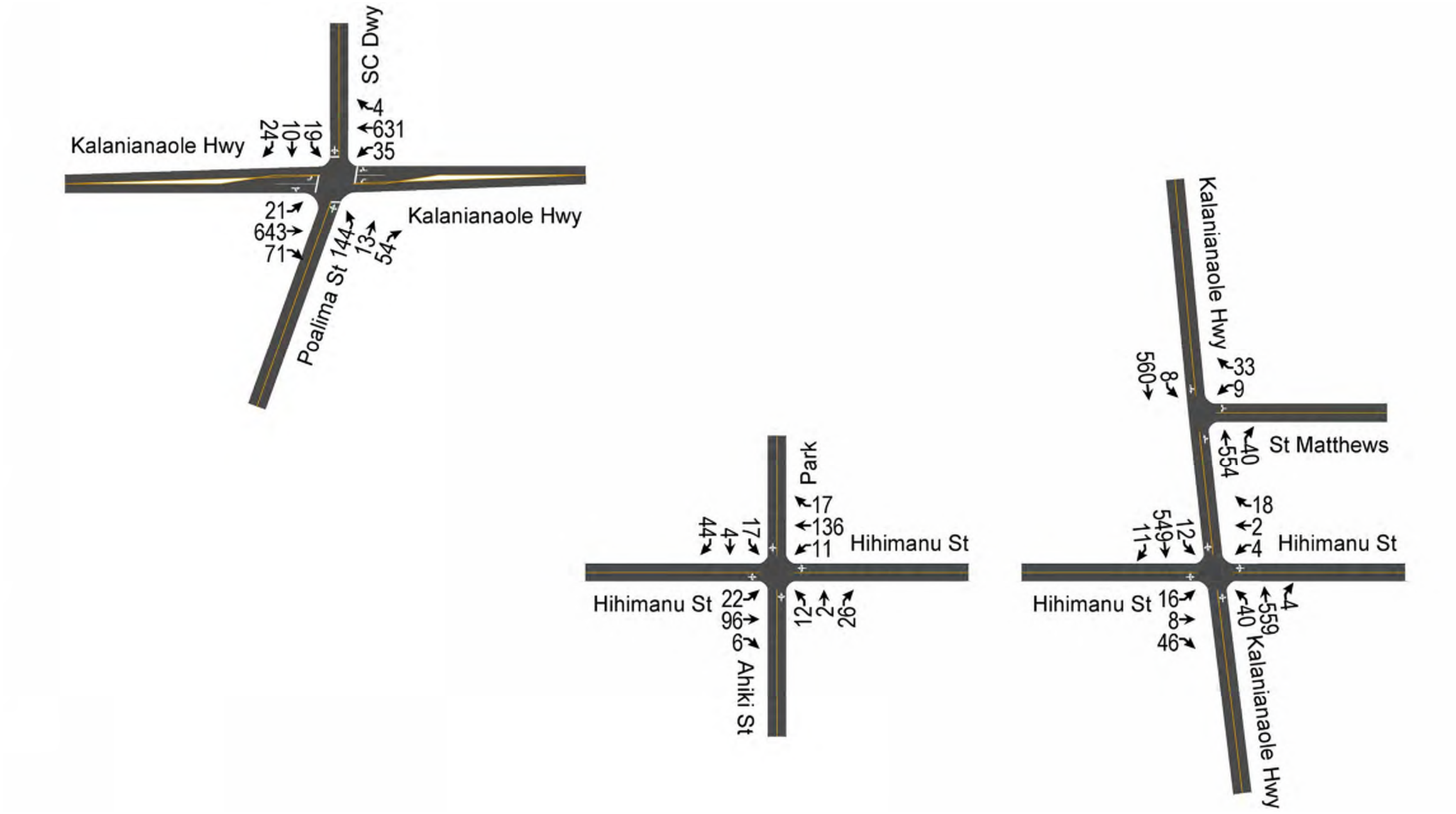


Figure 4. Existing Mid-Afternoon Peak Hour Traffic

The intersection of Kalanianaole Highway and Poalima Street operated at LOS "B", during the existing PM peak hour of traffic. Poalima Street operated at LOS "D". The other traffic movements at the intersection operated at satisfactory Levels of Service.

The other study intersections operated at satisfactory Levels of Service. Figure 5 depicts the existing PM peak hour traffic volumes.

III. Future Traffic Conditions

A. Background Growth in Traffic

The population forecasts for Oahu were published in the Oahu Regional Transportation Plan, by the Oahu Metropolitan Planning Organization. The populations in Waimanalo and Kailua are expected to experience no growth. For the purpose of this transportation assessment, an annual growth rate of 0.5 percent was applied to the existing (2018) traffic demands to estimate the Year 2025 traffic demands without the proposed project.

B. Year 2025 Traffic Analysis Without Project

1. AM Peak Hour Traffic Analysis Without Project

During the Year 2025 AM peak hour of traffic without the proposed project, Poalima Street is expected to continue to operate at LOS "F". The other traffic movements at the intersection are expected to operate at satisfactory Levels of Service.

The other study intersections are expected to operate at the same Levels of Service as during the existing AM peak hour of traffic. Figure 6 depicts the Year 2025 AM peak hour traffic volumes without the proposed project.

2. Mid-Afternoon Peak Hour Traffic Analysis Without Project

During the Year 2025 mid-afternoon peak hour of traffic without the proposed project, the study intersections are expected to continue to operate at the same Levels of Service as during the existing mid-afternoon peak hour of traffic. The Year 2025 mid-afternoon peak hour traffic volumes without the proposed project are depicted on Figure 7.

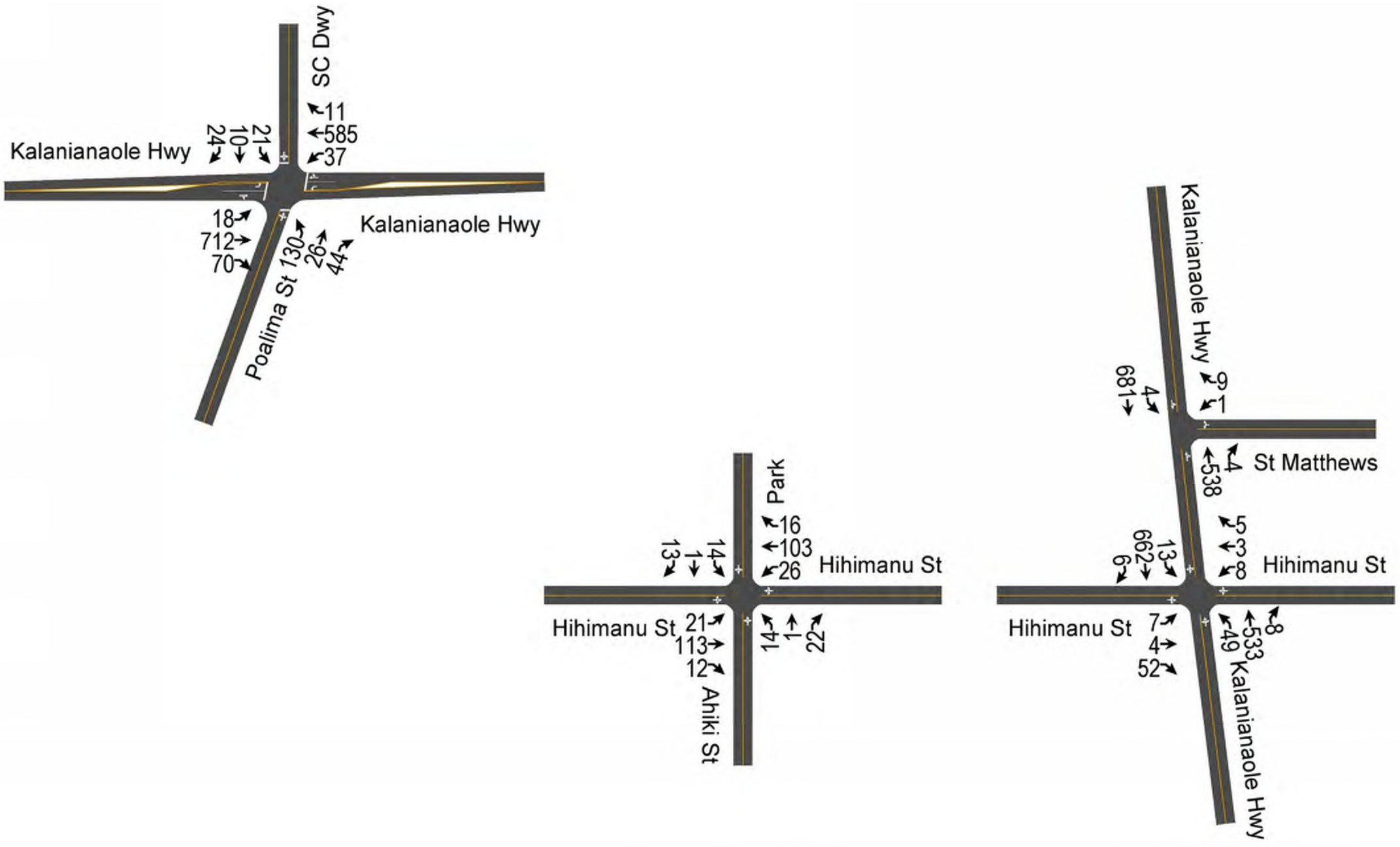


Figure 5. Existing PM Peak Hour Traffic

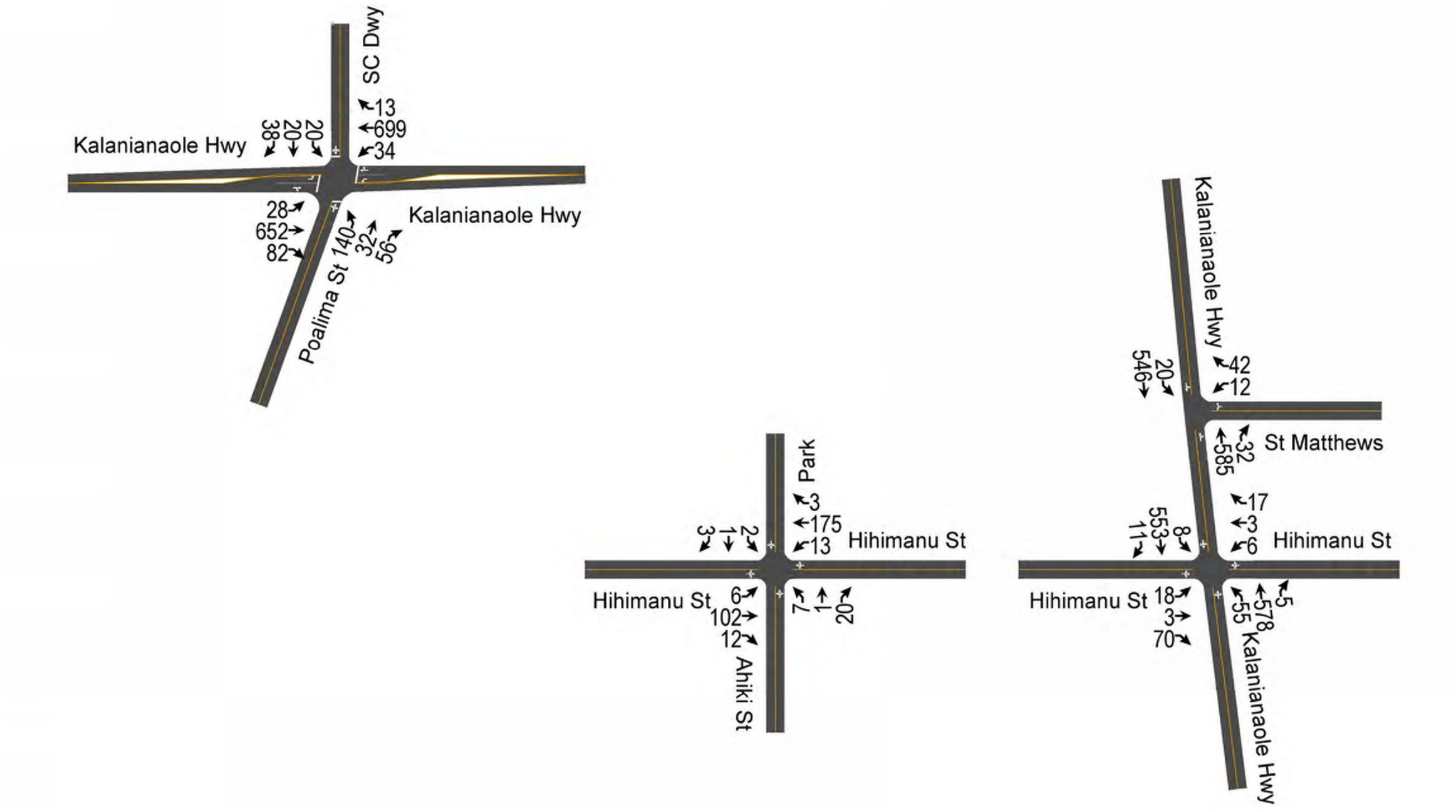


Figure 6. Year 2025 AM Peak Hour Traffic Without Project

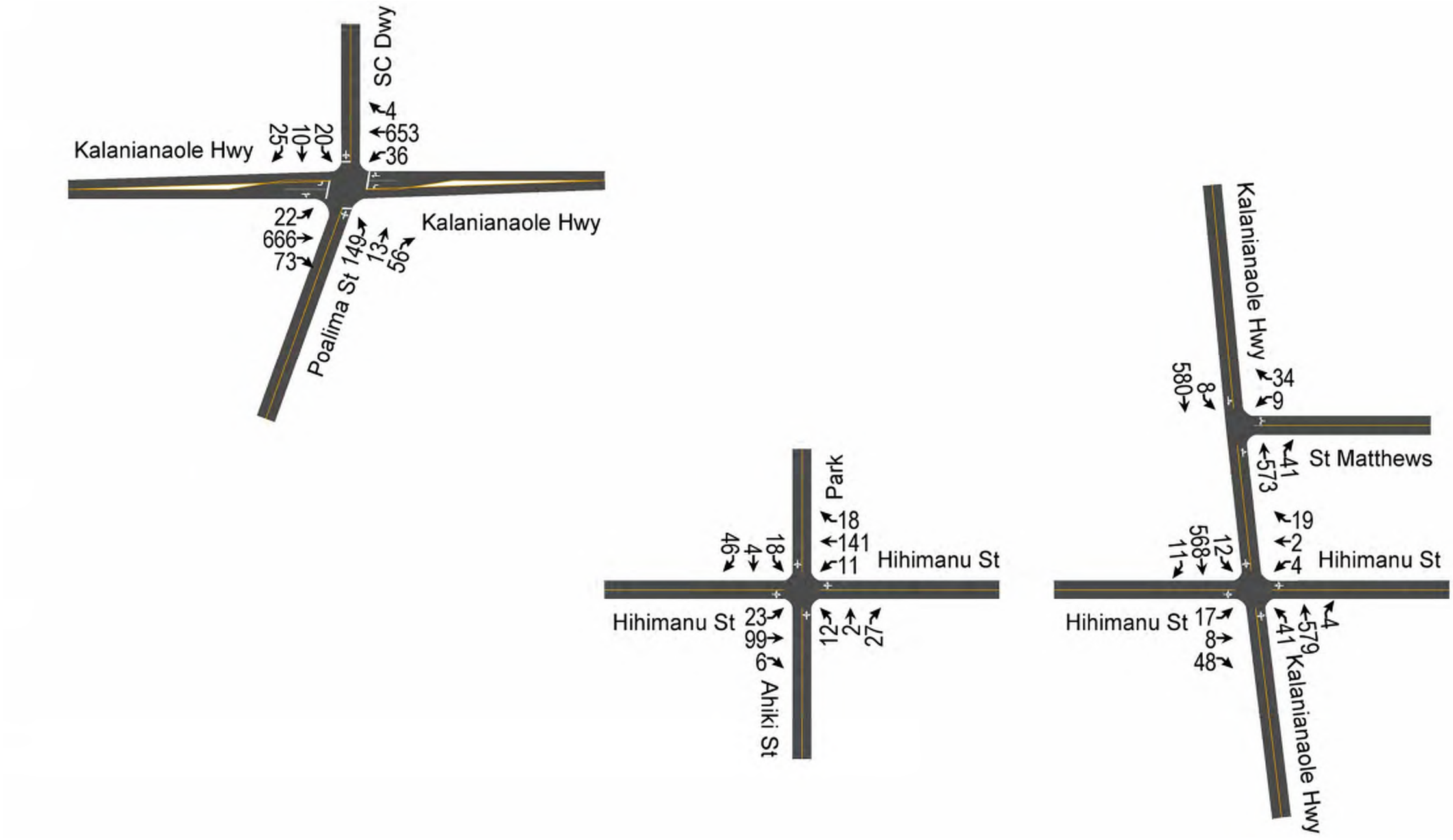


Figure 7. Year 2025 Mid-Afternoon Peak Hour Traffic Without Project

3. PM Peak Hour Traffic Analysis Without Project

During the Year 2025 PM peak hour of traffic without the proposed project, the study intersections are expected to continue to operate at the same Levels of as during the existing PM peak hour of traffic. The Year 2025 PM peak hour traffic volumes without the proposed project and the results of the capacity analysis are depicted on Figure 8.

IV. Transportation Impact Analysis With Project

A. Trip Generation Characteristics

A trip generation study was conducted at the existing Malama Honua Public Charter School over a two-day period. The average trip generation characteristics at the existing MHPCS and the ITE trip generation characteristics (Land Use Code 537) for a 126-student charter elementary school are summarized in Table 3.

Table 3. Existing MHPCS Trip Generation Characteristics

Peak Hour	Direction	ITE	MHPCS	ITE-MHPCS
AM Peak Hour	Enter	60	50	10
	Exit	53	53	0
	Total	113	103	10
Mid-Afternoon Peak Hour	Enter	39	48	-9
	Exit	46	42	4
	Total	85	90	-5
PM Peak Hour	Enter	6	8	-2
	Exit	11	9	2
	Total	17	17	0

The trip generation characteristics for the proposed Malama Honua Public Charter School were based upon the ITE trip rates for a 20-student preschool (daycare center), a 140-student charter elementary school (K-6), and a 120-student private school (7-12). The trip generation characteristics for the proposed MHPCS are summarized in Table 4.

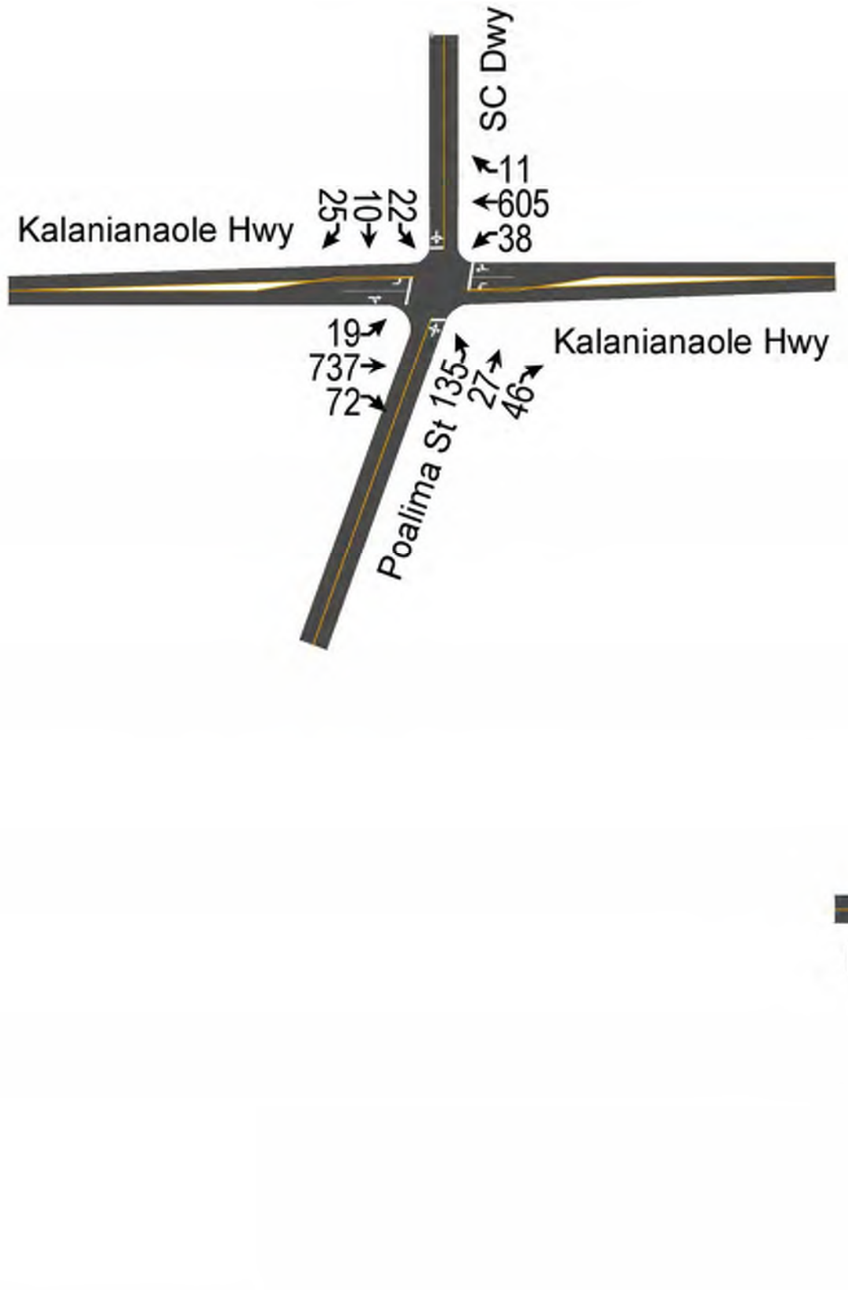


Figure 8. Year 2025 PM Peak Hour Traffic Without Project

Table 4. Trip Generation Characteristics (ITE Land Use Code)					
Peak Hour	**Direction**	**Preschool (565)**	**Charter School (537)**	**Private School (536)**	**Total**
AM Peak Hour	**Enter**	11	68	59	138
	Exit	10	61	37	108
	Total	21	129	96	246
Mid-Afternoon Peak Hour	**Enter**	8	43	29	80
	Exit	9	51	40	100
	Total	17	94	69	180
PM Peak Hour	**Enter**	9	7	9	25
	Exit	10	13	12	35
	Total	19	20	21	60

B. Transportation Impact Analysis With Project

1. Trip Distribution

The traffic assignment is based upon the distribution of the existing MHCPS enrollment, where 66 percent live in Waimanalo, 32 percent live in Kailua and Kaneohe, and 2 percent live in East Honolulu. Discounting the existing MHCPS traffic at St. Matthew's Episcopal Church, Figures 9, 10, and 11 depict the net increases in the AM, mid-afternoon, and PM peak hour site-generated traffic, respectively.

2. AM Peak Hour Transportation Impact Analysis With Project

Ahiki Street is expected to operate at LOS "B" at Hihimanu Street, during the AM peak hour of traffic. Eastbound Hihimanu Street is expected to improve from LOS "D" to LOS "C" with the diversion of school traffic to the proposed site. The other intersections in the study area are expected to continue to operate at the same Levels of Service as during the Year 2025 AM peak hour of traffic without the proposed project. Figure 12 depicts the AM peak hour traffic with the proposed project.

3. Mid-afternoon Peak Hour Transportation Impact Analysis With Project

During the mid-afternoon peak hour of traffic with the proposed project, Poalima Street is expected to operate at LOS "E" at Kalanianaole Highway. The other intersections in the study area are expected to continue to operate at the same Levels of Service as during the Year 2025 mid-afternoon peak hour of traffic without the proposed project. The mid-afternoon peak hour traffic with the proposed project is depicted on Figure 13.

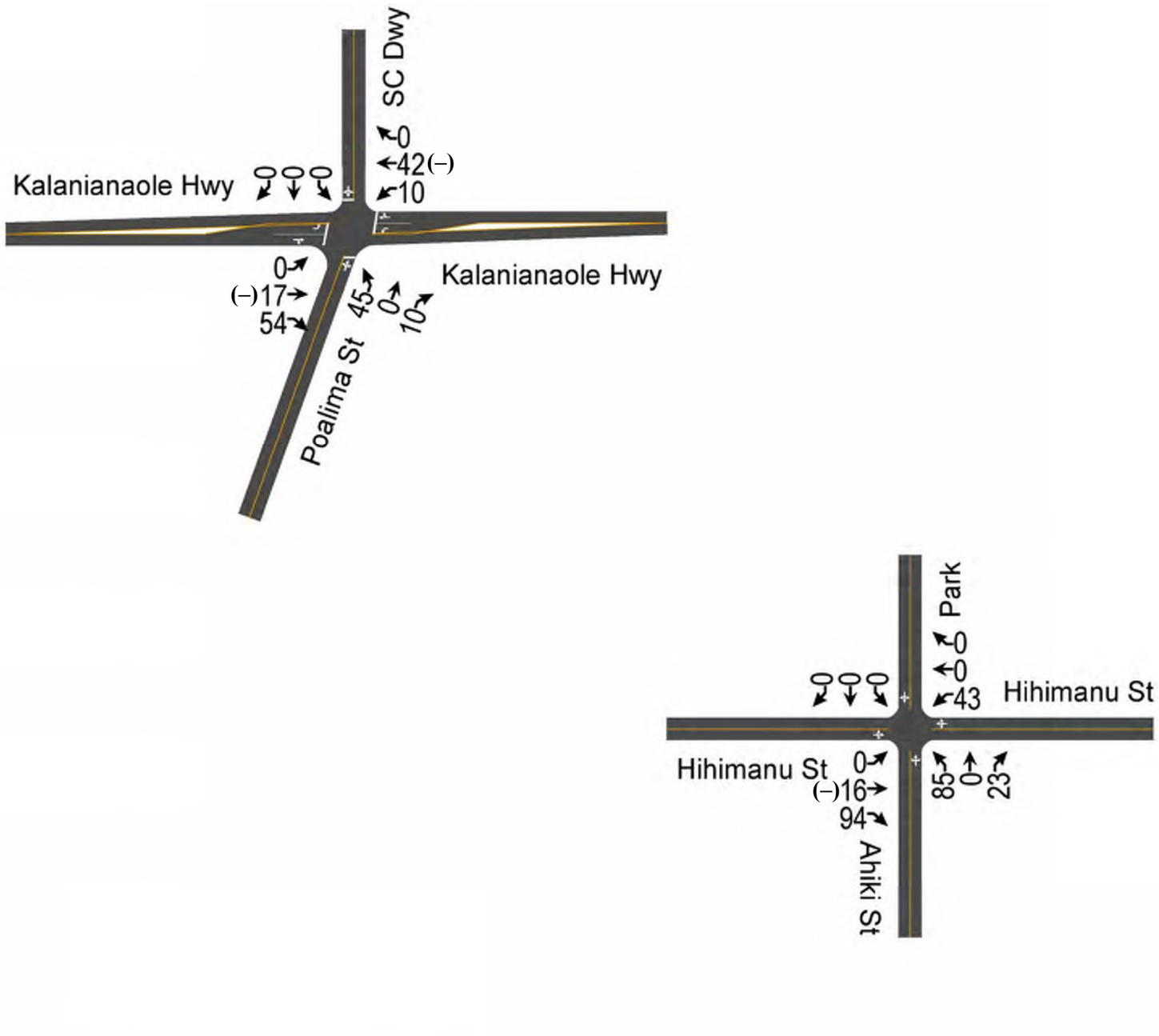


Figure 9. AM Peak Hour Site Traffic

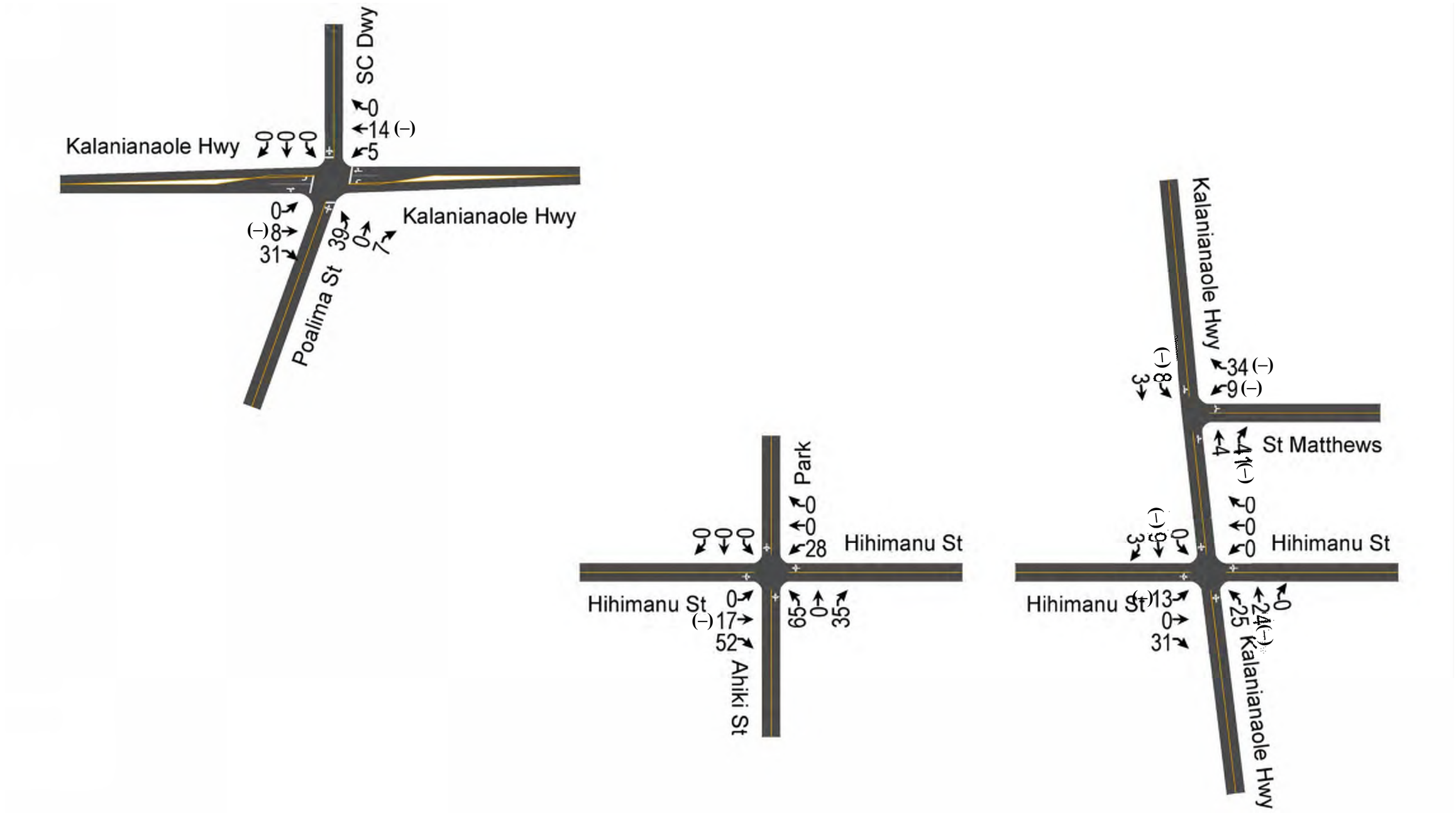


Figure 10. Mid-Afternoon Peak Hour Site Traffic

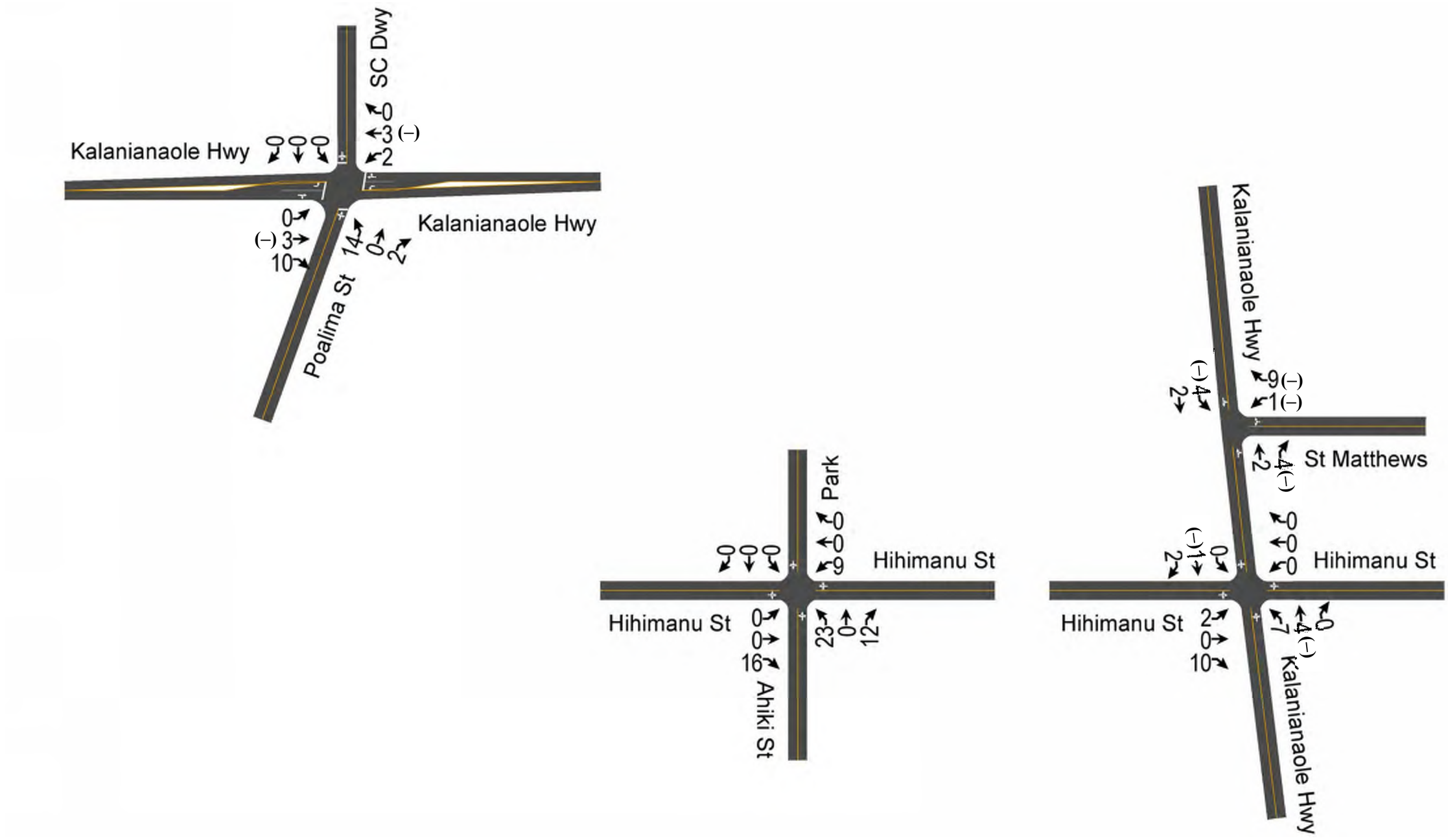


Figure 11. PM Peak Hour Site Traffic

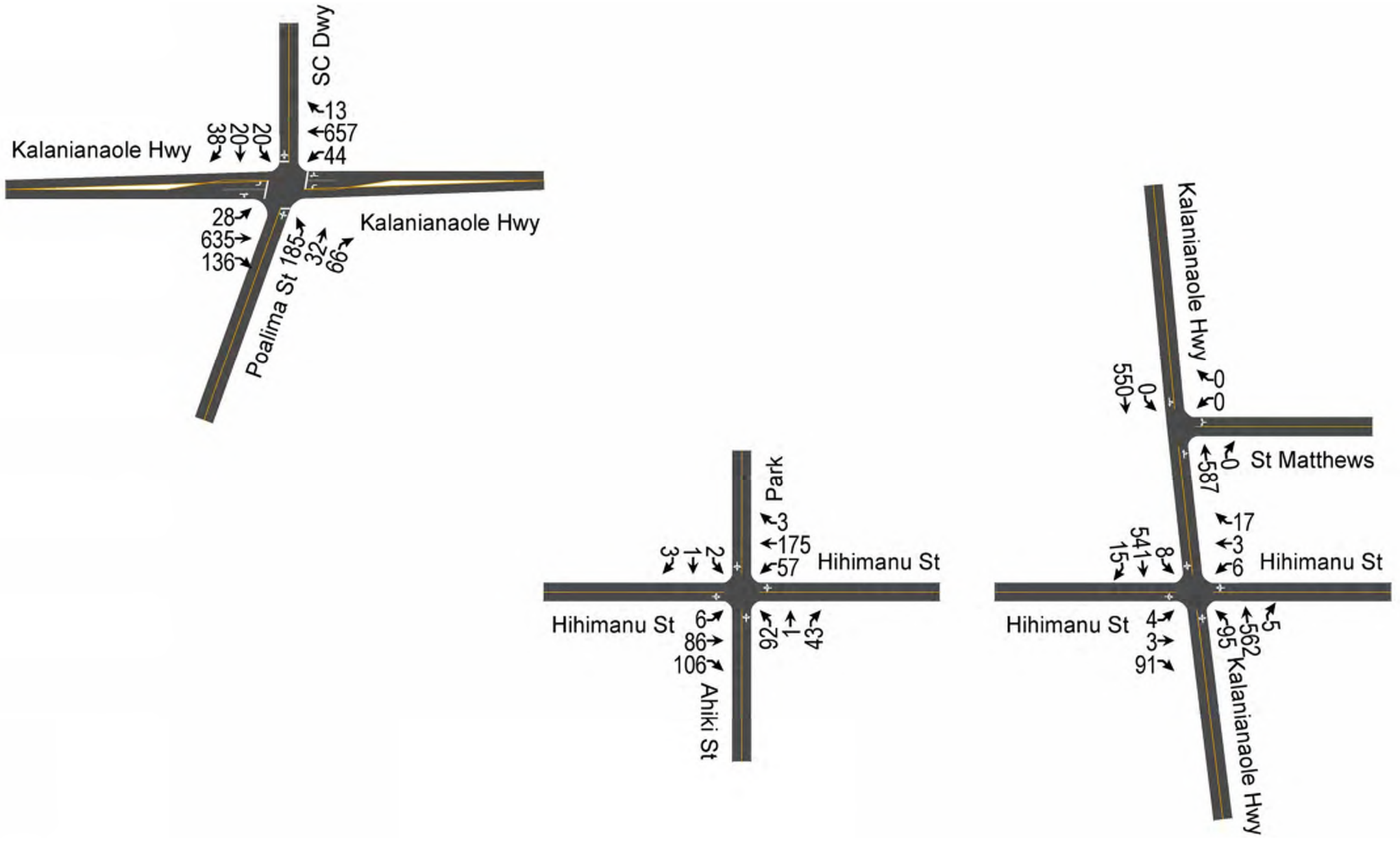


Figure 12. AM Peak Hour Traffic With Project

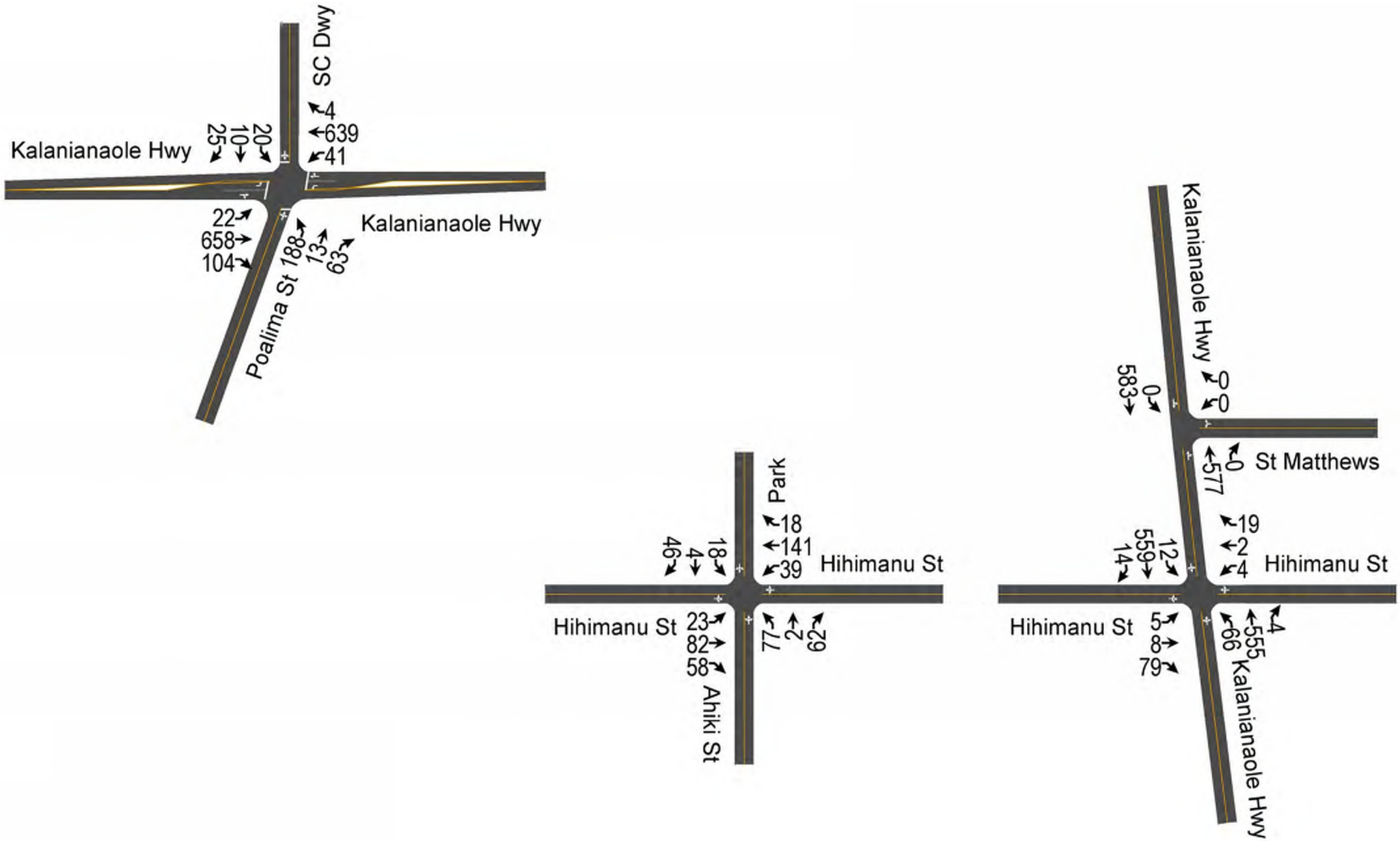


Figure 13. Mid-Afternoon Peak Hour Traffic With Project

4. PM Peak Hour Transportation Impact Analysis With Project

During the PM peak hour of traffic with the proposed project, all the study intersections are expected to continue to operate at the same Levels of Service as during the Year 2025 PM peak hour of traffic without the proposed project. Figure 14 depicts the PM peak hour traffic with the proposed project.

V. Recommendations and Conclusions

A. Recommendations

1. Recommendations Without Project

a. The existing LOS "F" conditions on Poalima Street at Kalanianaole Highway, during the AM peak hour of traffic, can be mitigated by modifying the traffic signal phasing and timing to include "split" phases on Poalima Street and the shopping center driveway. The proposed traffic signal modification can be expected to improve traffic operations on Poalima Street to LOS "D", during the AM and mid-afternoon peak hours of traffic.

b. "ONE LANE BRIDGE" warning signs should be installed in advance of the existing culvert crossing on Hihimanu Street between Nonokio Street and Waikupanaha Street, in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), published by the Federal Highways Administration, U.S. Department of Transportation.

2. Recommendations With Project

a. Appropriate school warning signs and school speed limit signs should be installed in the vicinity of the proposed MHPCS site along Hihimanu Street, Ahiki Street, and Waikupanaha Street, in accordance with the MUTCD.

b. A shuttle service should be considered for transit riders and students from East Honolulu between St. Matthew's Episcopal Church and the proposed project site.

c. A shuttle service also should be considered for students walking to/from school between the Albert H. Azevedo Field (Waimanalo District Park) and the proposed project site.

d. Malama Honua PCS should consider organizing carpools to minimize the vehicular and pedestrian traffic to/from the school.

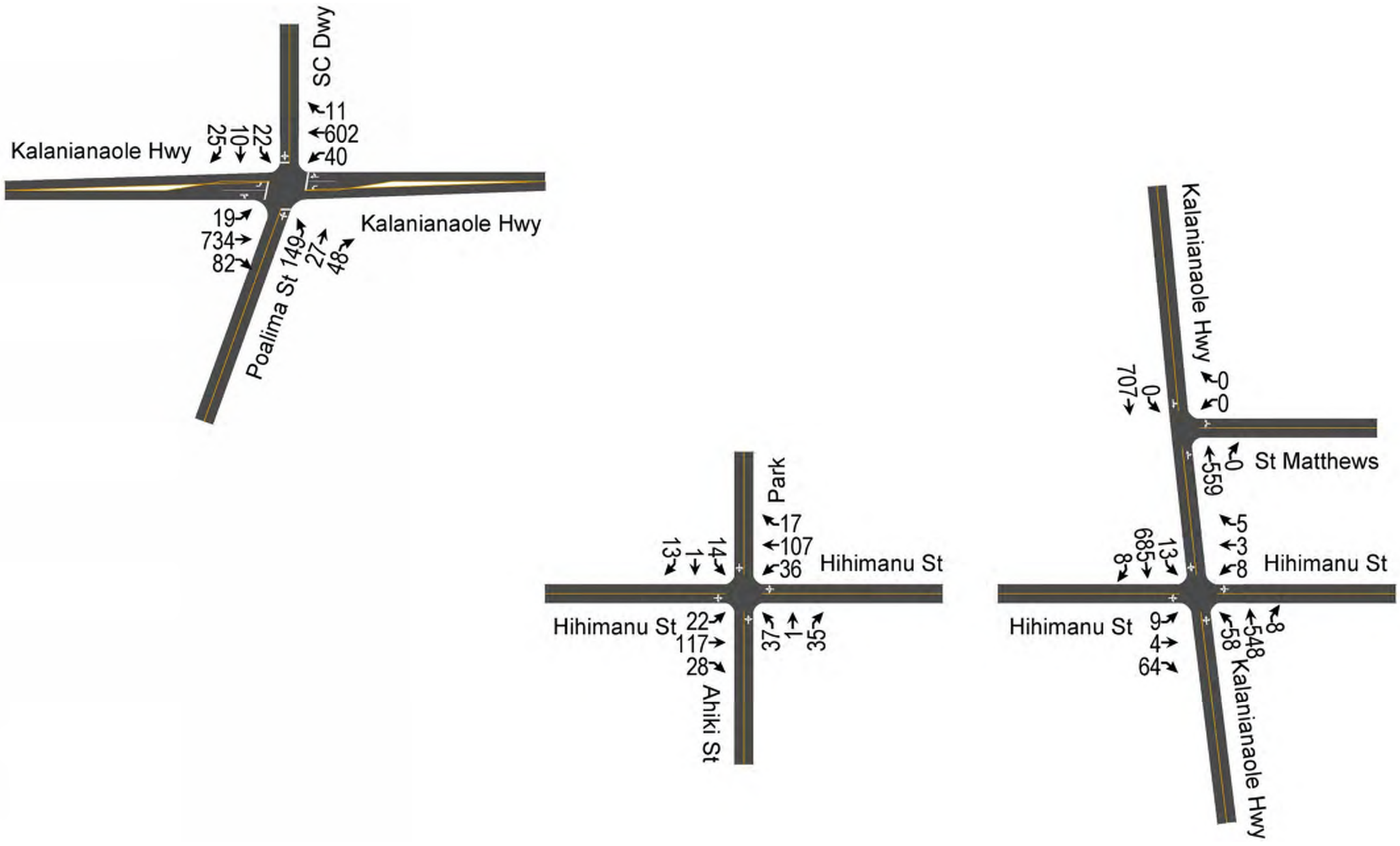


Figure 14. PM Peak Hour Traffic With Project

B. Conclusions

The proposed Malama Honua Public Charter School relocation and expansion is expected to reduce the existing traffic demands on Kalanianaole Highway between Poalima Street and Hihimanu Street, by redirecting school traffic to Hihimanu Street.

Ahiki Street is a low-volume roadway with a narrow pavement and limited shoulder space for pedestrians. Most of the students are expected to be dropped off and picked up or shuttled to/from the project site. The above recommendations are expected to mitigate the transportation impacts resulting from the development of the proposed Malama Honua Public Charter School. Table 5 summarizes the results of the capacity analysis.

Table 5. Summary of Capacity Analysis

Scenario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
Existing AM Peak Hour Traffic	Poalima St/SC Dwy & Kalanianaole Hwy	LOS	A	B		A	B		F			C			C
		Delay	5.9	12.1		6.7	11.1		81.9			22.0			20.6
		v/c	0.06	0.63		0.13	0.58		0.90			0.24			0.90 (max.)
	Ahiki St/Park & Hihimanu St	LOS	A	A		A	A		A			A			A
		Delay	7.5	0.0		7.5	0.0		9.3			9.6			2.0
		v/c	0.01	N/A		0.01	N/A		0.04			0.02			N/A
	Kalanianaole Hwy & Hihimanu St	LOS	D			C			A	A		A	A		A
		Delay	26.1			19.3			8.8	0.0		8.8	0.0		3.2
		v/c	0.42			0.14			0.06	N/A		0.00	N/A		N/A
	Kalanianaole Hwy & St Matthews Dwy	LOS	N/A	N/A	N/A	C	N/A	C	N/A	A		A	A	N/A	A
		Delay	N/A	N/A	N/A	19.0	N/A	19.0	N/A	0.0		9.1	0.0	N/A	1.9
		v/c	N/A	N/A	N/A	0.30	N/A	0.30	N/A	N/A		0.05	N/A	N/A	N/A
Existing Mid-PM Peak Hour Traffic	Poalima St/SC Dwy & Kalanianaole Hwy	LOS	A	B		A	B		D			C			B
		Delay	5.6	12.6		5.7	10.6		53.0			22.4			17.1
		v/c	0.05	0.67		0.05	0.58		0.79			0.18			0.79 (max.)
	Ahiki St/Park & Hihimanu St	LOS	A	A		A	A		B			B			A
		Delay	7.7	0.0		7.4	0.0		10.2			10.9			4.2
		v/c	0.02	N/A		0.01	N/A		0.08			0.14			N/A
	Kalanianaole Hwy & Hihimanu St	LOS	A			A			A	A		A	A		A
		Delay	9.3			9.2			7.7	0.0		8.7	0.0		1.0
		v/c	0.08			0.02			0.03	N/A		0.02	N/A		N/A
	Kalanianaole Hwy & St Matthews Dwy	LOS	N/A	N/A	N/A	C	N/A	C	N/A	A		A	A	N/A	A
		Delay	N/A	N/A	N/A	18.1	N/A	18.1	N/A	0.0		8.8	0.0	N/A	1.7
		v/c	N/A	N/A	N/A	0.28	N/A	0.28	N/A	N/A		0.03	N/A	N/A	N/A
Existing PM Peak Hour Traffic	Poalima St/SC Dwy & Kalanianaole Hwy	LOS	A	B		A	B		D			B			B
		Delay	6.0	13.6		7.7	10.4		36.1			18.8			14.9
		v/c	0.05	0.69		0.17	0.54		0.59			0.15			0.69 (max.)
	Ahiki St/Park & Hihimanu St	LOS	A	A		A	A		B			B			A
		Delay	7.5	0.0		7.5	0.0		10.4			10.4			2.9
		v/c	0.02	N/A		0.02	N/A		0.05			0.06			N/A
	Kalanianaole Hwy & Hihimanu St	LOS	A			A			A	A		A	A		A
		Delay	9.1			9.5			7.7	0.0		8.9	0.0		1.0
		v/c	0.09			0.01			0.03	N/A		0.02	N/A		N/A
	Kalanianaole Hwy & St Matthews Dwy	LOS	N/A	N/A	N/A	B	N/A	B	N/A	A		A	A	N/A	A
		Delay	N/A	N/A	N/A	13.3	N/A	13.3	N/A	0.0		8.7	0.0	N/A	0.2
		v/c	N/A	N/A	N/A	0.03	N/A	0.03	N/A	N/A		0.01	N/A	N/A	N/A

Table 5. Summary of Capacity Analysis (Cont'd.)															
Scenario	**Intersection**	**MOE**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**Intersection**
AM Peak Hour Traffic Without Project	**Poalima St/SC Dwy & Kalanianaole Hwy**	**LOS**	A	B		A	B		F			C			C
		Delay	6.0	12.7		6.9	11.5		88.3			23.0			21.9
		v/c	0.07	0.65		0.13	0.60		0.93			0.25			0.93 (max.)
	Ahiki St/Park & Hihimanu St	**LOS**	A	A		A	A		A			A			A
		Delay	7.5	0.0		7.5	0.0		9.3			9.7			2.0
		v/c	0.01	N/A		0.01	N/A		0.05			0.02			N/A
	Kalanianaole Hwy & Hihimanu St	**LOS**	D			C			A	A		A	A		A
		Delay	29.3			20.1			8.8	0.0		8.9	0.0		3.6
		v/c	0.47			0.15			0.06	N/A		0.00	N/A		N/A
	Kalanianaole Hwy & St Matthews Dwy	**LOS**	N/A	N/A	N/A	C	N/A	C	N/A	A		A	A	N/A	A
		Delay	N/A	N/A	N/A	20.0	N/A	20.0	N/A	0.0		9.2	0.0	N/A	1.9
		v/c	N/A	N/A	N/A	0.32	N/A	0.32	N/A	N/A		0.06	N/A	N/A	N/A
Mid-PM Peak Hour Traffic Without Project	**Poalima St/SC Dwy & Kalanianaole Hwy**	**LOS**	A	B		A	B		D			C			B
		Delay	5.7	13.3		5.7	10.9		51.5			22.2			17.4
		v/c	0.06	0.69		0.05	0.60		0.78			0.19			0.78 (max.)
	Ahiki St/Park & Hihimanu St	**LOS**	A	A		A	A		B			B			A
		Delay	7.7	0.0		7.4	0.0		10.3			11.1			4.3
		v/c	0.03	N/A		0.01	N/A		0.08			0.14			N/A
	Kalanianaole Hwy & Hihimanu St	**LOS**	A			A			A	A		A	A		A
		Delay	9.4			9.2			7.7	0.0		8.7	0.0		1.0
		v/c	0.09			0.02			0.03	N/A		0.02	N/A		N/A
	Kalanianaole Hwy & St Matthews Dwy	**LOS**	N/A	N/A	N/A	C	N/A	C	N/A	A		A	A	N/A	A
		Delay	N/A	N/A	N/A	18.8	N/A	18.8	N/A	0.0		8.9	0.0	N/A	1.7
		v/c	N/A	N/A	N/A	0.30	N/A	0.30	N/A	N/A		0.03	N/A	N/A	N/A
PM Peak Hour Traffic Without Project	**Poalima St/SC Dwy & Kalanianaole Hwy**	**LOS**	A	B		A	B		D			B			B
		Delay	6.0	14.4		8.1	10.7		36.2			18.8			15.5
		v/c	0.05	0.71		0.19	0.56		0.49			0.16			0.71 (max.)
	Ahiki St/Park & Hihimanu St	**LOS**	A	A		A	A		B			B			A
		Delay	7.6	0.0		7.5	0.0		10.5			10.5			2.9
		v/c	0.02	N/A		0.02	N/A		0.06			0.06			N/A
	Kalanianaole Hwy & Hihimanu St	**LOS**	A			A			A	A		A	A		A
		Delay	9.1			9.6			7.7	0.0		9.0	0.0		1.0
		v/c	0.09			0.01			0.03	N/A		0.02	N/A		N/A
	Kalanianaole Hwy & St Matthews Dwy	**LOS**	N/A	N/A	N/A	B	N/A	B	N/A	A		A	A	N/A	A
		Delay	N/A	N/A	N/A	12.5	N/A	12.5	N/A	0.0		8.8	0.0	N/A	0.2
		v/c	N/A	N/A	N/A	0.02	N/A	0.02	N/A	N/A		0.01	N/A	N/A	N/A

Table 5. Summary of Capacity Analysis (Cont'd.)

Scenario	Intersection	MOE	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection
AM Peak Hour Traffic With Project	Poalima St/SC Dwy & Kalanianaole Hwy	LOS	A	B		A	B		F			C			C
		Delay	5.9	13.8		7.8	10.8		159.4			23.0			34.7
		v/c	0.06	0.70		0.19	0.56		1.19			0.26			1.19 (max.)
	Ahiki St/Park & Hihimanu St	LOS	A	A		A	A		B			B			A
		Delay	7.5	0.0		7.9	0.0		12.2			10.4			4.1
		v/c	0.01	N/A		0.04	N/A		0.23			0.02			N/A
	Kalanianaole Hwy & Hihimanu St	LOS	C			C			A	A		A	A		A
		Delay	18.9			22.2			9.0	0.0		8.8	0.0		3.0
		v/c	0.35			0.17			0.11	N/A		0.00	N/A		N/A
Mid-PM Peak Hour Traffic With Project	Poalima St/SC Dwy & Kalanianaole Hwy	LOS	A	B		A	B		E			C			C
		Delay	5.7	14.6		6.0	10.7		78.2			22.3			22.7
		v/c	0.05	0.74		0.07	0.58		0.96			0.19			0.96 (max.)
	Ahiki St/Park & Hihimanu St	LOS	A	A		A	A		B			B			A
		Delay	7.7	0.0		7.5	0.0		14.0			11.8			6.7
		v/c	0.03	N/A		0.03	N/A		0.33			0.16			N/A
	Kalanianaole Hwy & Hihimanu St	LOS	A			A			A	A		A	A		A
		Delay	9.3			9.3			7.7	0.0		8.6	0.0		1.3
		v/c	0.11			0.02			0.04	N/A		0.02	N/A		N/A
PM Peak Hour Traffic With Project	Poalima St/SC Dwy & Kalanianaole Hwy	LOS	A	B		A	B		D			B			B
		Delay	6.0	14.7		8.3	10.6		40.2			18.9			16.2
		v/c	0.05	0.73		0.20	0.56		0.67			0.16			0.73 (max.)
	Ahiki St/Park & Hihimanu St	LOS	A	A		A	A		B			B			A
		Delay	7.6	0.0		7.6	0.0		11.5			10.7			3.7
		v/c	0.02	N/A		0.02	N/A		0.12			0.06			N/A
	Kalanianaole Hwy & Hihimanu St	LOS	A			A			A	A		A	A		A
		Delay	9.2			9.6			7.7	0.0		9.0	0.0		1.1
		v/c	0.11			0.01			0.04	N/A		0.02	N/A		N/A

Table 5. Summary of Capacity Analysis (Cont'd.)															
Scenario	**Intersection**	**MOE**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**Intersection**
AM Peak Hour Traffic W/Project W/Improvements	**Poalima St/SC Dwy & Kalanianaole Hwy**	**LOS**	B	C		C	C		D			D			C
		Delay	11.8	31.4		24.7	21.3		54.8			37.8			31.3
		v/c	0.11	0.88		0.43	0.72		0.82			0.56			0.88 (max.)
Mid-PM Peak Hour Traffic W/Project W/Improvements	**Poalima St/SC Dwy & Kalanianaole Hwy**	**LOS**	B	C		B	C		D			D			C
		Delay	11.0	33.3		12.7	20.6		49.9			38.9			30.8
		v/c	0.09	0.90		0.13	0.71		0.79			0.44			0.90 (max.)
PM Peak Hour Traffic W/Project W/Improvements	**Poalima St/SC Dwy & Kalanianaole Hwy**	**LOS**	A	C		B	B		D			D			C
		Delay	9.5	23.7		14.7	16.4		45.2			37.8			23.7
		v/c	0.07	0.81		0.28	0.62		0.66			0.41			0.81 (max.)

Legend

MOE–Measure of Effectiveness
LOS –Level of Service
Delay–Average Delay (seconds/vehicle)
v/c–Volume-to-Capacity Ratio

EBL–Eastbound Left-Turn Movement
EBT–Eastbound Through Movement
EBR–Eastbound Right–Turn Movement

WBL–Westbound Left-Turn Movement
WBT–Westbound Through Movement
WBR–Westbound Right-Turn Movement

NBL–Northbound Left-Turn Movement
NBT–Northbound Through Movement
NBR–Northbound Right-Turn Movement

SBL–Southbound Left-Turn Movement
SBT–Southbound Through Movement
SBR–Southbound Right-Turn Movement

TRANSPORTATION ASSESSMENT REPORT

FOR THE PROPOSED

MALAMA HONUA PUBLIC CHARTER SCHOOL RELOCATION AND EXPANSION

WAIMANALO, OAHU, HAWAII

TAX MAP KEY: 4-1-026:PORTION OF 001

APPENDIX A

TRAFFIC COUNT DATA

The Traffic Management Consultant
1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Data

Start Time	Kalanianaole Hwy Eastbound					Kalanianaole Hwy Westbound					Poalima St Northbound					Shopping Ctr Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
2:00 PM	8	157	12	1	177	8	135	5	0	148	40	2	14	1	56	4	2	9	0	15	396
2:15 PM	6	160	12	0	178	13	149	1	3	163	32	4	14	19	50	6	2	2	2	10	401
2:30 PM	5	158	26	6	189	4	167	1	0	172	41	4	10	2	55	6	4	5	1	15	431
2:45 PM	7	159	18	3	184	8	168	0	1	176	32	3	14	1	49	2	1	11	2	14	423
Hourly Total	26	634	68	10	728	33	619	7	4	659	145	13	52	23	210	18	9	27	5	54	1651
3:00 PM	3	166	15	2	184	10	147	2	0	159	39	2	16	1	57	5	3	6	0	14	414
3:15 PM	7	164	17	5	188	12	151	1	2	164	29	6	9	0	44	5	0	6	0	11	407
3:30 PM	5	150	24	5	179	5	151	3	1	159	39	8	9	1	56	9	3	6	1	18	412
3:45 PM	5	171	23	2	199	13	151	5	1	169	29	7	13	2	49	6	1	6	1	13	430
Hourly Total	20	651	79	14	750	40	600	11	4	651	136	23	47	4	206	25	7	24	2	56	1663
4:00 PM	3	189	15	2	207	6	141	1	0	148	36	5	13	0	54	4	4	7	0	15	424
4:15 PM	5	164	13	3	182	7	150	4	0	161	35	10	12	3	57	7	2	4	2	13	413
4:30 PM	5	188	19	2	212	11	143	1	2	155	30	4	6	0	40	4	3	7	0	14	421
4:45 PM	6	181	20	3	207	11	139	4	0	154	23	7	9	4	39	6	11	5	0	22	422
Hourly Total	19	722	67	10	808	35	573	10	2	618	124	26	40	7	190	21	20	23	2	64	1680
5:00 PM	3	170	17	0	190	9	136	1	0	146	25	3	20	1	48	5	1	5	1	11	395
5:15 PM	6	176	25	2	207	12	133	1	4	146	23	10	10	0	43	5	3	9	1	17	413
5:30 PM	9	116	12	0	137	6	139	1	0	146	24	8	7	0	39	7	2	8	0	17	339
5:45 PM	3	164	6	0	173	11	122	1	0	134	21	8	7	2	36	6	0	10	0	16	359
Hourly Total	21	626	60	2	707	38	530	4	4	572	93	29	44	3	166	23	6	32	2	61	1506
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:30 AM	4	68	18	13	90	4	134	1	1	139	30	3	6	5	39	3	5	4	0	12	280
6:45 AM	7	87	30	6	124	5	128	5	5	138	28	8	4	4	40	3	5	6	0	14	316
Hourly Total	11	155	48	19	214	9	262	6	6	277	58	11	10	9	79	6	10	10	0	26	596
7:00 AM	7	111	22	5	140	5	185	5	3	195	31	10	8	11	49	6	4	9	4	19	403
7:15 AM	6	173	21	9	200	11	178	1	4	190	38	7	13	2	58	4	5	12	4	21	469
7:30 AM	9	171	16	1	196	5	131	2	2	138	40	8	16	4	64	7	5	6	1	18	416
7:45 AM	5	175	20	2	200	12	181	5	2	198	26	6	17	5	49	2	5	10	2	17	464
Hourly Total	27	630	79	17	736	33	675	13	11	721	135	31	54	22	220	19	19	37	11	75	1752
8:00 AM	4	135	26	2	165	6	145	3	0	154	38	6	13	5	57	8	1	7	2	16	392
8:15 AM	4	119	21	5	144	4	135	5	0	144	27	8	3	0	38	4	1	5	4	10	336
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	8	254	47	7	309	10	280	8	0	298	65	14	16	5	95	12	2	12	6	26	728
2:00 PM	5	147	19	4	171	10	149	5	0	164	19	4	16	1	39	7	3	2	2	12	386
2:15 PM	8	151	17	3	176	11	162	3	4	176	41	4	14	23	59	8	4	10	0	22	433
2:30 PM	4	164	27	3	195	8	137	5	0	150	35	3	7	1	45	1	2	7	0	10	400
2:45 PM	6	168	20	2	194	8	156	4	1	168	25	2	7	4	34	6	7	7	0	20	416
Hourly Total	23	630	83	12	736	37	604	17	5	658	120	13	44	29	177	22	16	26	2	64	1635
3:00 PM	3	149	21	4	173	7	150	0	0	157	28	8	9	3	45	3	4	6	2	13	388
3:15 PM	7	162	17	2	186	8	183	0	0	191	32	4	2	1	38	5	4	6	0	15	430
3:30 PM	7	165	17	3	189	6	137	2	0	145	42	7	14	2	63	8	4	6	1	18	415

3:45 PM	6	159	20	5	185	8	134	2	0	144	34	5	9	1	48	3	3	7	1	13	390
Hourly Total	23	635	75	14	733	29	604	4	0	637	136	24	34	7	194	19	15	25	4	59	1623
4:00 PM	7	170	21	1	198	10	126	0	0	136	34	7	7	0	48	2	3	7	0	12	394
4:15 PM	7	179	26	6	212	9	141	0	1	150	20	0	11	2	31	7	3	8	0	18	411
4:30 PM	6	175	20	4	201	10	145	1	6	156	37	5	8	2	50	3	3	8	2	14	421
4:45 PM	6	176	14	7	196	2	150	2	0	154	30	7	14	1	51	5	2	8	3	15	416
Hourly Total	26	700	81	18	807	31	562	3	7	596	121	19	40	5	180	17	11	31	5	59	1642
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5:00 AM	6	20	2	0	28	0	62	2	2	64	9	0	0	0	9	0	0	3	0	3	104
5:15 AM	0	33	8	1	41	1	95	2	1	98	13	0	1	1	14	2	0	7	0	9	162
5:30 AM	3	38	9	2	50	3	91	2	0	96	16	2	5	2	23	1	0	6	1	7	176
5:45 AM	3	64	6	0	73	4	114	1	4	119	25	6	5	2	36	2	1	8	2	11	239
Hourly Total	12	155	25	3	192	8	362	7	7	377	63	8	11	5	82	5	1	24	3	30	681
6:00 AM	4	59	6	2	69	1	133	2	2	136	20	4	4	1	28	1	4	8	1	13	246
6:15 AM	5	65	17	4	87	4	141	4	3	149	28	8	3	1	39	3	4	7	3	14	289
6:30 AM	3	68	21	9	92	7	111	0	1	118	26	7	5	2	38	5	4	16	1	25	273
6:45 AM	5	73	21	0	99	7	119	1	3	127	32	7	3	5	42	6	3	3	0	12	280
Hourly Total	17	265	65	15	347	19	504	7	9	530	106	26	15	9	147	15	15	34	5	64	1088
7:00 AM	6	103	23	6	132	7	166	3	4	176	34	5	13	0	52	3	5	8	1	16	376
7:15 AM	5	154	15	2	174	7	163	4	2	174	40	7	10	14	57	8	3	3	3	14	419
7:30 AM	7	170	21	4	198	7	158	7	2	172	41	7	22	6	70	4	6	7	0	17	457
7:45 AM	6	166	25	8	197	15	177	3	1	195	38	4	19	4	61	7	7	3	3	17	470
Hourly Total	24	593	84	20	701	36	664	17	9	717	153	23	64	24	240	22	21	21	7	64	1722
8:00 AM	4	136	16	2	156	8	144	2	1	154	36	6	7	0	49	5	1	7	2	13	372
8:15 AM	5	113	16	7	134	5	136	5	0	146	34	5	8	0	47	3	4	4	4	11	338
8:30 AM	9	125	19	3	153	9	148	3	0	160	25	7	8	0	40	3	4	10	0	17	370
8:45 AM	8	111	21	2	140	5	114	6	0	125	27	3	3	0	33	4	6	9	1	19	317
Hourly Total	26	485	72	14	583	27	542	16	1	585	122	21	26	0	169	15	15	30	7	60	1397
Grand Total	283	7135	933	175	8351	385	7381	130	69	7896	1577	281	497	152	2355	239	167	356	61	762	19364
Approach %	3.4	85.4	11.2	-	-	4.9	93.5	1.6	-	-	67.0	11.9	21.1	-	-	31.4	21.9	46.7	-	-	-
Total %	1.5	36.8	4.8	-	43.1	2.0	38.1	0.7	-	40.8	8.1	1.5	2.6	-	12.2	1.2	0.9	1.8	-	3.9	-
Motorcycles	2	36	11	-	49	2	22	0	-	24	10	2	1	-	13	2	1	1	-	4	90
% Motorcycles	0.7	0.5	1.2	-	0.6	0.5	0.3	0.0	-	0.3	0.6	0.7	0.2	-	0.6	0.8	0.6	0.3	-	0.5	0.5
Cars	203	5214	533	-	5950	278	5465	94	-	5837	1026	185	368	-	1579	162	119	250	-	531	13897
% Cars	71.7	73.1	57.1	-	71.2	72.2	74.0	72.3	-	73.9	65.1	65.8	74.0	-	67.0	67.8	71.3	70.2	-	69.7	71.8
Light Goods Vehicles	74	1707	338	-	2119	91	1703	29	-	1823	465	87	109	-	661	67	43	94	-	204	4807
% Light Goods Vehicles	26.1	23.9	36.2	-	25.4	23.6	23.1	22.3	-	23.1	29.5	31.0	21.9	-	28.1	28.0	25.7	26.4	-	26.8	24.8
Buses	1	99	7	-	107	4	101	6	-	111	6	0	8	-	14	3	1	3	-	7	239
% Buses	0.4	1.4	0.8	-	1.3	1.0	1.4	4.6	-	1.4	0.4	0.0	1.6	-	0.6	1.3	0.6	0.8	-	0.9	1.2
Single-Unit Trucks	1	68	33	-	102	9	72	1	-	82	59	5	9	-	73	5	2	8	-	15	272
% Single-Unit Trucks	0.4	1.0	3.5	-	1.2	2.3	1.0	0.8	-	1.0	3.7	1.8	1.8	-	3.1	2.1	1.2	2.2	-	2.0	1.4
Articulated Trucks	2	7	6	-	15	1	12	0	-	13	11	1	1	-	13	0	0	0	-	0	41
% Articulated Trucks	0.7	0.1	0.6	-	0.2	0.3	0.2	0.0	-	0.2	0.7	0.4	0.2	-	0.6	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Road	0	4	5	-	9	0	6	0	-	6	0	1	1	-	2	0	1	0	-	1	18
% Bicycles on Road	0.0	0.1	0.5	-	0.1	0.0	0.1	0.0	-	0.1	0.0	0.4	0.2	-	0.1	0.0	0.6	0.0	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	10	-	-	-	-	4	-	-	-	-	10	-	-	-	-	6	-	-
% Bicycles on Crosswalk	-	-	-	5.7	-	-	-	-	5.8	-	-	-	-	6.6	-	-	-	-	9.8	-	-
Pedestrians	-	-	-	165	-	-	-	-	65	-	-	-	-	142	-	-	-	-	55	-	-
% Pedestrians	-	-	-	94.3	-	-	-	-	94.2	-	-	-	-	93.4	-	-	-	-	90.2	-	-

The Traffic Management Consultant
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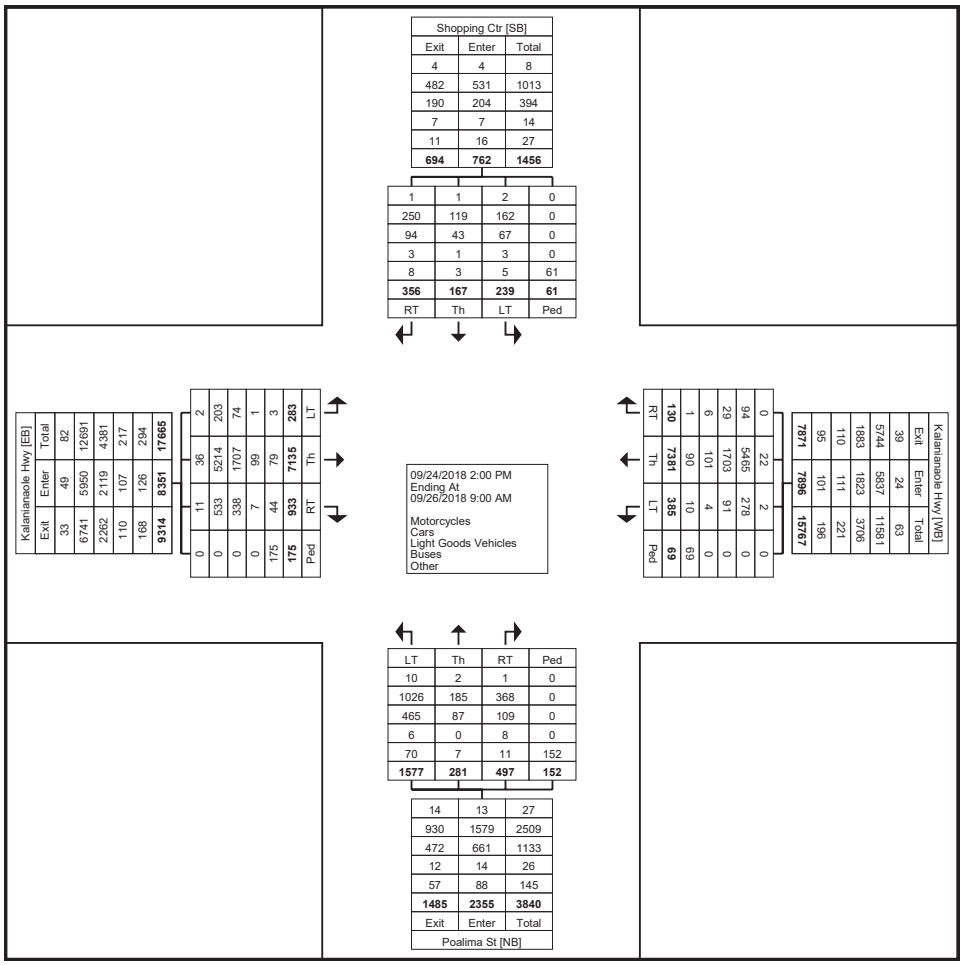
808-536-0223 tmchawaii@aol.com

Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Data Plot

The Traffic Management Consultant
1188 Bishop Street, Suite 1907

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Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (3:45 PM)

Start Time	Kalanianaole Hwy Eastbound					Kalanianaole Hwy Westbound					Poalima St Northbound					Shopping Ctr Southbound					Int. Total
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	
3:45 PM	5	171	23	2	199	13	151	5	1	169	29	7	13	2	49	6	1	6	1	13	430
4:00 PM	3	189	15	2	207	6	141	1	0	148	36	5	13	0	54	4	4	7	0	15	424
4:15 PM	5	164	13	3	182	7	150	4	0	161	35	10	12	3	57	7	2	4	2	13	413
4:30 PM	5	188	19	2	212	11	143	1	2	155	30	4	6	0	40	4	3	7	0	14	421
Total	18	712	70	9	800	37	585	11	3	633	130	26	44	5	200	21	10	24	3	55	1688
Approach %	2.3	89.0	8.8	-	-	5.8	92.4	1.7	-	-	65.0	13.0	22.0	-	-	38.2	18.2	43.6	-	-	-
Total %	1.1	42.2	4.1	-	47.4	2.2	34.7	0.7	-	37.5	7.7	1.5	2.6	-	11.8	1.2	0.6	1.4	-	3.3	-
PHF	0.900	0.942	0.761	-	0.943	0.712	0.969	0.550	-	0.936	0.903	0.650	0.846	-	0.877	0.750	0.625	0.857	-	0.917	0.981
Motorcycles	0	5	1	-	6	0	3	0	-	3	0	0	0	-	0	0	0	0	-	0	9
% Motorcycles	0.0	0.7	1.4	-	0.8	0.0	0.5	0.0	-	0.5	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.5
Cars	12	517	44	-	573	29	451	8	-	488	80	20	32	-	132	16	7	19	-	42	1235
% Cars	66.7	72.6	62.9	-	71.6	78.4	77.1	72.7	-	77.1	61.5	76.9	72.7	-	66.0	76.2	70.0	79.2	-	76.4	73.2
Light Goods Vehicles	6	179	23	-	208	8	124	1	-	133	49	6	10	-	65	5	3	4	-	12	418
% Light Goods Vehicles	33.3	25.1	32.9	-	26.0	21.6	21.2	9.1	-	21.0	37.7	23.1	22.7	-	32.5	23.8	30.0	16.7	-	21.8	24.8
Buses	0	8	1	-	9	0	6	1	-	7	0	0	0	-	0	0	0	1	-	1	17
% Buses	0.0	1.1	1.4	-	1.1	0.0	1.0	9.1	-	1.1	0.0	0.0	0.0	-	0.0	0.0	0.0	4.2	-	1.8	1.0
Single-Unit Trucks	0	3	0	-	3	0	1	1	-	2	1	0	1	-	2	0	0	0	-	0	7
% Single-Unit Trucks	0.0	0.4	0.0	-	0.4	0.0	0.2	9.1	-	0.3	0.8	0.0	2.3	-	1.0	0.0	0.0	0.0	-	0.0	0.4
Articulated Trucks	0	0	1	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	1.4	-	0.1	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	1	-	1	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	2.3	-	0.5	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	9	-	-	-	-	3	-	-	-	-	5	-	-	-	-	3	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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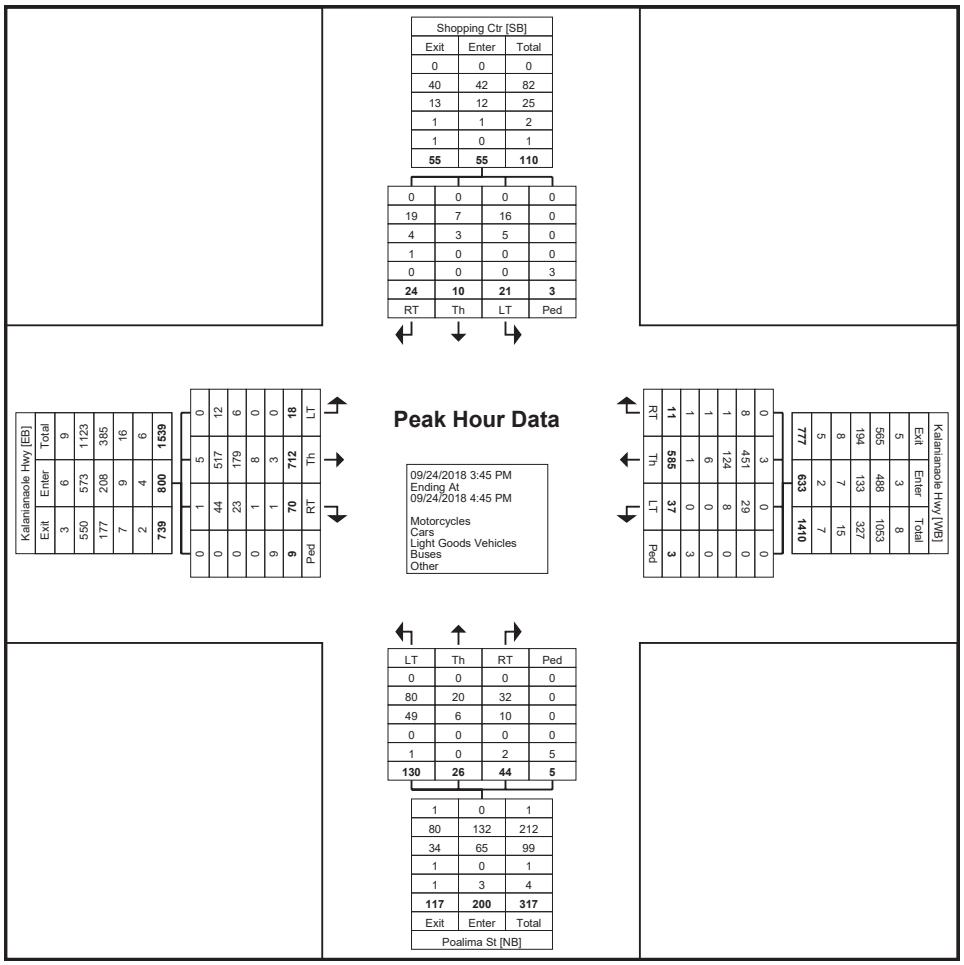
808-536-0223 tmchawaii@aol.com

Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (3:45 PM)

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Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (2:15 PM)

Start Time	Kalanianaole Hwy Eastbound					Kalanianaole Hwy Westbound					Poalima St Northbound					Shopping Ctr Southbound					Int. Total
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	
2:15 PM	6	160	12	0	178	13	149	1	3	163	32	4	14	19	50	6	2	2	2	10	401
2:30 PM	5	158	26	6	189	4	167	1	0	172	41	4	10	2	55	6	4	5	1	15	431
2:45 PM	7	159	18	3	184	8	168	0	1	176	32	3	14	1	49	2	1	11	2	14	423
3:00 PM	3	166	15	2	184	10	147	2	0	159	39	2	16	1	57	5	3	6	0	14	414
Total	21	643	71	11	735	35	631	4	4	670	144	13	54	23	211	19	10	24	5	53	1669
Approach %	2.9	87.5	9.7	-	-	5.2	94.2	0.6	-	-	68.2	6.2	25.6	-	-	35.8	18.9	45.3	-	-	-
Total %	1.3	38.5	4.3	-	44.0	2.1	37.8	0.2	-	40.1	8.6	0.8	3.2	-	12.6	1.1	0.6	1.4	-	3.2	-
PHF	0.750	0.968	0.683	-	0.972	0.673	0.939	0.500	-	0.952	0.878	0.813	0.844	-	0.925	0.792	0.625	0.545	-	0.883	0.968
Motorcycles	0	8	0	-	8	0	2	0	-	2	1	0	0	-	1	0	0	0	-	0	11
% Motorcycles	0.0	1.2	0.0	-	1.1	0.0	0.3	0.0	-	0.3	0.7	0.0	0.0	-	0.5	0.0	0.0	0.0	-	0.0	0.7
Cars	15	473	43	-	531	28	497	3	-	528	92	10	40	-	142	14	7	18	-	39	1240
% Cars	71.4	73.6	60.6	-	72.2	80.0	78.8	75.0	-	78.8	63.9	76.9	74.1	-	67.3	73.7	70.0	75.0	-	73.6	74.3
Light Goods Vehicles	6	144	22	-	172	7	123	1	-	131	43	3	12	-	58	5	3	5	-	13	374
% Light Goods Vehicles	28.6	22.4	31.0	-	23.4	20.0	19.5	25.0	-	19.6	29.9	23.1	22.2	-	27.5	26.3	30.0	20.8	-	24.5	22.4
Buses	0	13	1	-	14	0	9	0	-	9	1	0	1	-	2	0	0	0	-	0	25
% Buses	0.0	2.0	1.4	-	1.9	0.0	1.4	0.0	-	1.3	0.7	0.0	1.9	-	0.9	0.0	0.0	0.0	-	0.0	1.5
Single-Unit Trucks	0	5	5	-	10	0	0	0	-	0	3	0	1	-	4	0	0	1	-	1	15
% Single-Unit Trucks	0.0	0.8	7.0	-	1.4	0.0	0.0	0.0	-	0.0	2.1	0.0	1.9	-	1.9	0.0	0.0	4.2	-	1.9	0.9
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	4	0	0	-	4	0	0	0	-	0	4
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	2.8	0.0	0.0	-	1.9	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	2	-	-	-	-	1	-	-	-	-	2	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	18.2	-	-	-	-	25.0	-	-	-	-	8.7	-	-	-	-	20.0	-	-
Pedestrians	-	-	-	9	-	-	-	-	3	-	-	-	-	21	-	-	-	-	4	-	-
% Pedestrians	-	-	-	81.8	-	-	-	-	75.0	-	-	-	-	91.3	-	-	-	-	80.0	-	-

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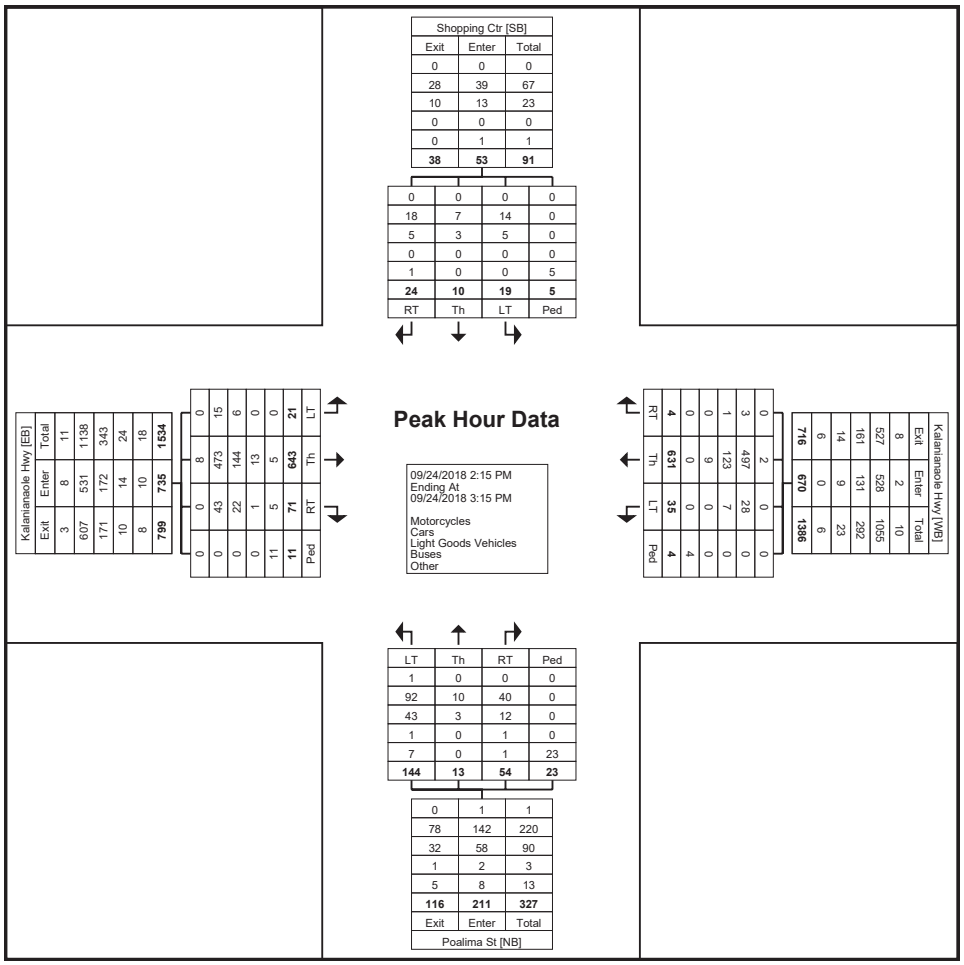
Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (2:15 PM)

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Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Kalanianaole Hwy Eastbound					Kalanianaole Hwy Westbound					Poalima St Northbound					Shopping Ctr Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:00 AM	7	111	22	5	140	5	185	5	3	195	31	10	8	11	49	6	4	9	4	19	403
7:15 AM	6	173	21	9	200	11	178	1	4	190	38	7	13	2	58	4	5	12	4	21	469
7:30 AM	9	171	16	1	196	5	131	2	2	138	40	8	16	4	64	7	5	6	1	18	416
7:45 AM	5	175	20	2	200	12	181	5	2	198	26	6	17	5	49	2	5	10	2	17	464
Total	27	630	79	17	736	33	675	13	11	721	135	31	54	22	220	19	19	37	11	75	1752
Approach %	3.7	85.6	10.7	-	-	4.6	93.6	1.8	-	-	61.4	14.1	24.5	-	-	25.3	25.3	49.3	-	-	-
Total %	1.5	36.0	4.5	-	42.0	1.9	38.5	0.7	-	41.2	7.7	1.8	3.1	-	12.6	1.1	1.1	2.1	-	4.3	-
PHF	0.750	0.900	0.898	-	0.920	0.688	0.912	0.650	-	0.910	0.844	0.775	0.794	-	0.859	0.679	0.950	0.771	-	0.893	0.934
Motorcycles	0	0	1	-	1	0	1	0	-	1	0	0	0	-	0	1	0	0	-	1	3
% Motorcycles	0.0	0.0	1.3	-	0.1	0.0	0.1	0.0	-	0.1	0.0	0.0	0.0	-	0.0	5.3	0.0	0.0	-	1.3	0.2
Cars	20	452	47	-	519	25	515	10	-	550	93	21	44	-	158	14	12	30	-	56	1283
% Cars	74.1	71.7	59.5	-	70.5	75.8	76.3	76.9	-	76.3	68.9	67.7	81.5	-	71.8	73.7	63.2	81.1	-	74.7	73.2
Light Goods Vehicles	6	167	27	-	200	7	143	3	-	153	34	9	9	-	52	4	7	7	-	18	423
% Light Goods Vehicles	22.2	26.5	34.2	-	27.2	21.2	21.2	23.1	-	21.2	25.2	29.0	16.7	-	23.6	21.1	36.8	18.9	-	24.0	24.1
Buses	0	5	0	-	5	0	8	0	-	8	0	0	1	-	1	0	0	0	-	0	14
% Buses	0.0	0.8	0.0	-	0.7	0.0	1.2	0.0	-	1.1	0.0	0.0	1.9	-	0.5	0.0	0.0	0.0	-	0.0	0.8
Single-Unit Trucks	0	5	2	-	7	0	3	0	-	3	4	0	0	-	4	0	0	0	-	0	14
% Single-Unit Trucks	0.0	0.8	2.5	-	1.0	0.0	0.4	0.0	-	0.4	3.0	0.0	0.0	-	1.8	0.0	0.0	0.0	-	0.0	0.8
Articulated Trucks	1	1	0	-	2	1	3	0	-	4	4	0	0	-	4	0	0	0	-	0	10
% Articulated Trucks	3.7	0.2	0.0	-	0.3	3.0	0.4	0.0	-	0.6	3.0	0.0	0.0	-	1.8	0.0	0.0	0.0	-	0.0	0.6
Bicycles on Road	0	0	2	-	2	0	2	0	-	2	0	1	0	-	1	0	0	0	-	0	5
% Bicycles on Road	0.0	0.0	2.5	-	0.3	0.0	0.3	0.0	-	0.3	0.0	3.2	0.0	-	0.5	0.0	0.0	0.0	-	0.0	0.3
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	17	-	-	-	-	11	-	-	-	-	22	-	-	-	-	11	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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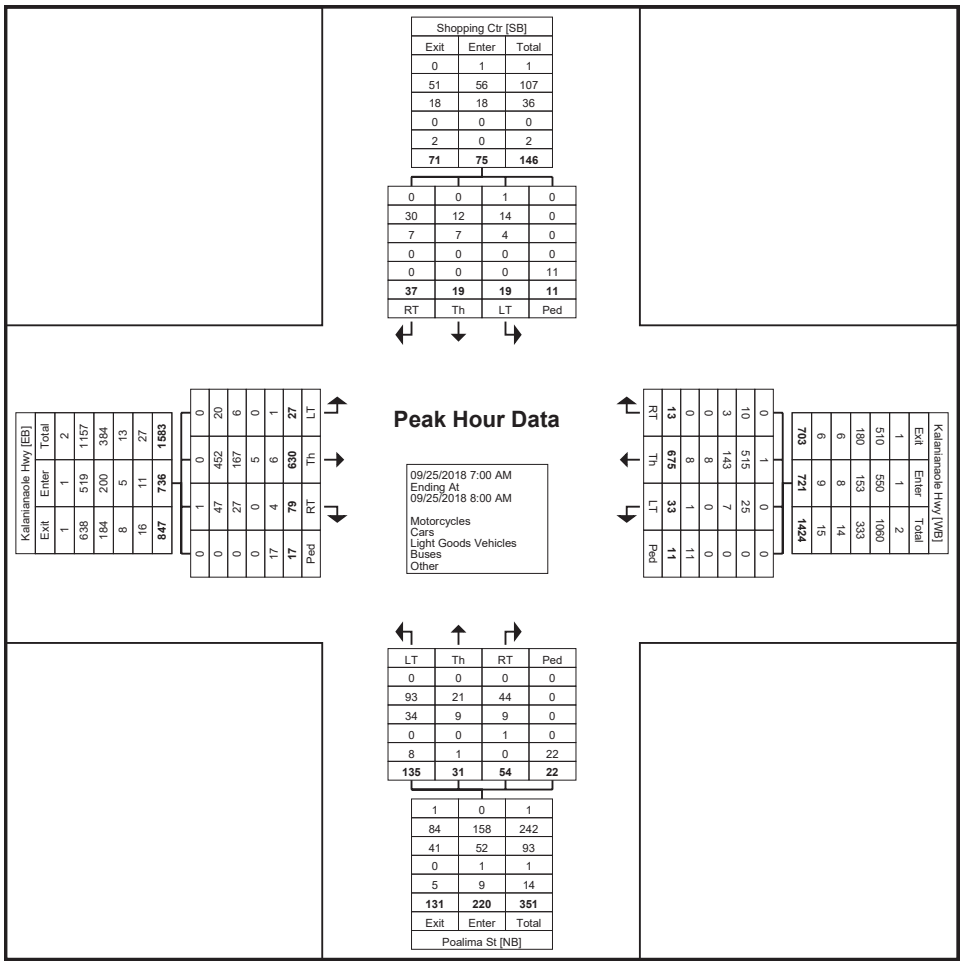
Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (7:00 AM)

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808-536-0223 tmchawaii@aol.com

Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (2:15 PM)

Start Time	Kalanianaole Hwy Eastbound					Kalanianaole Hwy Westbound					Poalima St Northbound					Shopping Ctr Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
2:15 PM	8	151	17	3	176	11	162	3	4	176	41	4	14	23	59	8	4	10	0	22	433
2:30 PM	4	164	27	3	195	8	137	5	0	150	35	3	7	1	45	1	2	7	0	10	400
2:45 PM	6	168	20	2	194	8	156	4	1	168	25	2	7	4	34	6	7	7	0	20	416
3:00 PM	3	149	21	4	173	7	150	0	0	157	28	8	9	3	45	3	4	6	2	13	388
Total	21	632	85	12	738	34	605	12	5	651	129	17	37	31	183	18	17	30	2	65	1637
Approach %	2.8	85.6	11.5	-	-	5.2	92.9	1.8	-	-	70.5	9.3	20.2	-	-	27.7	26.2	46.2	-	-	-
Total %	1.3	38.6	5.2	-	45.1	2.1	37.0	0.7	-	39.8	7.9	1.0	2.3	-	11.2	1.1	1.0	1.8	-	4.0	-
PHF	0.656	0.940	0.787	-	0.946	0.773	0.934	0.600	-	0.925	0.787	0.531	0.661	-	0.775	0.563	0.607	0.750	-	0.739	0.945
Motorcycles	0	4	1	-	5	0	4	0	-	4	0	0	0	-	0	0	0	0	-	0	9
% Motorcycles	0.0	0.6	1.2	-	0.7	0.0	0.7	0.0	-	0.6	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.5
Cars	15	466	46	-	527	26	452	8	-	486	85	12	22	-	119	14	10	25	-	49	1181
% Cars	71.4	73.7	54.1	-	71.4	76.5	74.7	66.7	-	74.7	65.9	70.6	59.5	-	65.0	77.8	58.8	83.3	-	75.4	72.1
Light Goods Vehicles	6	145	28	-	179	7	131	3	-	141	40	5	11	-	56	4	6	4	-	14	390
% Light Goods Vehicles	28.6	22.9	32.9	-	24.3	20.6	21.7	25.0	-	21.7	31.0	29.4	29.7	-	30.6	22.2	35.3	13.3	-	21.5	23.8
Buses	0	10	2	-	12	0	11	1	-	12	0	0	3	-	3	0	0	0	-	0	27
% Buses	0.0	1.6	2.4	-	1.6	0.0	1.8	8.3	-	1.8	0.0	0.0	8.1	-	1.6	0.0	0.0	0.0	-	0.0	1.6
Single-Unit Trucks	0	5	6	-	11	1	6	0	-	7	4	0	1	-	5	0	0	1	-	1	24
% Single-Unit Trucks	0.0	0.8	7.1	-	1.5	2.9	1.0	0.0	-	1.1	3.1	0.0	2.7	-	2.7	0.0	0.0	3.3	-	1.5	1.5
Articulated Trucks	0	2	1	-	3	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	4
% Articulated Trucks	0.0	0.3	1.2	-	0.4	0.0	0.2	0.0	-	0.2	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Road	0	0	1	-	1	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	2
% Bicycles on Road	0.0	0.0	1.2	-	0.1	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	5.9	0.0	-	1.5	0.1
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	2	-	-	-	-	1	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	8.3	-	-	-	-	40.0	-	-	-	-	3.2	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	11	-	-	-	-	3	-	-	-	-	30	-	-	-	-	2	-	-
% Pedestrians	-	-	-	91.7	-	-	-	-	60.0	-	-	-	-	96.8	-	-	-	-	100.0	-	-

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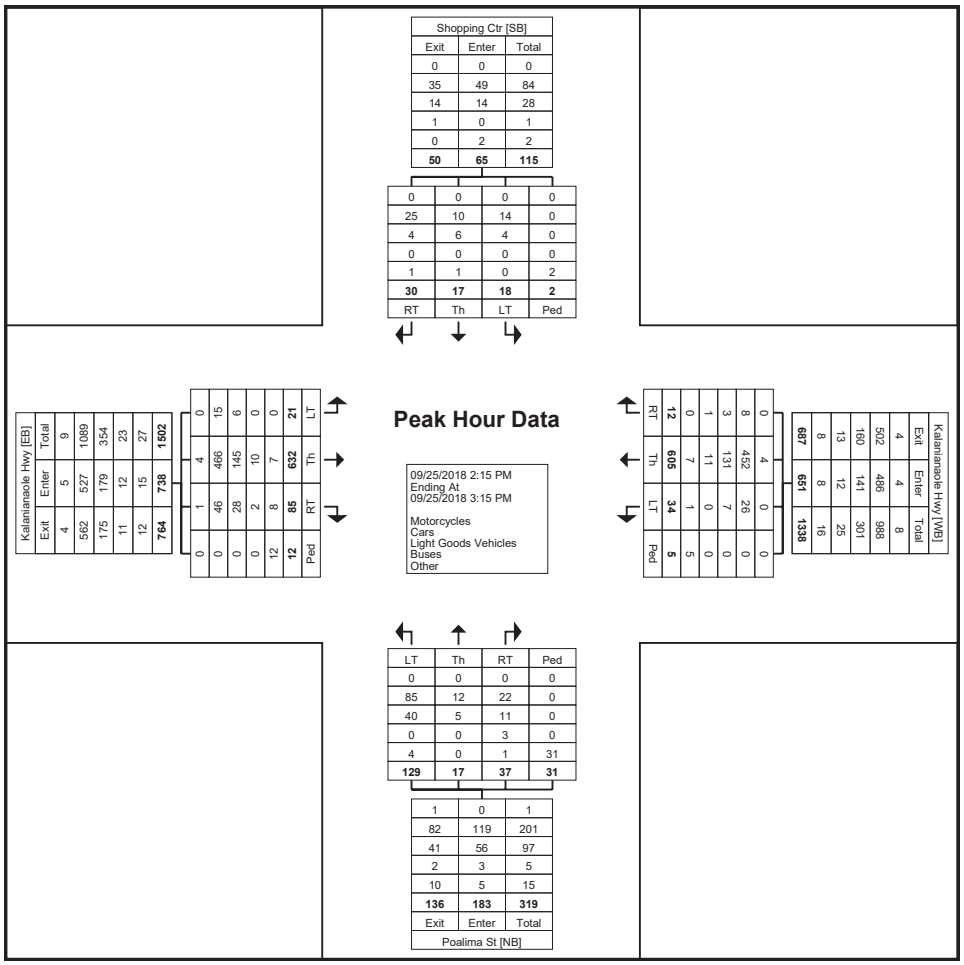

Turning Movement Peak Hour Data Plot (2:15 PM)

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Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018

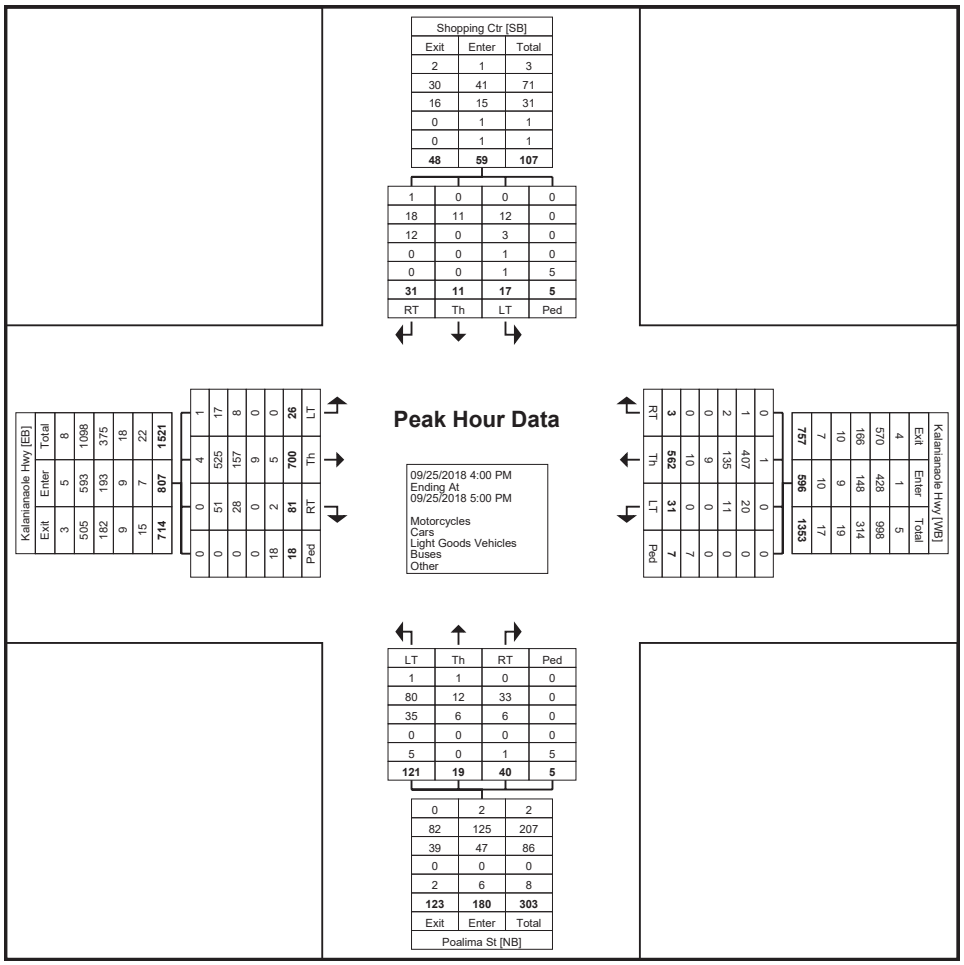
Turning Movement Peak Hour Data (4:00 PM)

Start Time	Kalanianaole Hwy Eastbound					Kalanianaole Hwy Westbound					Poalima St Northbound					Shopping Ctr Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
4:00 PM	7	170	21	1	198	10	126	0	0	136	34	7	7	0	48	2	3	7	0	12	394
4:15 PM	7	179	26	6	212	9	141	0	1	150	20	0	11	2	31	7	3	8	0	18	411
4:30 PM	6	175	20	4	201	10	145	1	6	156	37	5	8	2	50	3	3	8	2	14	421
4:45 PM	6	176	14	7	196	2	150	2	0	154	30	7	14	1	51	5	2	8	3	15	416
Total	26	700	81	18	807	31	562	3	7	596	121	19	40	5	180	17	11	31	5	59	1642
Approach %	3.2	86.7	10.0	-	-	5.2	94.3	0.5	-	-	67.2	10.6	22.2	-	-	28.8	18.6	52.5	-	-	-
Total %	1.6	42.6	4.9	-	49.1	1.9	34.2	0.2	-	36.3	7.4	1.2	2.4	-	11.0	1.0	0.7	1.9	-	3.6	-
PHF	0.929	0.978	0.779	-	0.952	0.775	0.937	0.375	-	0.955	0.818	0.679	0.714	-	0.882	0.607	0.917	0.969	-	0.819	0.975
Motorcycles	1	4	0	-	5	0	1	0	-	1	1	1	0	-	2	0	0	1	-	1	9
% Motorcycles	3.8	0.6	0.0	-	0.6	0.0	0.2	0.0	-	0.2	0.8	5.3	0.0	-	1.1	0.0	0.0	3.2	-	1.7	0.5
Cars	17	525	51	-	593	20	407	1	-	428	80	12	33	-	125	12	11	18	-	41	1187
% Cars	65.4	75.0	63.0	-	73.5	64.5	72.4	33.3	-	71.8	66.1	63.2	82.5	-	69.4	70.6	100.0	58.1	-	69.5	72.3
Light Goods Vehicles	8	157	28	-	193	11	135	2	-	148	35	6	6	-	47	3	0	12	-	15	403
% Light Goods Vehicles	30.8	22.4	34.6	-	23.9	35.5	24.0	66.7	-	24.8	28.9	31.6	15.0	-	26.1	17.6	0.0	38.7	-	25.4	24.5
Buses	0	9	0	-	9	0	9	0	-	9	0	0	0	-	0	1	0	0	-	1	19
% Buses	0.0	1.3	0.0	-	1.1	0.0	1.6	0.0	-	1.5	0.0	0.0	0.0	-	0.0	5.9	0.0	0.0	-	1.7	1.2
Single-Unit Trucks	0	5	1	-	6	0	6	0	-	6	5	0	1	-	6	1	0	0	-	1	19
% Single-Unit Trucks	0.0	0.7	1.2	-	0.7	0.0	1.1	0.0	-	1.0	4.1	0.0	2.5	-	3.3	5.9	0.0	0.0	-	1.7	1.2
Articulated Trucks	0	0	1	-	1	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.0	1.2	-	0.1	0.0	0.2	0.0	-	0.2	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	3	0	-	3	0	0	0	-	0	0	0	0	-	0	3
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.5	0.0	-	0.5	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	1	-	-	-	-	2	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	5.6	-	-	-	-	14.3	-	-	-	-	40.0	-	-	-	-	20.0	-	-
Pedestrians	-	-	-	17	-	-	-	-	6	-	-	-	-	3	-	-	-	-	4	-	-
% Pedestrians	-	-	-	94.4	-	-	-	-	85.7	-	-	-	-	60.0	-	-	-	-	80.0	-	-

The Traffic Management Consultant
1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (4:00 PM)

The Traffic Management Consultant
1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Kalanianaole Hwy Eastbound					Kalanianaole Hwy Westbound					Poalima St Northbound					Shopping Ctr Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:00 AM	6	103	23	6	132	7	166	3	4	176	34	5	13	0	52	3	5	8	1	16	376
7:15 AM	5	154	15	2	174	7	163	4	2	174	40	7	10	14	57	8	3	3	3	14	419
7:30 AM	7	170	21	4	198	7	158	7	2	172	41	7	22	6	70	4	6	7	0	17	457
7:45 AM	6	166	25	8	197	15	177	3	1	195	38	4	19	4	61	7	7	3	3	17	470
Total	24	593	84	20	701	36	664	17	9	717	153	23	64	24	240	22	21	21	7	64	1722
Approach %	3.4	84.6	12.0	-	-	5.0	92.6	2.4	-	-	63.8	9.6	26.7	-	-	34.4	32.8	32.8	-	-	-
Total %	1.4	34.4	4.9	-	40.7	2.1	38.6	1.0	-	41.6	8.9	1.3	3.7	-	13.9	1.3	1.2	1.2	-	3.7	-
PHF	0.857	0.872	0.840	-	0.885	0.600	0.938	0.607	-	0.919	0.933	0.821	0.727	-	0.857	0.688	0.750	0.656	-	0.941	0.916
Motorcycles	0	1	1	-	2	1	0	0	-	1	1	0	1	-	2	1	0	0	-	1	6
% Motorcycles	0.0	0.2	1.2	-	0.3	2.8	0.0	0.0	-	0.1	0.7	0.0	1.6	-	0.8	4.5	0.0	0.0	-	1.6	0.3
Cars	18	444	45	-	507	27	497	14	-	538	120	15	53	-	188	15	17	18	-	50	1283
% Cars	75.0	74.9	53.6	-	72.3	75.0	74.8	82.4	-	75.0	78.4	65.2	82.8	-	78.3	68.2	81.0	85.7	-	78.1	74.5
Light Goods Vehicles	6	132	36	-	174	6	149	3	-	158	23	4	9	-	36	6	3	1	-	10	378
% Light Goods Vehicles	25.0	22.3	42.9	-	24.8	16.7	22.4	17.6	-	22.0	15.0	17.4	14.1	-	15.0	27.3	14.3	4.8	-	15.6	22.0
Buses	0	6	0	-	6	0	7	0	-	7	0	0	1	-	1	0	0	0	-	0	14
% Buses	0.0	1.0	0.0	-	0.9	0.0	1.1	0.0	-	1.0	0.0	0.0	1.6	-	0.4	0.0	0.0	0.0	-	0.0	0.8
Single-Unit Trucks	0	9	0	-	9	2	9	0	-	11	9	3	0	-	12	0	1	2	-	3	35
% Single-Unit Trucks	0.0	1.5	0.0	-	1.3	5.6	1.4	0.0	-	1.5	5.9	13.0	0.0	-	5.0	0.0	4.8	9.5	-	4.7	2.0
Articulated Trucks	0	1	1	-	2	0	1	0	-	1	0	1	0	-	1	0	0	0	-	0	4
% Articulated Trucks	0.0	0.2	1.2	-	0.3	0.0	0.2	0.0	-	0.1	0.0	4.3	0.0	-	0.4	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Road	0	0	1	-	1	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	1.2	-	0.1	0.0	0.2	0.0	-	0.1	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	2	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	10.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	18	-	-	-	-	9	-	-	-	-	24	-	-	-	-	7	-	-
% Pedestrians	-	-	-	90.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

The Traffic Management Consultant
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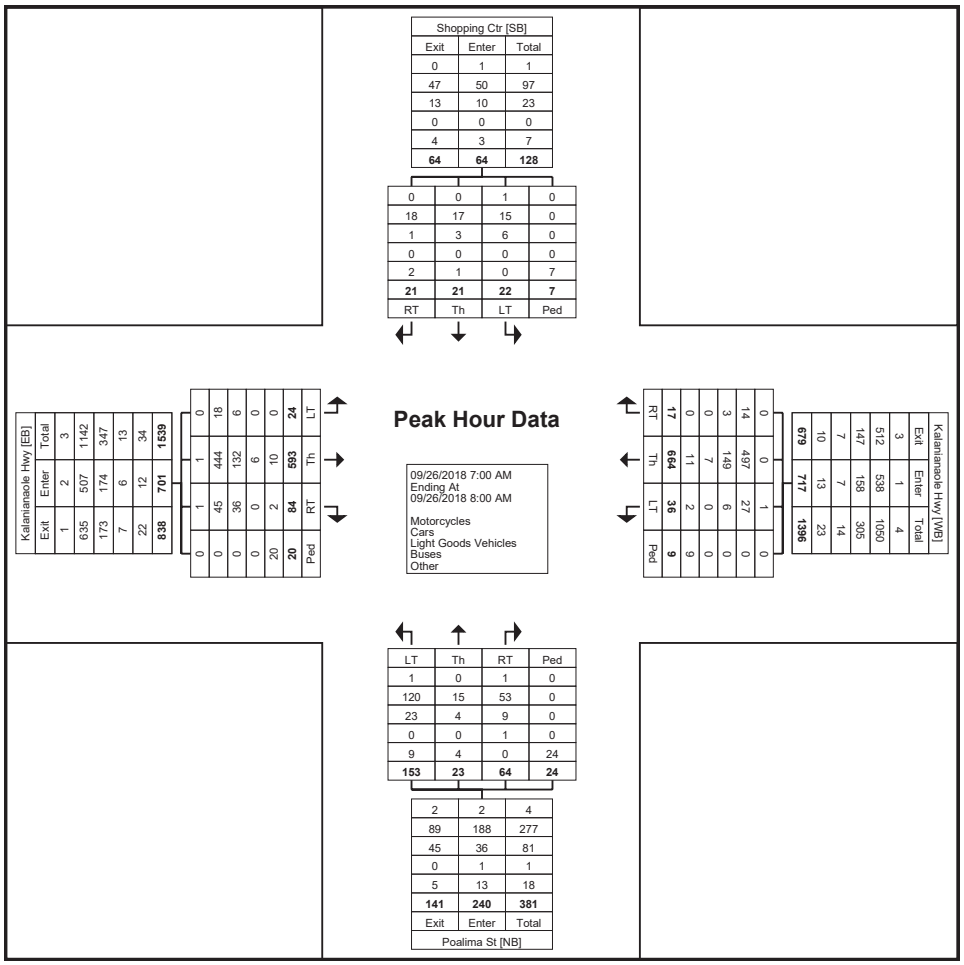
Count Name: Poalima St Kalanianaole Hwy 9-24 to 26-18
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (7:00 AM)

The Traffic Management Consultant
1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Data

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Ahiki St Northbound					Park Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
2:00 PM	5	20	3	0	28	2	25	1	0	28	2	2	2	0	6	3	2	6	1	11	73
2:15 PM	4	26	1	0	31	2	44	8	0	54	4	0	4	0	8	7	1	11	0	19	112
2:30 PM	8	17	1	0	26	3	45	4	1	52	4	1	9	0	14	7	2	15	1	24	116
2:45 PM	7	32	2	0	41	3	29	2	0	34	2	1	6	0	9	2	1	9	2	12	96
Hourly Total	24	95	7	0	126	10	143	15	1	168	12	4	21	0	37	19	6	41	4	66	397
3:00 PM	3	21	2	0	26	3	18	3	0	24	2	0	7	0	9	1	0	9	0	10	69
3:15 PM	5	21	2	1	28	4	13	0	0	17	6	0	9	0	15	1	1	6	0	8	68
3:30 PM	12	26	4	0	42	6	28	4	0	38	5	0	8	0	13	4	0	3	0	7	100
3:45 PM	7	30	1	0	38	6	36	2	2	44	4	0	5	0	9	4	0	6	0	10	101
Hourly Total	27	98	9	1	134	19	95	9	2	123	17	0	29	0	46	10	1	24	0	35	338
4:00 PM	0	25	3	0	28	7	22	4	0	33	5	1	5	0	11	6	1	3	0	10	82
4:15 PM	2	32	4	0	38	7	17	6	0	30	0	0	4	0	4	0	0	1	0	1	73
4:30 PM	3	27	4	0	34	1	27	6	0	34	5	0	6	0	11	1	1	3	1	5	84
4:45 PM	5	27	4	0	36	4	23	7	0	34	3	1	10	0	14	3	0	6	0	9	93
Hourly Total	10	111	15	0	136	19	89	23	0	131	13	2	25	0	40	10	2	13	1	25	332
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 PM	0	17	3	0	20	0	21	0	0	21	0	0	4	0	4	1	0	1	0	2	47
2:15 PM	2	17	4	0	23	1	19	1	0	21	2	0	6	0	8	1	2	3	0	6	58
2:30 PM	0	20	4	0	24	7	19	1	1	27	4	1	7	0	12	1	0	0	0	1	64
2:45 PM	1	21	0	0	22	3	25	0	0	28	5	0	2	0	7	1	0	0	0	1	58
Hourly Total	3	75	11	0	89	11	84	2	1	97	11	1	19	0	31	4	2	4	0	10	227
3:00 PM	2	19	1	0	22	2	20	0	0	22	4	0	2	0	6	1	0	1	0	2	52
3:15 PM	6	21	3	0	30	3	15	1	0	19	4	0	4	0	8	2	0	0	0	2	59
3:30 PM	4	9	2	0	15	6	19	4	0	29	3	0	6	0	9	1	0	4	0	5	58
3:45 PM	2	27	0	0	29	2	24	3	1	29	3	0	6	0	9	4	0	4	0	8	75
Hourly Total	14	76	6	0	96	13	78	8	1	99	14	0	18	0	32	8	0	9	0	17	244
4:00 PM	7	28	2	0	37	2	21	2	0	25	0	0	9	0	9	1	1	2	0	4	75
4:15 PM	3	18	2	0	23	3	23	1	0	27	1	2	4	0	7	4	0	2	0	6	63
4:30 PM	5	24	4	0	33	3	21	4	0	28	0	1	2	0	3	2	3	2	0	7	71
4:45 PM	6	18	3	0	27	4	9	5	0	18	4	1	4	0	9	1	1	8	0	10	64
Hourly Total	21	88	11	0	120	12	74	12	0	98	5	4	19	0	28	8	5	14	0	27	273
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:30 AM	2	7	3	0	12	4	8	0	0	12	0	0	3	0	3	0	0	1	0	1	28
6:45 AM	0	15	1	0	16	2	20	0	0	22	1	1	2	0	4	2	0	0	0	2	44
Hourly Total	2	22	4	0	28	6	28	0	0	34	1	1	5	0	7	2	0	1	0	3	72
7:00 AM	1	11	1	0	13	2	23	0	0	25	4	0	1	0	5	0	0	0	0	0	43
7:15 AM	2	28	4	0	34	2	46	0	0	48	0	1	6	0	7	2	1	0	0	3	92
7:30 AM	1	29	2	0	32	4	53	1	0	58	2	0	3	0	5	0	0	0	0	0	95
7:45 AM	2	25	5	0	32	3	39	2	0	44	4	0	5	0	9	0	0	1	0	1	86
Hourly Total	6	93	12	0	111	11	161	3	0	175	10	1	15	0	26	2	1	1	0	4	316
8:00 AM	1	17	1	0	19	4	31	0	0	35	1	0	5	0	6	0	0	2	0	2	62

8:15 AM	2	16	6	0	24	2	21	2	0	25	0	0	4	0	4	3	0	2	1	5	58
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	3	33	7	0	43	6	52	2	0	60	1	0	9	0	10	3	0	4	1	7	120
2:00 PM	4	20	2	0	26	4	28	2	0	34	4	1	6	0	11	0	0	4	0	4	75
2:15 PM	2	27	3	0	32	3	27	4	0	34	1	0	4	0	5	2	0	4	0	6	77
2:30 PM	2	21	3	0	26	3	44	0	0	47	5	0	3	0	8	1	0	1	0	2	83
2:45 PM	2	19	3	0	24	3	35	3	0	41	3	1	6	0	10	2	0	3	0	5	80
Hourly Total	10	87	11	0	108	13	134	9	0	156	13	2	19	0	34	5	0	12	0	17	315
3:00 PM	0	14	3	0	17	0	15	1	0	16	5	0	3	0	8	1	1	2	0	4	45
3:15 PM	2	20	1	0	23	4	16	1	0	21	1	0	3	0	4	0	0	0	0	0	48
3:30 PM	1	16	2	0	19	2	17	0	0	19	0	0	3	0	3	1	0	1	0	2	43
3:45 PM	4	28	1	0	33	3	23	2	0	28	1	0	8	0	9	2	0	0	0	2	72
Hourly Total	7	78	7	0	92	9	71	4	0	84	7	0	17	0	24	4	1	3	0	8	208
4:00 PM	0	13	2	0	15	4	19	0	0	23	2	1	7	0	10	2	0	2	0	4	52
4:15 PM	1	11	2	0	14	2	16	1	0	19	0	2	7	0	9	1	1	2	1	4	46
4:30 PM	4	17	2	0	23	6	19	2	0	27	1	1	1	0	3	0	0	3	0	3	56
4:45 PM	2	19	1	0	22	2	18	3	0	23	0	0	6	0	6	4	0	4	0	8	59
Hourly Total	7	60	7	0	74	14	72	6	0	92	3	4	21	0	28	7	1	11	1	19	213
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:30 AM	2	3	1	0	6	1	11	1	0	13	4	0	1	0	5	1	0	0	1	1	25
6:45 AM	2	14	1	1	17	4	20	0	0	24	2	0	2	0	4	0	0	1	0	1	46
Hourly Total	4	17	2	1	23	5	31	1	0	37	6	0	3	0	9	1	0	1	1	2	71
7:00 AM	2	12	7	0	21	0	18	1	0	19	3	0	3	0	6	0	0	3	0	3	49
7:15 AM	0	28	1	0	29	3	48	0	0	51	0	1	0	0	1	1	0	3	0	4	85
7:30 AM	3	28	2	0	33	6	60	2	0	68	1	0	3	0	4	0	0	0	0	0	105
7:45 AM	2	25	1	0	28	4	37	0	0	41	1	0	3	0	4	3	0	1	0	4	77
Hourly Total	7	93	11	0	111	13	163	3	0	179	5	1	9	0	15	4	0	7	0	11	316
8:00 AM	2	17	2	0	21	1	23	1	0	25	0	0	4	0	4	0	0	1	0	1	51
8:15 AM	2	14	4	0	20	2	24	1	0	27	1	0	5	0	6	0	0	2	0	2	55
Grand Total	149	1057	126	2	1332	164	1322	99	5	1585	119	20	238	0	377	87	19	148	8	254	3548
Approach %	11.2	79.4	9.5	-	-	10.3	83.4	6.2	-	-	31.6	5.3	63.1	-	-	34.3	7.5	58.3	-	-	-
Total %	4.2	29.8	3.6	-	37.5	4.6	37.3	2.8	-	44.7	3.4	0.6	6.7	-	10.6	2.5	0.5	4.2	-	7.2	-
Motorcycles	1	5	1	-	7	1	9	2	-	12	0	0	4	-	4	2	0	1	-	3	26
% Motorcycles	0.7	0.5	0.8	-	0.5	0.6	0.7	2.0	-	0.8	0.0	0.0	1.7	-	1.1	2.3	0.0	0.7	-	1.2	0.7
Cars	94	602	81	-	777	94	828	59	-	981	60	11	115	-	186	46	7	107	-	160	2104
% Cars	63.1	57.0	64.3	-	58.3	57.3	62.6	59.6	-	61.9	50.4	55.0	48.3	-	49.3	52.9	36.8	72.3	-	63.0	59.3
Light Goods Vehicles	42	378	44	-	464	60	427	24	-	511	57	7	101	-	165	32	6	28	-	66	1206
% Light Goods Vehicles	28.2	35.8	34.9	-	34.8	36.6	32.3	24.2	-	32.2	47.9	35.0	42.4	-	43.8	36.8	31.6	18.9	-	26.0	34.0
Buses	2	14	0	-	16	0	7	0	-	7	0	0	0	-	0	0	1	1	-	2	25
% Buses	1.3	1.3	0.0	-	1.2	0.0	0.5	0.0	-	0.4	0.0	0.0	0.0	-	0.0	0.0	5.3	0.7	-	0.8	0.7
Single-Unit Trucks	2	39	0	-	41	9	34	0	-	43	2	0	11	-	13	0	0	1	-	1	98
% Single-Unit Trucks	1.3	3.7	0.0	-	3.1	5.5	2.6	0.0	-	2.7	1.7	0.0	4.6	-	3.4	0.0	0.0	0.7	-	0.4	2.8
Articulated Trucks	0	8	0	-	8	0	7	0	-	7	0	0	0	-	0	0	0	0	-	0	15
% Articulated Trucks	0.0	0.8	0.0	-	0.6	0.0	0.5	0.0	-	0.4	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.4
Bicycles on Road	8	11	0	-	19	0	10	14	-	24	0	2	7	-	9	7	5	10	-	22	74
% Bicycles on Road	5.4	1.0	0.0	-	1.4	0.0	0.8	14.1	-	1.5	0.0	10.0	2.9	-	2.4	8.0	26.3	6.8	-	8.7	2.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	12.5	-	-
Pedestrians	-	-	-	2	-	-	-	-	5	-	-	-	-	0	-	-	-	-	7	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	87.5	-	-

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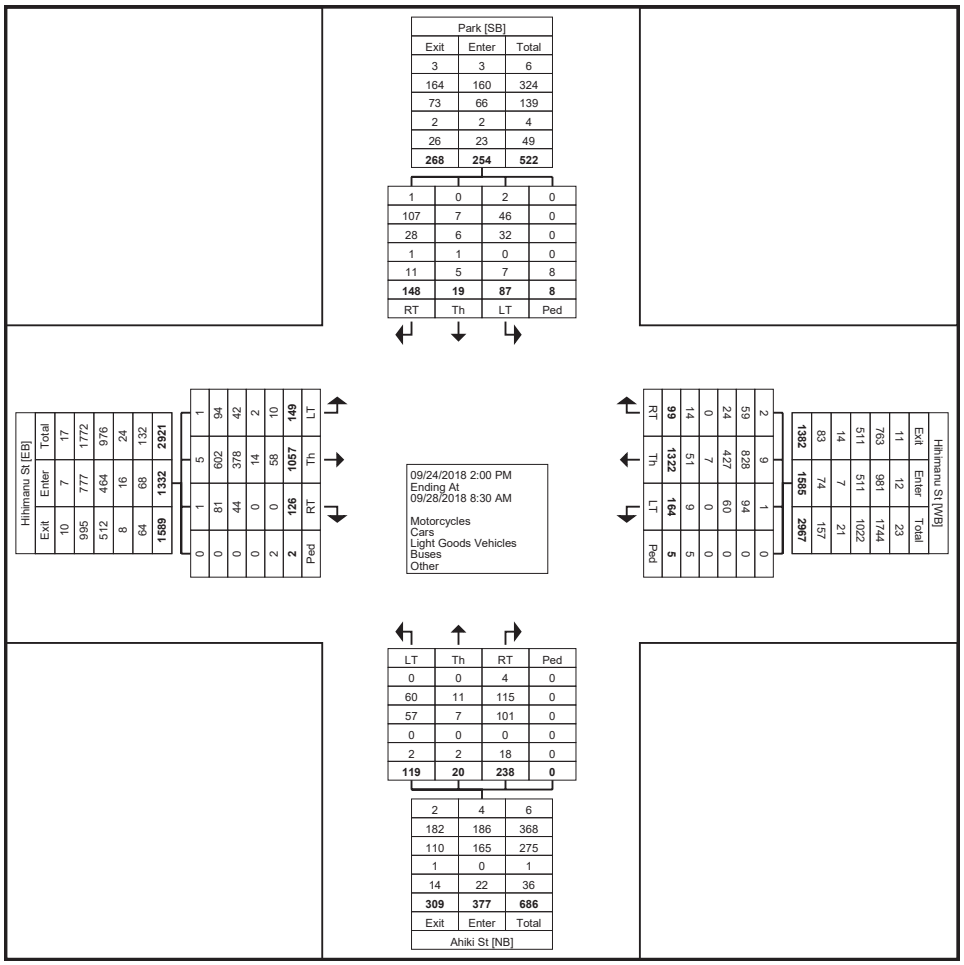
Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Data Plot

The Traffic Management Consultant
1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (2:15 PM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Ahiki St Northbound					Park Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
2:15 PM	4	26	1	0	31	2	44	8	0	54	4	0	4	0	8	7	1	11	0	19	112
2:30 PM	8	17	1	0	26	3	45	4	1	52	4	1	9	0	14	7	2	15	1	24	116
2:45 PM	7	32	2	0	41	3	29	2	0	34	2	1	6	0	9	2	1	9	2	12	96
3:00 PM	3	21	2	0	26	3	18	3	0	24	2	0	7	0	9	1	0	9	0	10	69
Total	22	96	6	0	124	11	136	17	1	164	12	2	26	0	40	17	4	44	3	65	393
Approach %	17.7	77.4	4.8	-	-	6.7	82.9	10.4	-	-	30.0	5.0	65.0	-	-	26.2	6.2	67.7	-	-	-
Total %	5.6	24.4	1.5	-	31.6	2.8	34.6	4.3	-	41.7	3.1	0.5	6.6	-	10.2	4.3	1.0	11.2	-	16.5	-
PHF	0.688	0.750	0.750	-	0.756	0.917	0.756	0.531	-	0.759	0.750	0.500	0.722	-	0.714	0.607	0.500	0.733	-	0.677	0.847
Motorcycles	1	0	0	-	1	1	1	0	-	2	0	0	0	-	0	0	0	1	-	1	4
% Motorcycles	4.5	0.0	0.0	-	0.8	9.1	0.7	0.0	-	1.2	0.0	0.0	0.0	-	0.0	0.0	0.0	2.3	-	1.5	1.0
Cars	17	65	3	-	85	7	84	10	-	101	5	1	10	-	16	10	2	32	-	44	246
% Cars	77.3	67.7	50.0	-	68.5	63.6	61.8	58.8	-	61.6	41.7	50.0	38.5	-	40.0	58.8	50.0	72.7	-	67.7	62.6
Light Goods Vehicles	3	22	3	-	28	2	42	7	-	51	7	1	14	-	22	6	2	10	-	18	119
% Light Goods Vehicles	13.6	22.9	50.0	-	22.6	18.2	30.9	41.2	-	31.1	58.3	50.0	53.8	-	55.0	35.3	50.0	22.7	-	27.7	30.3
Buses	1	2	0	-	3	0	2	0	-	2	0	0	0	-	0	0	0	1	-	1	6
% Buses	4.5	2.1	0.0	-	2.4	0.0	1.5	0.0	-	1.2	0.0	0.0	0.0	-	0.0	0.0	0.0	2.3	-	1.5	1.5
Single-Unit Trucks	0	6	0	-	6	1	7	0	-	8	0	0	2	-	2	0	0	0	-	0	16
% Single-Unit Trucks	0.0	6.3	0.0	-	4.8	9.1	5.1	0.0	-	4.9	0.0	0.0	7.7	-	5.0	0.0	0.0	0.0	-	0.0	4.1
Articulated Trucks	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Articulated Trucks	0.0	1.0	0.0	-	0.8	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	5.9	0.0	0.0	-	1.5	0.3
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	33.3	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	66.7	-	-

The Traffic Management Consultant
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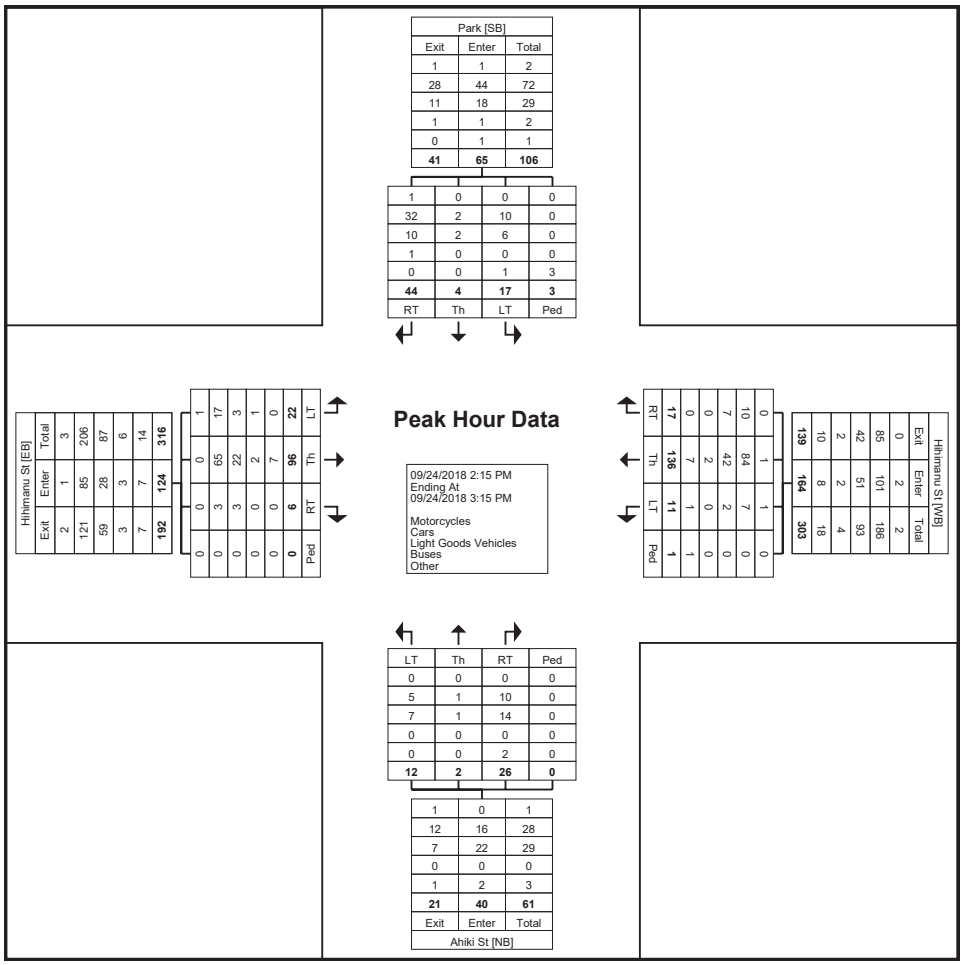
Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (2:15 PM)

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Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (3:30 PM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Ahiki St Northbound					Park Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
3:30 PM	12	26	4	0	42	6	28	4	0	38	5	0	8	0	13	4	0	3	0	7	100
3:45 PM	7	30	1	0	38	6	36	2	2	44	4	0	5	0	9	4	0	6	0	10	101
4:00 PM	0	25	3	0	28	7	22	4	0	33	5	1	5	0	11	6	1	3	0	10	82
4:15 PM	2	32	4	0	38	7	17	6	0	30	0	0	4	0	4	0	0	1	0	1	73
Total	21	113	12	0	146	26	103	16	2	145	14	1	22	0	37	14	1	13	0	28	356
Approach %	14.4	77.4	8.2	-	-	17.9	71.0	11.0	-	-	37.8	2.7	59.5	-	-	50.0	3.6	46.4	-	-	-
Total %	5.9	31.7	3.4	-	41.0	7.3	28.9	4.5	-	40.7	3.9	0.3	6.2	-	10.4	3.9	0.3	3.7	-	7.9	-
PHF	0.438	0.883	0.750	-	0.869	0.929	0.715	0.667	-	0.824	0.700	0.250	0.688	-	0.712	0.583	0.250	0.542	-	0.700	0.881
Motorcycles	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	0	0	0	-	0	2
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	1.9	0.0	-	1.4	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.6
Cars	11	72	10	-	93	17	58	10	-	85	5	0	15	-	20	9	0	12	-	21	219
% Cars	52.4	63.7	83.3	-	63.7	65.4	56.3	62.5	-	58.6	35.7	0.0	68.2	-	54.1	64.3	0.0	92.3	-	75.0	61.5
Light Goods Vehicles	7	35	2	-	44	8	38	4	-	50	9	1	6	-	16	4	1	1	-	6	116
% Light Goods Vehicles	33.3	31.0	16.7	-	30.1	30.8	36.9	25.0	-	34.5	64.3	100.0	27.3	-	43.2	28.6	100.0	7.7	-	21.4	32.6
Buses	0	3	0	-	3	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	4
% Buses	0.0	2.7	0.0	-	2.1	0.0	1.0	0.0	-	0.7	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	1.1
Single-Unit Trucks	0	3	0	-	3	1	4	0	-	5	0	0	0	-	0	0	0	0	-	0	8
% Single-Unit Trucks	0.0	2.7	0.0	-	2.1	3.8	3.9	0.0	-	3.4	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	2.2
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	3	0	0	-	3	0	0	2	-	2	0	0	1	-	1	1	0	0	-	1	7
% Bicycles on Road	14.3	0.0	0.0	-	2.1	0.0	0.0	12.5	-	1.4	0.0	0.0	4.5	-	2.7	7.1	0.0	0.0	-	3.6	2.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

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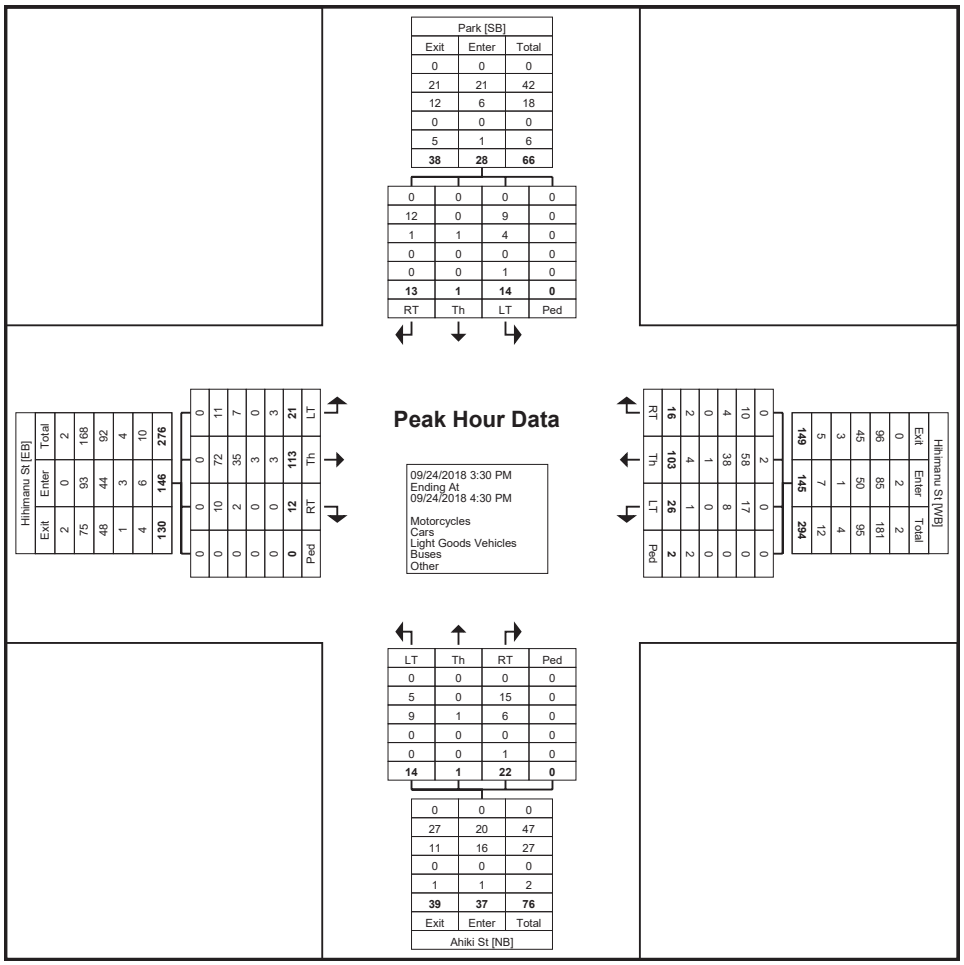
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (3:30 PM)

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Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (2:15 PM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Ahiki St Northbound					Park Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
2:15 PM	2	17	4	0	23	1	19	1	0	21	2	0	6	0	8	1	2	3	0	6	58
2:30 PM	0	20	4	0	24	7	19	1	1	27	4	1	7	0	12	1	0	0	0	1	64
2:45 PM	1	21	0	0	22	3	25	0	0	28	5	0	2	0	7	1	0	0	0	1	58
3:00 PM	2	19	1	0	22	2	20	0	0	22	4	0	2	0	6	1	0	1	0	2	52
Total	5	77	9	0	91	13	83	2	1	98	15	1	17	0	33	4	2	4	0	10	232
Approach %	5.5	84.6	9.9	-	-	13.3	84.7	2.0	-	-	45.5	3.0	51.5	-	-	40.0	20.0	40.0	-	-	-
Total %	2.2	33.2	3.9	-	39.2	5.6	35.8	0.9	-	42.2	6.5	0.4	7.3	-	14.2	1.7	0.9	1.7	-	4.3	-
PHF	0.625	0.917	0.563	-	0.948	0.464	0.830	0.500	-	0.875	0.750	0.250	0.607	-	0.688	1.000	0.250	0.333	-	0.417	0.906
Motorcycles	0	0	0	-	0	0	1	0	-	1	0	0	2	-	2	0	0	0	-	0	3
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	1.2	0.0	-	1.0	0.0	0.0	11.8	-	6.1	0.0	0.0	0.0	-	0.0	1.3
Cars	2	35	4	-	41	7	37	1	-	45	6	1	5	-	12	2	0	3	-	5	103
% Cars	40.0	45.5	44.4	-	45.1	53.8	44.6	50.0	-	45.9	40.0	100.0	29.4	-	36.4	50.0	0.0	75.0	-	50.0	44.4
Light Goods Vehicles	2	30	5	-	37	6	39	0	-	45	9	0	8	-	17	1	0	0	-	1	100
% Light Goods Vehicles	40.0	39.0	55.6	-	40.7	46.2	47.0	0.0	-	45.9	60.0	0.0	47.1	-	51.5	25.0	0.0	0.0	-	10.0	43.1
Buses	1	2	0	-	3	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	3
% Buses	20.0	2.6	0.0	-	3.3	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	1.3
Single-Unit Trucks	0	7	0	-	7	0	3	0	-	3	0	0	0	-	0	0	0	0	-	0	10
% Single-Unit Trucks	0.0	9.1	0.0	-	7.7	0.0	3.6	0.0	-	3.1	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	4.3
Articulated Trucks	0	2	0	-	2	0	2	0	-	2	0	0	0	-	0	0	0	0	-	0	4
% Articulated Trucks	0.0	2.6	0.0	-	2.2	0.0	2.4	0.0	-	2.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	1.7
Bicycles on Road	0	1	0	-	1	0	1	1	-	2	0	0	2	-	2	1	2	1	-	4	9
% Bicycles on Road	0.0	1.3	0.0	-	1.1	0.0	1.2	50.0	-	2.0	0.0	0.0	11.8	-	6.1	25.0	100.0	25.0	-	40.0	3.9
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

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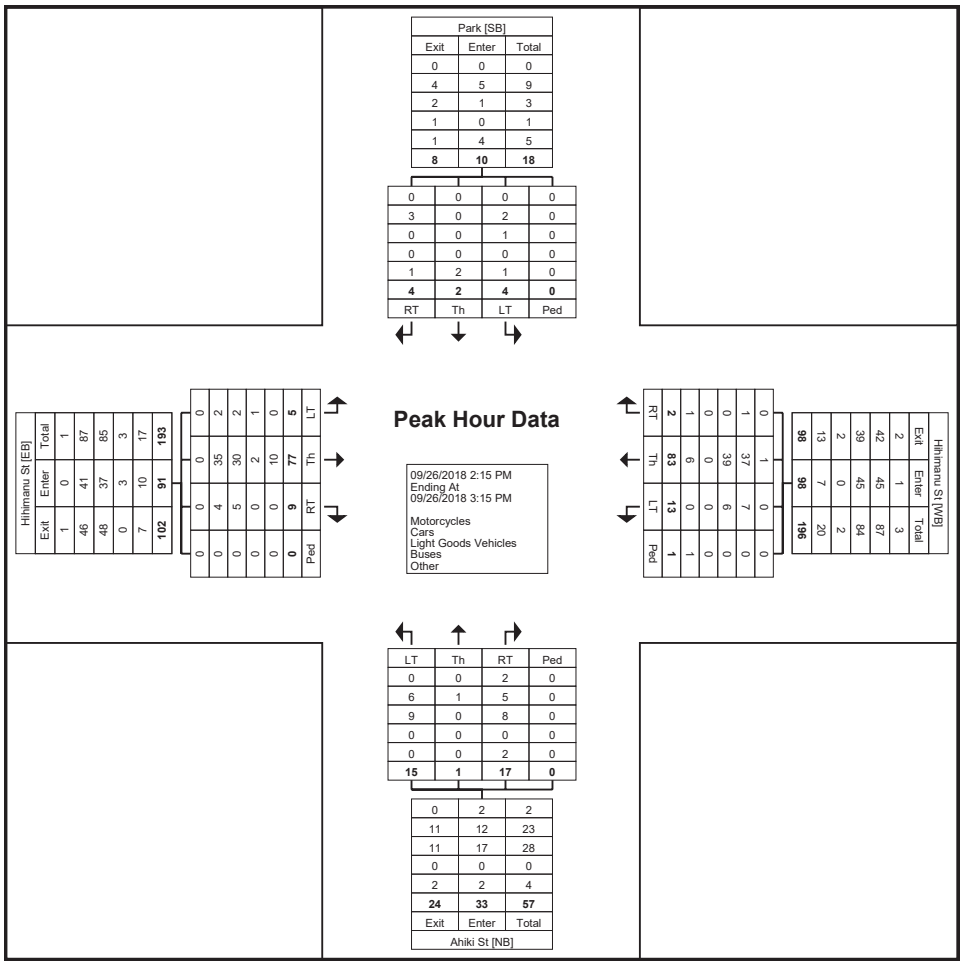
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (2:15 PM)

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Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (3:30 PM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Ahiki St Northbound					Park Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
3:30 PM	4	9	2	0	15	6	19	4	0	29	3	0	6	0	9	1	0	4	0	5	58
3:45 PM	2	27	0	0	29	2	24	3	1	29	3	0	6	0	9	4	0	4	0	8	75
4:00 PM	7	28	2	0	37	2	21	2	0	25	0	0	9	0	9	1	1	2	0	4	75
4:15 PM	3	18	2	0	23	3	23	1	0	27	1	2	4	0	7	4	0	2	0	6	63
Total	16	82	6	0	104	13	87	10	1	110	7	2	25	0	34	10	1	12	0	23	271
Approach %	15.4	78.8	5.8	-	-	11.8	79.1	9.1	-	-	20.6	5.9	73.5	-	-	43.5	4.3	52.2	-	-	-
Total %	5.9	30.3	2.2	-	38.4	4.8	32.1	3.7	-	40.6	2.6	0.7	9.2	-	12.5	3.7	0.4	4.4	-	8.5	-
PHF	0.571	0.732	0.750	-	0.703	0.542	0.906	0.625	-	0.948	0.583	0.250	0.694	-	0.944	0.625	0.250	0.750	-	0.719	0.903
Motorcycles	0	0	0	-	0	0	2	2	-	4	0	0	1	-	1	2	0	0	-	2	7
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	2.3	20.0	-	3.6	0.0	0.0	4.0	-	2.9	20.0	0.0	0.0	-	8.7	2.6
Cars	8	49	3	-	60	9	43	6	-	58	5	1	11	-	17	1	0	11	-	12	147
% Cars	50.0	59.8	50.0	-	57.7	69.2	49.4	60.0	-	52.7	71.4	50.0	44.0	-	50.0	10.0	0.0	91.7	-	52.2	54.2
Light Goods Vehicles	8	31	3	-	42	3	41	1	-	45	2	1	10	-	13	5	0	1	-	6	106
% Light Goods Vehicles	50.0	37.8	50.0	-	40.4	23.1	47.1	10.0	-	40.9	28.6	50.0	40.0	-	38.2	50.0	0.0	8.3	-	26.1	39.1
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Buses	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	100.0	0.0	-	4.3	0.4
Single-Unit Trucks	0	1	0	-	1	1	1	0	-	2	0	0	1	-	1	0	0	0	-	0	4
% Single-Unit Trucks	0.0	1.2	0.0	-	1.0	7.7	1.1	0.0	-	1.8	0.0	0.0	4.0	-	2.9	0.0	0.0	0.0	-	0.0	1.5
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	1	0	-	1	0	0	1	-	1	0	0	2	-	2	2	0	0	-	2	6
% Bicycles on Road	0.0	1.2	0.0	-	1.0	0.0	0.0	10.0	-	0.9	0.0	0.0	8.0	-	5.9	20.0	0.0	0.0	-	8.7	2.2
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

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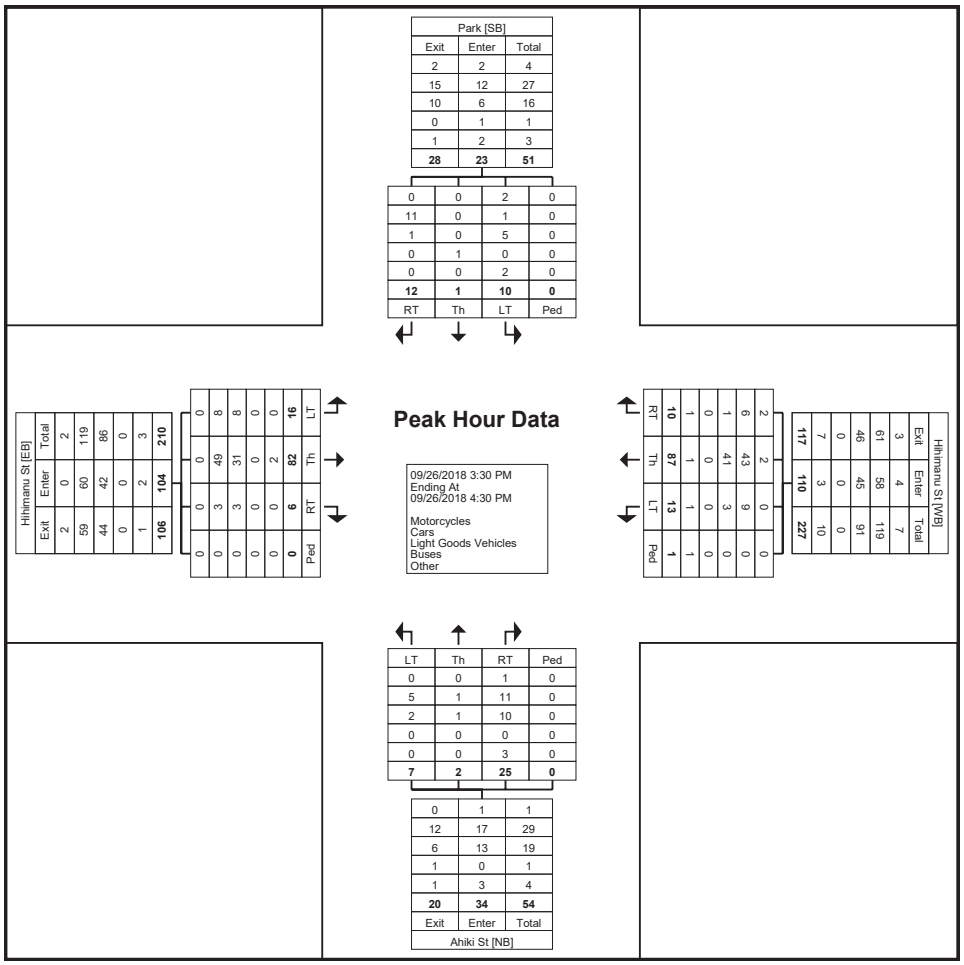

Turning Movement Peak Hour Data Plot (3:30 PM)

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Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Ahiki St Northbound					Park Southbound					Int. Total
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	
7:15 AM	2	28	4	0	34	2	46	0	0	48	0	1	6	0	7	2	1	0	0	3	92
7:30 AM	1	29	2	0	32	4	53	1	0	58	2	0	3	0	5	0	0	0	0	0	95
7:45 AM	2	25	5	0	32	3	39	2	0	44	4	0	5	0	9	0	0	1	0	1	86
8:00 AM	1	17	1	0	19	4	31	0	0	35	1	0	5	0	6	0	0	2	0	2	62
Total	6	99	12	0	117	13	169	3	0	185	7	1	19	0	27	2	1	3	0	6	335
Approach %	5.1	84.6	10.3	-	-	7.0	91.4	1.6	-	-	25.9	3.7	70.4	-	-	33.3	16.7	50.0	-	-	-
Total %	1.8	29.6	3.6	-	34.9	3.9	50.4	0.9	-	55.2	2.1	0.3	5.7	-	8.1	0.6	0.3	0.9	-	1.8	-
PHF	0.750	0.853	0.600	-	0.860	0.813	0.797	0.375	-	0.797	0.438	0.250	0.792	-	0.750	0.250	0.250	0.375	-	0.500	0.882
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars	5	59	5	-	69	6	124	3	-	133	5	1	8	-	14	0	1	3	-	4	220
% Cars	83.3	59.6	41.7	-	59.0	46.2	73.4	100.0	-	71.9	71.4	100.0	42.1	-	51.9	0.0	100.0	100.0	-	66.7	65.7
Light Goods Vehicles	1	33	7	-	41	6	39	0	-	45	2	0	8	-	10	2	0	0	-	2	98
% Light Goods Vehicles	16.7	33.3	58.3	-	35.0	46.2	23.1	0.0	-	24.3	28.6	0.0	42.1	-	37.0	100.0	0.0	0.0	-	33.3	29.3
Buses	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Buses	0.0	1.0	0.0	-	0.9	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.3
Single-Unit Trucks	0	2	0	-	2	1	4	0	-	5	0	0	2	-	2	0	0	0	-	0	9
% Single-Unit Trucks	0.0	2.0	0.0	-	1.7	7.7	2.4	0.0	-	2.7	0.0	0.0	10.5	-	7.4	0.0	0.0	0.0	-	0.0	2.7
Articulated Trucks	0	2	0	-	2	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	3
% Articulated Trucks	0.0	2.0	0.0	-	1.7	0.0	0.6	0.0	-	0.5	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.9
Bicycles on Road	0	2	0	-	2	0	1	0	-	1	0	0	1	-	1	0	0	0	-	0	4
% Bicycles on Road	0.0	2.0	0.0	-	1.7	0.0	0.6	0.0	-	0.5	0.0	0.0	5.3	-	3.7	0.0	0.0	0.0	-	0.0	1.2
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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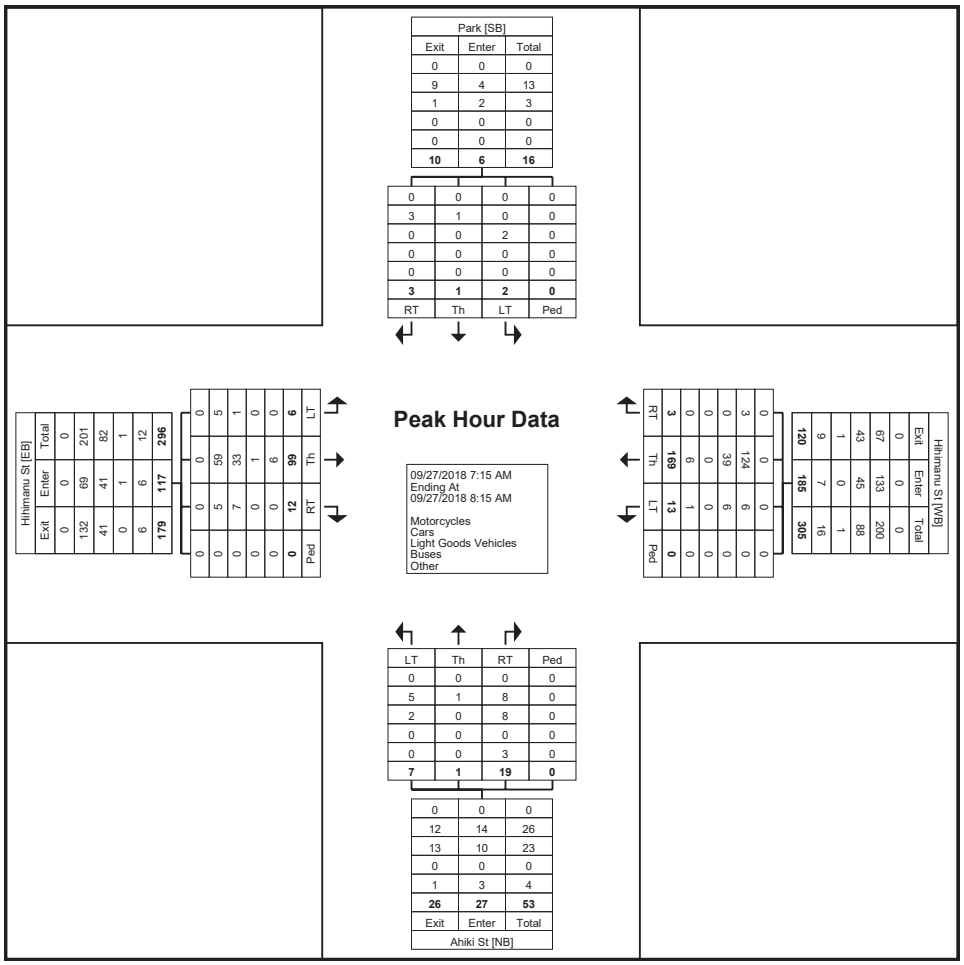

Turning Movement Peak Hour Data Plot (7:15 AM)

The Traffic Management Consultant
1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (2:15 PM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Ahiki St Northbound					Park Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
2:15 PM	2	27	3	0	32	3	27	4	0	34	1	0	4	0	5	2	0	4	0	6	77
2:30 PM	2	21	3	0	26	3	44	0	0	47	5	0	3	0	8	1	0	1	0	2	83
2:45 PM	2	19	3	0	24	3	35	3	0	41	3	1	6	0	10	2	0	3	0	5	80
3:00 PM	0	14	3	0	17	0	15	1	0	16	5	0	3	0	8	1	1	2	0	4	45
Total	6	81	12	0	99	9	121	8	0	138	14	1	16	0	31	6	1	10	0	17	285
Approach %	6.1	81.8	12.1	-	-	6.5	87.7	5.8	-	-	45.2	3.2	51.6	-	-	35.3	5.9	58.8	-	-	-
Total %	2.1	28.4	4.2	-	34.7	3.2	42.5	2.8	-	48.4	4.9	0.4	5.6	-	10.9	2.1	0.4	3.5	-	6.0	-
PHF	0.750	0.750	1.000	-	0.773	0.750	0.688	0.500	-	0.734	0.700	0.250	0.667	-	0.775	0.750	0.250	0.625	-	0.708	0.858
Motorcycles	0	1	0	-	1	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	2
% Motorcycles	0.0	1.2	0.0	-	1.0	0.0	0.8	0.0	-	0.7	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.7
Cars	3	47	7	-	57	4	68	5	-	77	3	0	5	-	8	4	0	4	-	8	150
% Cars	50.0	58.0	58.3	-	57.6	44.4	56.2	62.5	-	55.8	21.4	0.0	31.3	-	25.8	66.7	0.0	40.0	-	47.1	52.6
Light Goods Vehicles	2	26	5	-	33	4	47	3	-	54	10	1	10	-	21	2	1	4	-	7	115
% Light Goods Vehicles	33.3	32.1	41.7	-	33.3	44.4	38.8	37.5	-	39.1	71.4	100.0	62.5	-	67.7	33.3	100.0	40.0	-	41.2	40.4
Buses	0	1	0	-	1	0	2	0	-	2	0	0	0	-	0	0	0	0	-	0	3
% Buses	0.0	1.2	0.0	-	1.0	0.0	1.7	0.0	-	1.4	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	1.1
Single-Unit Trucks	1	4	0	-	5	1	2	0	-	3	1	0	0	-	1	0	0	1	-	1	10
% Single-Unit Trucks	16.7	4.9	0.0	-	5.1	11.1	1.7	0.0	-	2.2	7.1	0.0	0.0	-	3.2	0.0	0.0	10.0	-	5.9	3.5
Articulated Trucks	0	2	0	-	2	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	3
% Articulated Trucks	0.0	2.5	0.0	-	2.0	0.0	0.8	0.0	-	0.7	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	1.1
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	1	-	1	0	0	1	-	1	2
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	6.3	-	3.2	0.0	0.0	10.0	-	5.9	0.7
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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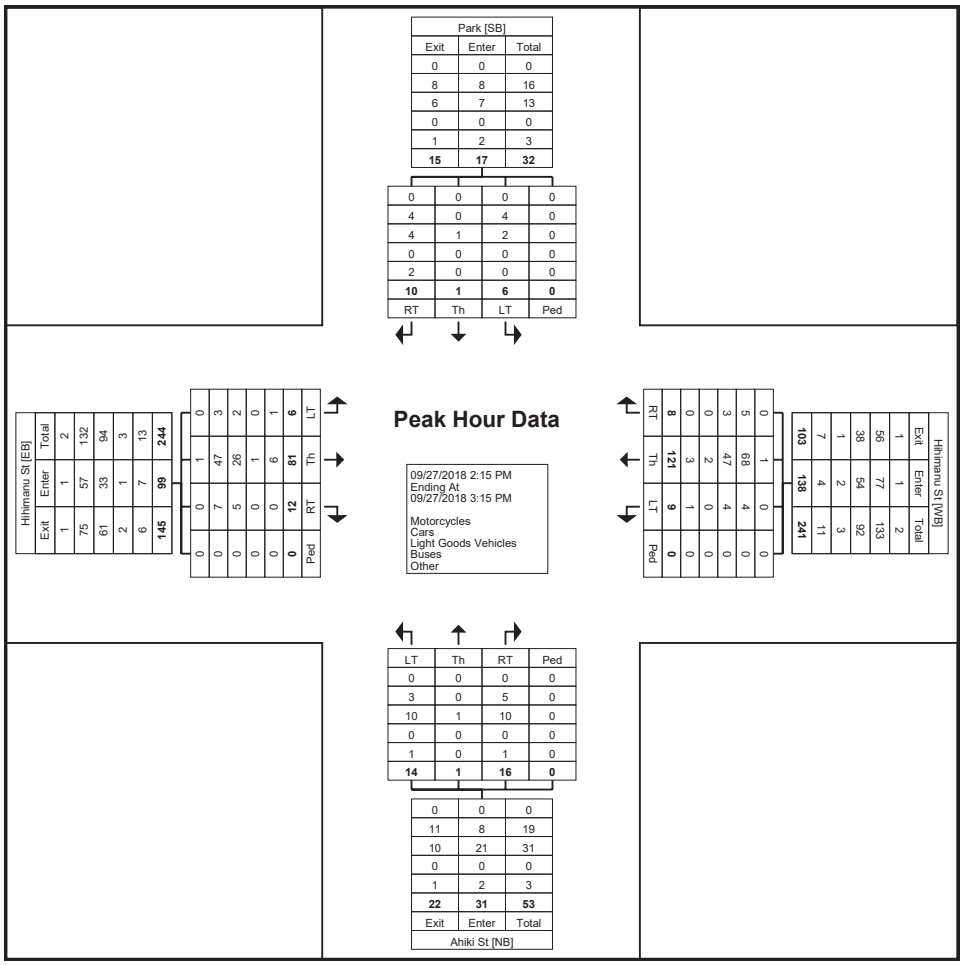

Turning Movement Peak Hour Data Plot (2:15 PM)

The Traffic Management Consultant
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Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (3:30 PM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Ahiki St Northbound					Park Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
3:30 PM	1	16	2	0	19	2	17	0	0	19	0	0	3	0	3	1	0	1	0	2	43
3:45 PM	4	28	1	0	33	3	23	2	0	28	1	0	8	0	9	2	0	0	0	2	72
4:00 PM	0	13	2	0	15	4	19	0	0	23	2	1	7	0	10	2	0	2	0	4	52
4:15 PM	1	11	2	0	14	2	16	1	0	19	0	2	7	0	9	1	1	2	1	4	46
Total	6	68	7	0	81	11	75	3	0	89	3	3	25	0	31	6	1	5	1	12	213
Approach %	7.4	84.0	8.6	-	-	12.4	84.3	3.4	-	-	9.7	9.7	80.6	-	-	50.0	8.3	41.7	-	-	-
Total %	2.8	31.9	3.3	-	38.0	5.2	35.2	1.4	-	41.8	1.4	1.4	11.7	-	14.6	2.8	0.5	2.3	-	5.6	-
PHF	0.375	0.607	0.875	-	0.614	0.688	0.815	0.375	-	0.795	0.375	0.375	0.781	-	0.775	0.750	0.250	0.625	-	0.750	0.740
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars	4	31	4	-	39	8	34	2	-	44	2	2	13	-	17	3	1	4	-	8	108
% Cars	66.7	45.6	57.1	-	48.1	72.7	45.3	66.7	-	49.4	66.7	66.7	52.0	-	54.8	50.0	100.0	80.0	-	66.7	50.7
Light Goods Vehicles	2	34	3	-	39	3	37	1	-	41	1	0	11	-	12	3	0	0	-	3	95
% Light Goods Vehicles	33.3	50.0	42.9	-	48.1	27.3	49.3	33.3	-	46.1	33.3	0.0	44.0	-	38.7	50.0	0.0	0.0	-	25.0	44.6
Buses	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Buses	0.0	1.5	0.0	-	1.2	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.5
Single-Unit Trucks	0	1	0	-	1	0	1	0	-	1	0	0	1	-	1	0	0	0	-	0	3
% Single-Unit Trucks	0.0	1.5	0.0	-	1.2	0.0	1.3	0.0	-	1.1	0.0	0.0	4.0	-	3.2	0.0	0.0	0.0	-	0.0	1.4
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	1	0	-	1	0	3	0	-	3	0	1	0	-	1	0	0	1	-	1	6
% Bicycles on Road	0.0	1.5	0.0	-	1.2	0.0	4.0	0.0	-	3.4	0.0	33.3	0.0	-	3.2	0.0	0.0	20.0	-	8.3	2.8
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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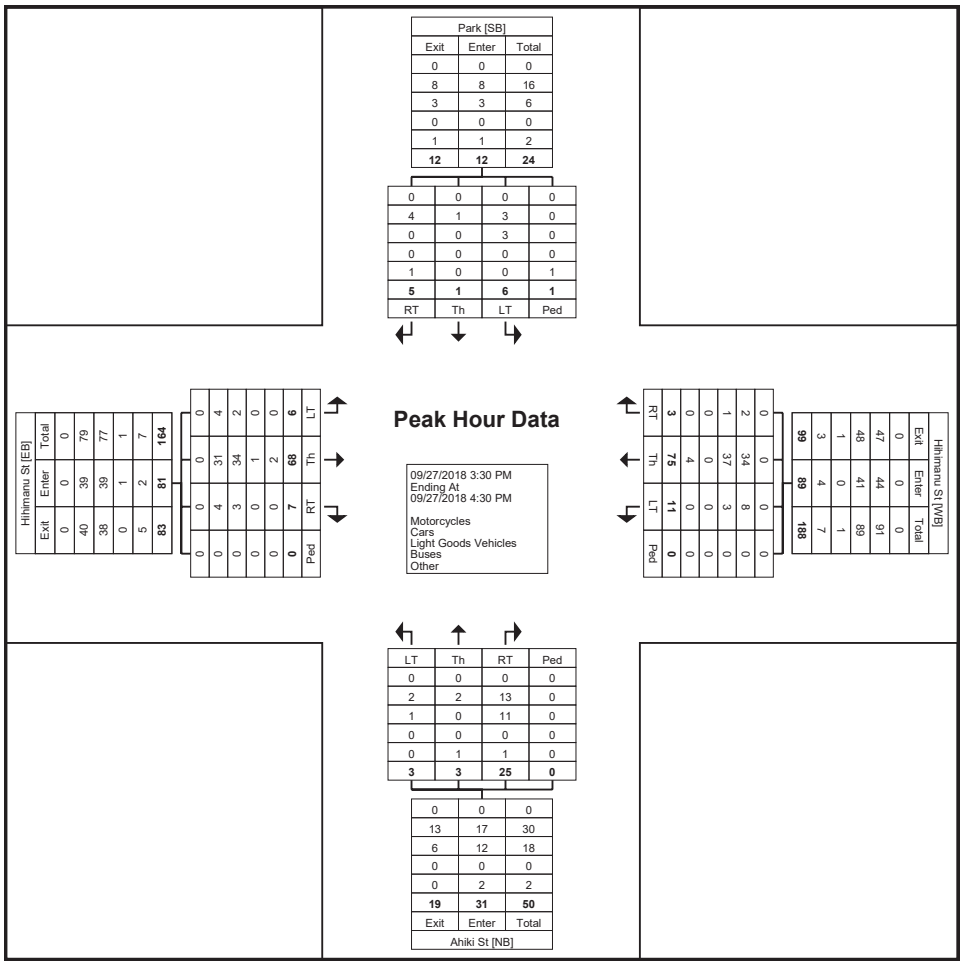
Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (3:30 PM)

The Traffic Management Consultant
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Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: Hihimanu St Ahiki St
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Ahiki St Northbound					Park Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:15 AM	0	28	1	0	29	3	48	0	0	51	0	1	0	0	1	1	0	3	0	4	85
7:30 AM	3	28	2	0	33	6	60	2	0	68	1	0	3	0	4	0	0	0	0	0	105
7:45 AM	2	25	1	0	28	4	37	0	0	41	1	0	3	0	4	3	0	1	0	4	77
8:00 AM	2	17	2	0	21	1	23	1	0	25	0	0	4	0	4	0	0	1	0	1	51
Total	7	98	6	0	111	14	168	3	0	185	2	1	10	0	13	4	0	5	0	9	318
Approach %	6.3	88.3	5.4	-	-	7.6	90.8	1.6	-	-	15.4	7.7	76.9	-	-	44.4	0.0	55.6	-	-	-
Total %	2.2	30.8	1.9	-	34.9	4.4	52.8	0.9	-	58.2	0.6	0.3	3.1	-	4.1	1.3	0.0	1.6	-	2.8	-
PHF	0.583	0.875	0.750	-	0.841	0.583	0.700	0.375	-	0.680	0.500	0.250	0.625	-	0.813	0.333	0.000	0.417	-	0.563	0.757
Motorcycles	0	1	0	-	1	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	2
% Motorcycles	0.0	1.0	0.0	-	0.9	0.0	0.6	0.0	-	0.5	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.6
Cars	6	52	5	-	63	8	150	3	-	161	1	1	7	-	9	3	0	3	-	6	239
% Cars	85.7	53.1	83.3	-	56.8	57.1	89.3	100.0	-	87.0	50.0	100.0	70.0	-	69.2	75.0	-	60.0	-	66.7	75.2
Light Goods Vehicles	1	42	1	-	44	6	15	0	-	21	0	0	3	-	3	1	0	2	-	3	71
% Light Goods Vehicles	14.3	42.9	16.7	-	39.6	42.9	8.9	0.0	-	11.4	0.0	0.0	30.0	-	23.1	25.0	-	40.0	-	33.3	22.3
Buses	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Buses	0.0	1.0	0.0	-	0.9	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.3
Single-Unit Trucks	0	2	0	-	2	0	2	0	-	2	1	0	0	-	1	0	0	0	-	0	5
% Single-Unit Trucks	0.0	2.0	0.0	-	1.8	0.0	1.2	0.0	-	1.1	50.0	0.0	0.0	-	7.7	0.0	-	0.0	-	0.0	1.6
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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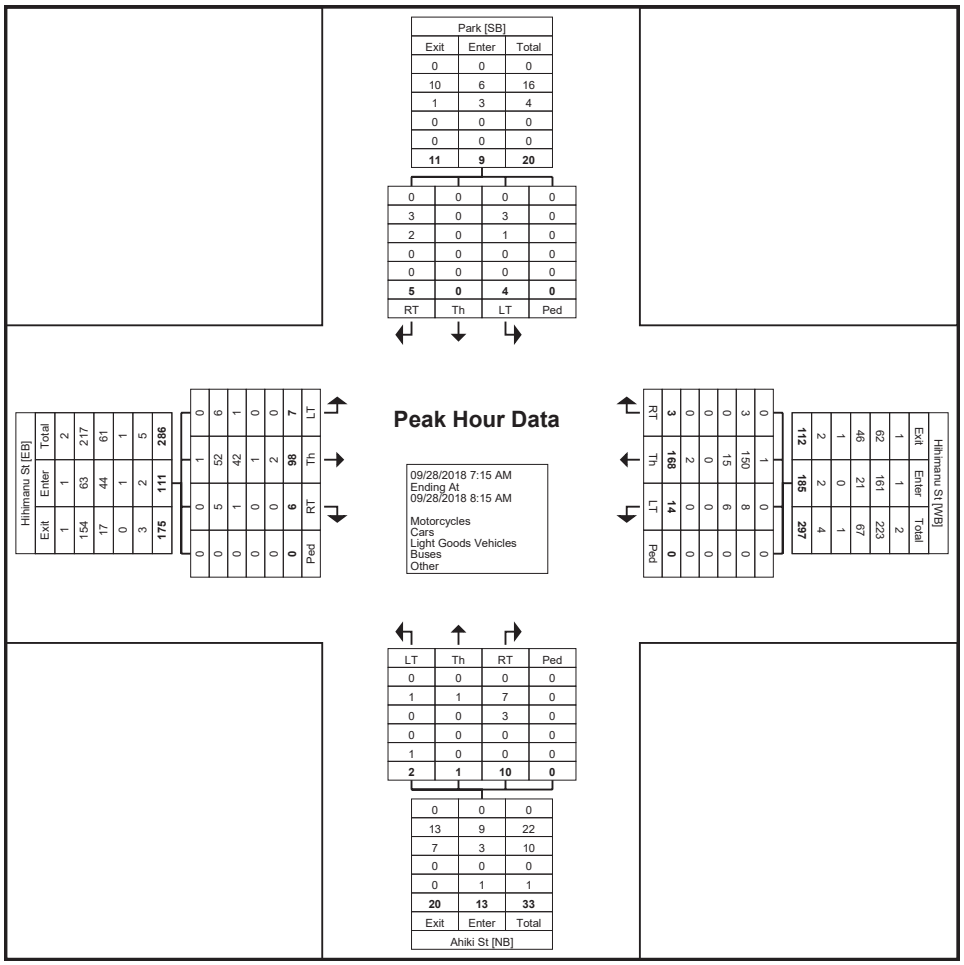

Turning Movement Peak Hour Data Plot (7:15 AM)

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808-536-0223 tmchawaii@aol.com

Count Name: Hihimanu St Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Data

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
2:00 PM	2	1	9	0	12	1	1	4	0	6	9	130	0	0	139	1	123	0	0	124	281
2:15 PM	5	0	14	0	19	0	0	4	0	4	11	137	1	0	149	2	149	6	0	157	329
2:30 PM	5	0	13	0	18	0	1	9	0	10	17	151	3	0	171	4	132	2	0	138	337
2:45 PM	5	1	5	1	11	0	0	9	6	9	12	123	1	5	136	5	129	3	1	137	293
Hourly Total	17	2	41	1	60	1	2	26	6	29	49	541	5	5	595	12	533	11	1	556	1240
3:00 PM	3	3	4	2	10	0	0	2	3	2	13	107	0	3	120	3	150	3	0	156	288
3:15 PM	1	1	14	1	16	2	0	3	0	5	5	129	1	0	135	0	146	2	0	148	304
3:30 PM	2	2	8	0	12	0	1	2	0	3	12	146	1	0	159	1	141	0	0	142	316
3:45 PM	1	1	16	0	18	0	0	3	1	3	16	112	4	0	132	2	153	3	0	158	311
Hourly Total	7	7	42	3	56	2	1	10	4	13	46	494	6	3	546	6	590	8	0	604	1219
4:00 PM	0	1	22	0	23	1	2	2	0	5	12	135	0	0	147	6	155	2	0	163	338
4:15 PM	1	0	18	5	19	0	0	0	1	0	10	126	0	1	136	5	132	1	0	138	293
4:30 PM	4	1	14	1	19	1	0	2	0	3	10	117	0	1	127	4	169	2	0	175	324
4:45 PM	4	1	18	2	23	2	0	3	4	5	8	129	1	0	138	2	159	2	0	163	329
Hourly Total	9	3	72	8	84	4	2	7	5	13	40	507	1	2	548	17	615	7	0	639	1284
5:00 PM	2	2	15	2	19	1	0	0	0	1	6	111	2	0	119	3	161	1	0	165	304
5:15 PM	0	1	11	1	12	0	0	0	1	0	13	114	1	0	128	2	170	0	0	172	312
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	2	3	26	3	31	1	0	0	1	1	19	225	3	0	247	5	331	1	0	337	616
6:30 AM	0	1	4	1	5	0	1	0	0	1	6	122	1	0	129	1	68	2	0	71	206
6:45 AM	0	1	6	1	7	0	0	0	1	0	8	129	1	0	138	1	80	1	0	82	227
Hourly Total	0	2	10	2	12	0	1	0	1	1	14	251	2	0	267	2	148	3	0	153	433
7:00 AM	1	0	8	6	9	0	3	0	4	3	13	168	0	4	181	1	80	3	0	84	277
7:15 AM	3	1	13	0	17	2	1	4	0	7	15	139	0	0	154	3	120	3	0	126	304
7:30 AM	6	1	23	1	30	1	1	8	4	10	15	155	3	2	173	1	136	0	0	137	350
7:45 AM	4	1	15	0	20	2	0	0	1	2	14	135	1	1	150	3	136	6	0	145	317
Hourly Total	14	3	59	7	76	5	5	12	9	22	57	597	4	7	658	8	472	12	0	492	1248
8:00 AM	4	0	15	1	19	1	1	4	1	6	9	129	1	1	139	1	142	2	0	145	309
8:15 AM	0	0	11	2	11	3	1	2	0	6	6	142	3	0	151	1	100	2	0	103	271
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	4	0	26	3	30	4	2	6	1	12	15	271	4	1	290	2	242	4	0	248	580
2:00 PM	2	1	6	0	9	2	0	2	0	4	7	138	0	0	145	2	121	1	0	124	282
2:15 PM	3	4	12	1	19	0	1	1	1	2	9	140	1	0	150	6	145	3	0	154	325
2:30 PM	4	3	8	2	15	3	1	7	4	11	9	149	1	4	159	2	131	1	0	134	319
2:45 PM	6	0	9	0	15	0	0	7	0	7	13	139	1	0	153	1	139	2	1	142	317
Hourly Total	15	8	35	3	58	5	2	17	5	24	38	566	3	4	607	11	536	7	1	554	1243
3:00 PM	3	1	17	0	21	1	0	3	0	4	9	131	1	0	141	3	134	5	1	142	308
3:15 PM	2	0	15	0	17	0	1	1	0	2	10	126	3	0	139	2	144	2	0	148	306
3:30 PM	4	2	13	1	19	1	1	2	1	4	14	127	3	1	144	0	147	2	0	149	316
3:45 PM	1	0	9	1	10	0	2	3	0	5	11	124	3	0	138	4	157	1	0	162	315
Hourly Total	10	3	54	2	67	2	4	9	1	15	44	508	10	1	562	9	582	10	1	601	1245

4:00 PM	1	1	14	3	16	2	0	3	0	5	8	122	1	0	131	2	142	5	0	149	301
4:15 PM	3	0	8	1	11	3	2	2	9	7	16	128	1	1	145	7	159	3	0	169	332
4:30 PM	1	2	18	2	21	1	0	1	0	2	10	147	1	0	158	5	159	3	0	167	348
4:45 PM	3	2	14	0	19	2	0	1	0	3	11	132	4	0	147	1	172	0	0	173	342
Hourly Total	8	5	54	6	67	8	2	7	9	17	45	529	7	1	581	15	632	11	0	658	1323
5:00 PM	0	0	12	0	12	2	1	1	0	4	12	126	2	0	140	0	172	0	0	172	328
5:15 PM	5	1	7	0	13	1	2	0	1	3	6	102	3	1	111	3	151	1	0	155	282
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	5	1	19	0	25	3	3	1	1	7	18	228	5	1	251	3	323	1	0	327	610
6:30 AM	0	2	5	1	7	0	0	4	1	4	6	97	0	0	103	2	58	1	0	61	175
6:45 AM	1	0	5	0	6	1	2	0	1	3	8	110	1	1	119	2	70	0	0	72	200
Hourly Total	1	2	10	1	13	1	2	4	2	7	14	207	1	1	222	4	128	1	0	133	375
7:00 AM	4	0	8	5	12	0	0	4	4	4	8	161	1	4	170	3	73	1	1	77	263
7:15 AM	8	1	10	0	19	3	1	7	5	11	16	151	0	2	167	0	115	2	0	117	314
7:30 AM	9	0	23	2	32	1	2	8	2	11	16	120	0	0	136	1	149	5	0	155	334
7:45 AM	3	0	25	0	28	0	0	0	0	0	11	130	0	0	141	1	128	3	0	132	301
Hourly Total	24	1	66	7	91	4	3	19	11	26	51	562	1	6	614	5	465	11	1	481	1212
8:00 AM	1	1	9	2	11	0	1	1	0	2	11	125	0	1	136	1	135	2	0	138	287
8:15 AM	1	0	14	1	15	3	0	1	0	4	9	137	1	0	147	2	129	1	0	132	298
Grand Total	118	41	537	49	696	43	30	120	56	193	470	5748	53	33	6271	102	5861	90	4	6053	13213
Approach %	17.0	5.9	77.2	-	-	22.3	15.5	62.2	-	-	7.5	91.7	0.8	-	-	1.7	96.8	1.5	-	-	-
Total %	0.9	0.3	4.1	-	5.3	0.3	0.2	0.9	-	1.5	3.6	43.5	0.4	-	47.5	0.8	44.4	0.7	-	45.8	-
Motorcycles	0	0	5	-	5	0	0	0	-	0	2	33	0	-	35	1	36	0	-	37	77
% Motorcycles	0.0	0.0	0.9	-	0.7	0.0	0.0	0.0	-	0.0	0.4	0.6	0.0	-	0.6	1.0	0.6	0.0	-	0.6	0.6
Cars	81	21	274	-	376	31	14	97	-	142	272	4252	35	-	4559	80	4303	55	-	4438	9515
% Cars	68.6	51.2	51.0	-	54.0	72.1	46.7	80.8	-	73.6	57.9	74.0	66.0	-	72.7	78.4	73.4	61.1	-	73.3	72.0
Light Goods Vehicles	34	19	239	-	292	12	14	20	-	46	183	1300	16	-	1499	20	1375	34	-	1429	3266
% Light Goods Vehicles	28.8	46.3	44.5	-	42.0	27.9	46.7	16.7	-	23.8	38.9	22.6	30.2	-	23.9	19.6	23.5	37.8	-	23.6	24.7
Buses	1	0	3	-	4	0	0	0	-	0	1	92	0	-	93	0	84	1	-	85	182
% Buses	0.8	0.0	0.6	-	0.6	0.0	0.0	0.0	-	0.0	0.2	1.6	0.0	-	1.5	0.0	1.4	1.1	-	1.4	1.4
Single-Unit Trucks	0	1	15	-	16	0	1	3	-	4	10	51	2	-	63	1	56	0	-	57	140
% Single-Unit Trucks	0.0	2.4	2.8	-	2.3	0.0	3.3	2.5	-	2.1	2.1	0.9	3.8	-	1.0	1.0	1.0	0.0	-	0.9	1.1
Articulated Trucks	0	0	1	-	1	0	0	0	-	0	1	13	0	-	14	0	4	0	-	4	19
% Articulated Trucks	0.0	0.0	0.2	-	0.1	0.0	0.0	0.0	-	0.0	0.2	0.2	0.0	-	0.2	0.0	0.1	0.0	-	0.1	0.1
Bicycles on Road	2	0	0	-	2	0	1	0	-	1	1	7	0	-	8	0	3	0	-	3	14
% Bicycles on Road	1.7	0.0	0.0	-	0.3	0.0	3.3	0.0	-	0.5	0.2	0.1	0.0	-	0.1	0.0	0.1	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	8	-	-	-	-	2	-	-	-	-	1	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	16.3	-	-	-	-	3.6	-	-	-	-	3.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	41	-	-	-	-	54	-	-	-	-	32	-	-	-	-	4	-	-
% Pedestrians	-	-	-	83.7	-	-	-	-	96.4	-	-	-	-	97.0	-	-	-	-	100.0	-	-

The Traffic Management Consultant
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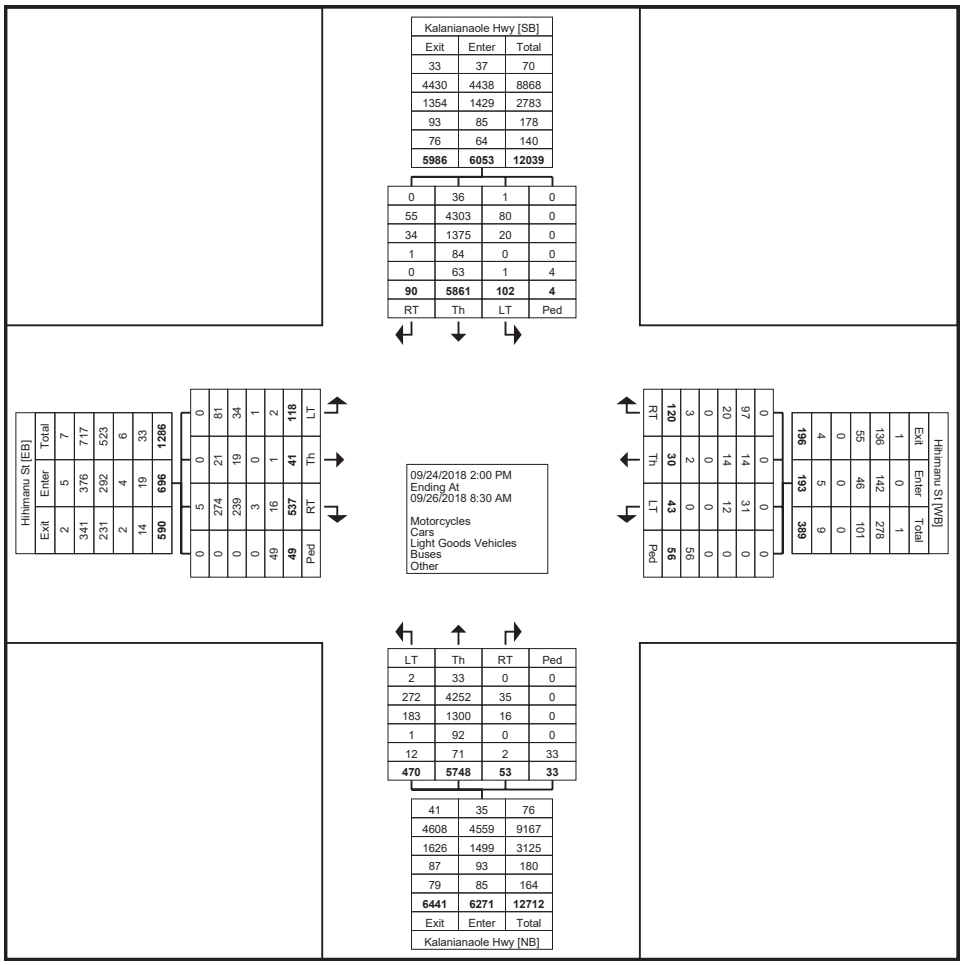
Count Name: Hihimanu St Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Data Plot

The Traffic Management Consultant
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Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: Hihimanu St Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
4:00 PM	0	1	22	0	23	1	2	2	0	5	12	135	0	0	147	6	155	2	0	163	338
4:15 PM	1	0	18	5	19	0	0	0	1	0	10	126	0	1	136	5	132	1	0	138	293
4:30 PM	4	1	14	1	19	1	0	2	0	3	10	117	0	1	127	4	169	2	0	175	324
4:45 PM	4	1	18	2	23	2	0	3	4	5	8	129	1	0	138	2	159	2	0	163	329
Total	9	3	72	8	84	4	2	7	5	13	40	507	1	2	548	17	615	7	0	639	1284
Approach %	10.7	3.6	85.7	-	-	30.8	15.4	53.8	-	-	7.3	92.5	0.2	-	-	2.7	96.2	1.1	-	-	-
Total %	0.7	0.2	5.6	-	6.5	0.3	0.2	0.5	-	1.0	3.1	39.5	0.1	-	42.7	1.3	47.9	0.5	-	49.8	-
PHF	0.563	0.750	0.818	-	0.913	0.500	0.250	0.583	-	0.650	0.833	0.939	0.250	-	0.932	0.708	0.910	0.875	-	0.913	0.950
Motorcycles	0	0	1	-	1	0	0	0	-	0	1	7	0	-	8	0	9	0	-	9	18
% Motorcycles	0.0	0.0	1.4	-	1.2	0.0	0.0	0.0	-	0.0	2.5	1.4	0.0	-	1.5	0.0	1.5	0.0	-	1.4	1.4
Cars	5	2	43	-	50	3	2	4	-	9	29	369	1	-	399	11	463	5	-	479	937
% Cars	55.6	66.7	59.7	-	59.5	75.0	100.0	57.1	-	69.2	72.5	72.8	100.0	-	72.8	64.7	75.3	71.4	-	75.0	73.0
Light Goods Vehicles	3	1	28	-	32	1	0	3	-	4	10	121	0	-	131	6	135	2	-	143	310
% Light Goods Vehicles	33.3	33.3	38.9	-	38.1	25.0	0.0	42.9	-	30.8	25.0	23.9	0.0	-	23.9	35.3	22.0	28.6	-	22.4	24.1
Buses	0	0	0	-	0	0	0	0	-	0	0	6	0	-	6	0	7	0	-	7	13
% Buses	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	1.2	0.0	-	1.1	0.0	1.1	0.0	-	1.1	1.0
Single-Unit Trucks	0	0	0	-	0	0	0	0	-	0	0	2	0	-	2	0	1	0	-	1	3
% Single-Unit Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.4	0.0	-	0.4	0.0	0.2	0.0	-	0.2	0.2
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.4	0.0	-	0.4	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	11.1	0.0	0.0	-	1.2	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	20.0	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	8	-	-	-	-	4	-	-	-	-	2	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	80.0	-	-	-	-	100.0	-	-	-	-	-	-	-

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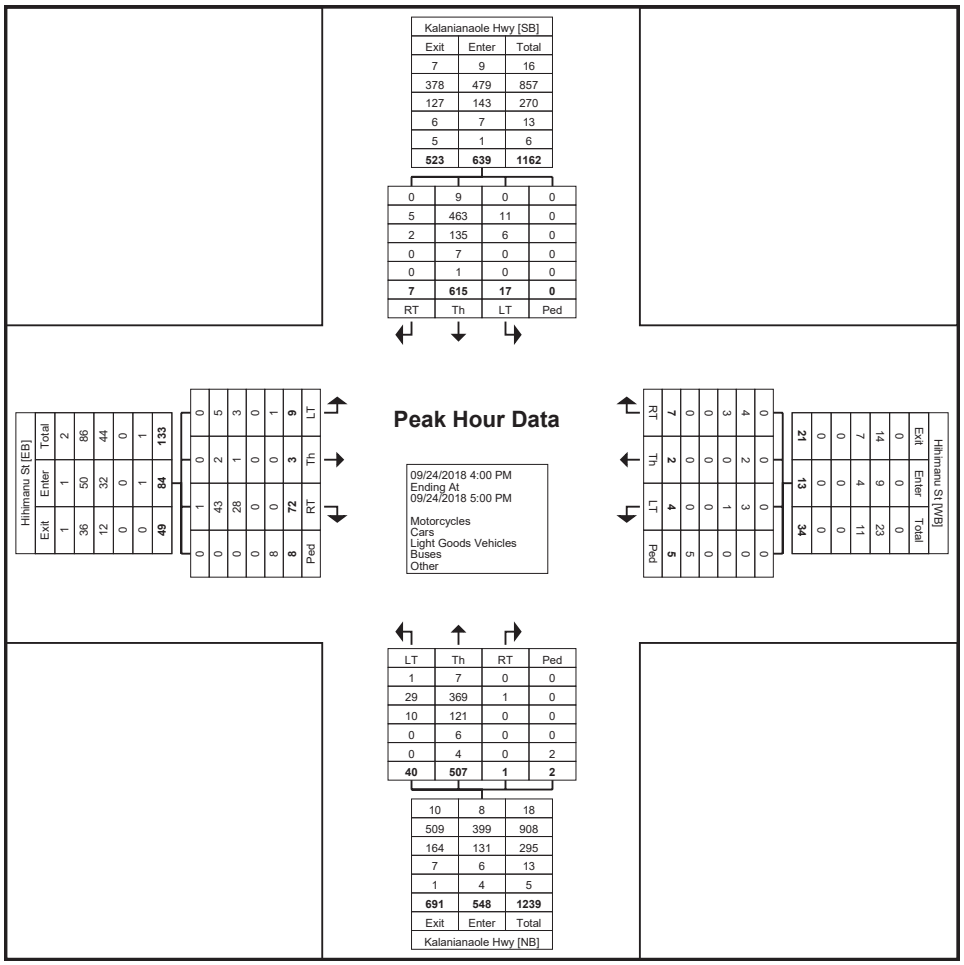
Count Name: Hihimanu St Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (4:00 PM)

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Count Name: Hihimanu St Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (2:15 PM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
2:15 PM	5	0	14	0	19	0	0	4	0	4	11	137	1	0	149	2	149	6	0	157	329
2:30 PM	5	0	13	0	18	0	1	9	0	10	17	151	3	0	171	4	132	2	0	138	337
2:45 PM	5	1	5	1	11	0	0	9	6	9	12	123	1	5	136	5	129	3	1	137	293
3:00 PM	3	3	4	2	10	0	0	2	3	2	13	107	0	3	120	3	150	3	0	156	288
Total	18	4	36	3	58	0	1	24	9	25	53	518	5	8	576	14	560	14	1	588	1247
Approach %	31.0	6.9	62.1	-	-	0.0	4.0	96.0	-	-	9.2	89.9	0.9	-	-	2.4	95.2	2.4	-	-	-
Total %	1.4	0.3	2.9	-	4.7	0.0	0.1	1.9	-	2.0	4.3	41.5	0.4	-	46.2	1.1	44.9	1.1	-	47.2	-
PHF	0.900	0.333	0.643	-	0.763	0.000	0.250	0.667	-	0.625	0.779	0.858	0.417	-	0.842	0.700	0.933	0.583	-	0.936	0.925
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	4	0	-	4	1	7	0	-	8	12
% Motorcycles	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0	0.8	0.0	-	0.7	7.1	1.3	0.0	-	1.4	1.0
Cars	11	4	18	-	33	0	0	22	-	22	24	405	5	-	434	9	408	11	-	428	917
% Cars	61.1	100.0	50.0	-	56.9	-	0.0	91.7	-	88.0	45.3	78.2	100.0	-	75.3	64.3	72.9	78.6	-	72.8	73.5
Light Goods Vehicles	6	0	17	-	23	0	1	2	-	3	27	102	0	-	129	4	127	3	-	134	289
% Light Goods Vehicles	33.3	0.0	47.2	-	39.7	-	100.0	8.3	-	12.0	50.9	19.7	0.0	-	22.4	28.6	22.7	21.4	-	22.8	23.2
Buses	1	0	0	-	1	0	0	0	-	0	0	7	0	-	7	0	13	0	-	13	21
% Buses	5.6	0.0	0.0	-	1.7	-	0.0	0.0	-	0.0	0.0	1.4	0.0	-	1.2	0.0	2.3	0.0	-	2.2	1.7
Single-Unit Trucks	0	0	1	-	1	0	0	0	-	0	2	0	0	-	2	0	5	0	-	5	8
% Single-Unit Trucks	0.0	0.0	2.8	-	1.7	-	0.0	0.0	-	0.0	3.8	0.0	0.0	-	0.3	0.0	0.9	0.0	-	0.9	0.6
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	3	-	-	-	-	9	-	-	-	-	8	-	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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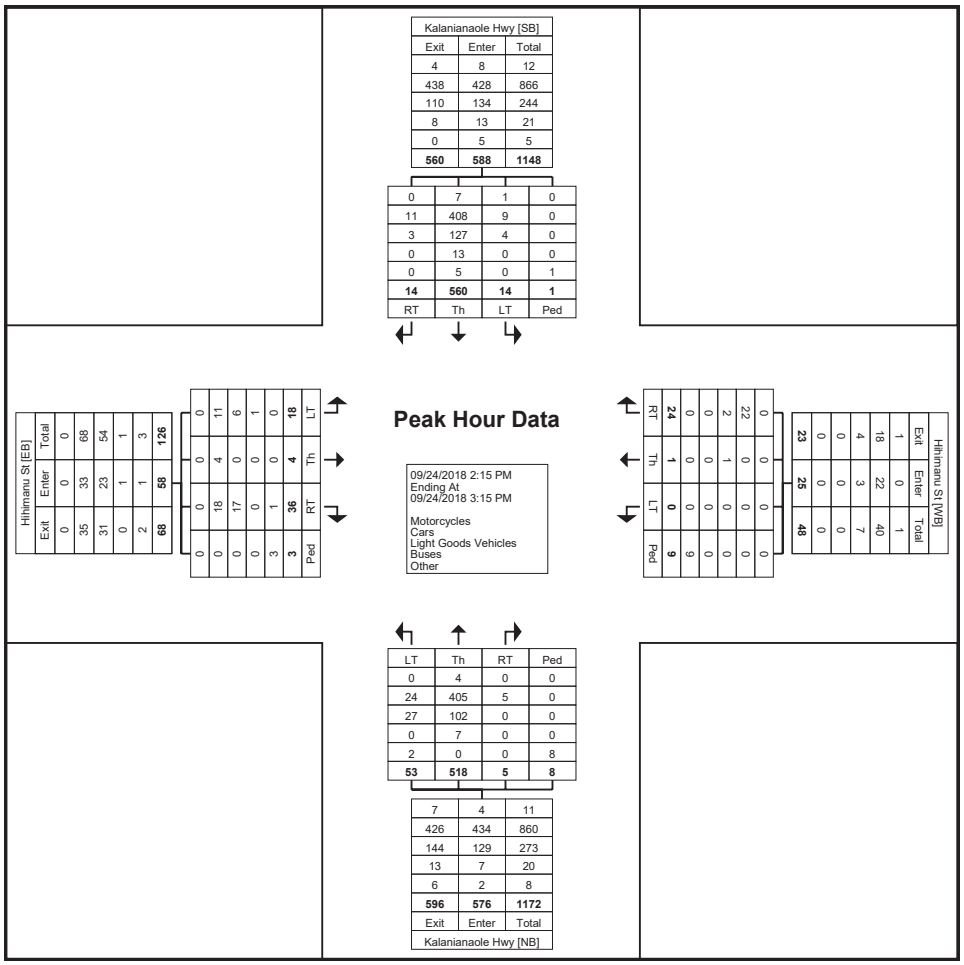
Count Name: Hihimanu St Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (2:15 PM)

The Traffic Management Consultant
1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: Hihimanu St Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:15 AM	3	1	13	0	17	2	1	4	0	7	15	139	0	0	154	3	120	3	0	126	304
7:30 AM	6	1	23	1	30	1	1	8	4	10	15	155	3	2	173	1	136	0	0	137	350
7:45 AM	4	1	15	0	20	2	0	0	1	2	14	135	1	1	150	3	136	6	0	145	317
8:00 AM	4	0	15	1	19	1	1	4	1	6	9	129	1	1	139	1	142	2	0	145	309
Total	17	3	66	2	86	6	3	16	6	25	53	558	5	4	616	8	534	11	0	553	1280
Approach %	19.8	3.5	76.7	-	-	24.0	12.0	64.0	-	-	8.6	90.6	0.8	-	-	1.4	96.6	2.0	-	-	-
Total %	1.3	0.2	5.2	-	6.7	0.5	0.2	1.3	-	2.0	4.1	43.6	0.4	-	48.1	0.6	41.7	0.9	-	43.2	-
PHF	0.708	0.750	0.717	-	0.717	0.750	0.750	0.500	-	0.625	0.883	0.900	0.417	-	0.890	0.667	0.940	0.458	-	0.953	0.914
Motorcycles	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	0	1	0	-	1	2
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	1.9	0.0	0.0	-	0.2	0.0	0.2	0.0	-	0.2	0.2
Cars	12	0	29	-	41	4	0	13	-	17	37	423	2	-	462	4	389	7	-	400	920
% Cars	70.6	0.0	43.9	-	47.7	66.7	0.0	81.3	-	68.0	69.8	75.8	40.0	-	75.0	50.0	72.8	63.6	-	72.3	71.9
Light Goods Vehicles	5	3	32	-	40	2	3	3	-	8	14	119	3	-	136	4	130	4	-	138	322
% Light Goods Vehicles	29.4	100.0	48.5	-	46.5	33.3	100.0	18.8	-	32.0	26.4	21.3	60.0	-	22.1	50.0	24.3	36.4	-	25.0	25.2
Buses	0	0	1	-	1	0	0	0	-	0	0	6	0	-	6	0	5	0	-	5	12
% Buses	0.0	0.0	1.5	-	1.2	0.0	0.0	0.0	-	0.0	0.0	1.1	0.0	-	1.0	0.0	0.9	0.0	-	0.9	0.9
Single-Unit Trucks	0	0	4	-	4	0	0	0	-	0	1	6	0	-	7	0	9	0	-	9	20
% Single-Unit Trucks	0.0	0.0	6.1	-	4.7	0.0	0.0	0.0	-	0.0	1.9	1.1	0.0	-	1.1	0.0	1.7	0.0	-	1.6	1.6
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	3	0	-	3	0	0	0	-	0	3
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.5	0.0	-	0.5	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.2	0.0	-	0.2	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	50.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	1	-	-	-	-	6	-	-	-	-	4	-	-	-	-	0	-	-
% Pedestrians	-	-	-	50.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-

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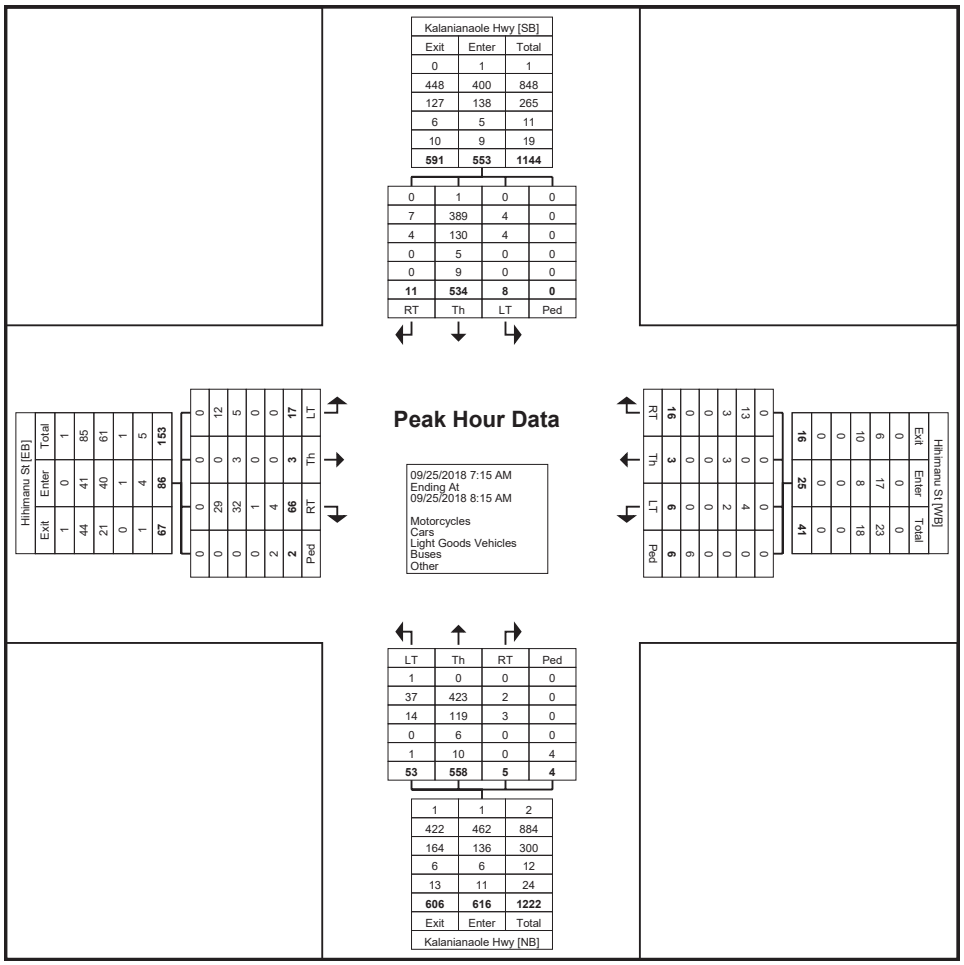
Count Name: Hihimanu St Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018



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Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
4:15 PM	3	0	8	1	11	3	2	2	9	7	16	128	1	1	145	7	159	3	0	169	332
4:30 PM	1	2	18	2	21	1	0	1	0	2	10	147	1	0	158	5	159	3	0	167	348
4:45 PM	3	2	14	0	19	2	0	1	0	3	11	132	4	0	147	1	172	0	0	173	342
5:00 PM	0	0	12	0	12	2	1	1	0	4	12	126	2	0	140	0	172	0	0	172	328
Total	7	4	52	3	63	8	3	5	9	16	49	533	8	1	590	13	662	6	0	681	1350
Approach %	11.1	6.3	82.5	-	-	50.0	18.8	31.3	-	-	8.3	90.3	1.4	-	-	1.9	97.2	0.9	-	-	-
Total %	0.5	0.3	3.9	-	4.7	0.6	0.2	0.4	-	1.2	3.6	39.5	0.6	-	43.7	1.0	49.0	0.4	-	50.4	-
PHF	0.583	0.500	0.722	-	0.750	0.667	0.375	0.625	-	0.571	0.766	0.906	0.500	-	0.934	0.464	0.962	0.500	-	0.984	0.970
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	4	0	-	4	0	2	0	-	2	6
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.8	0.0	-	0.7	0.0	0.3	0.0	-	0.3	0.4
Cars	4	3	26	-	33	8	2	2	-	12	26	395	5	-	426	11	489	2	-	502	973
% Cars	57.1	75.0	50.0	-	52.4	100.0	66.7	40.0	-	75.0	53.1	74.1	62.5	-	72.2	84.6	73.9	33.3	-	73.7	72.1
Light Goods Vehicles	2	1	26	-	29	0	1	1	-	2	23	124	3	-	150	1	161	4	-	166	347
% Light Goods Vehicles	28.6	25.0	50.0	-	46.0	0.0	33.3	20.0	-	12.5	46.9	23.3	37.5	-	25.4	7.7	24.3	66.7	-	24.4	25.7
Buses	0	0	0	-	0	0	0	0	-	0	0	7	0	-	7	0	8	0	-	8	15
% Buses	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	1.3	0.0	-	1.2	0.0	1.2	0.0	-	1.2	1.1
Single-Unit Trucks	0	0	0	-	0	0	0	2	-	2	0	2	0	-	2	1	2	0	-	3	7
% Single-Unit Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	40.0	-	12.5	0.0	0.4	0.0	-	0.3	7.7	0.3	0.0	-	0.4	0.5
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	2
% Bicycles on Road	14.3	0.0	0.0	-	1.6	0.0	0.0	0.0	-	0.0	0.0	0.2	0.0	-	0.2	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	2	-	-	-	-	1	-	-	-	-	1	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	66.7	-	-	-	-	11.1	-	-	-	-	100.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	1	-	-	-	-	8	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	33.3	-	-	-	-	88.9	-	-	-	-	0.0	-	-	-	-	-	-	-

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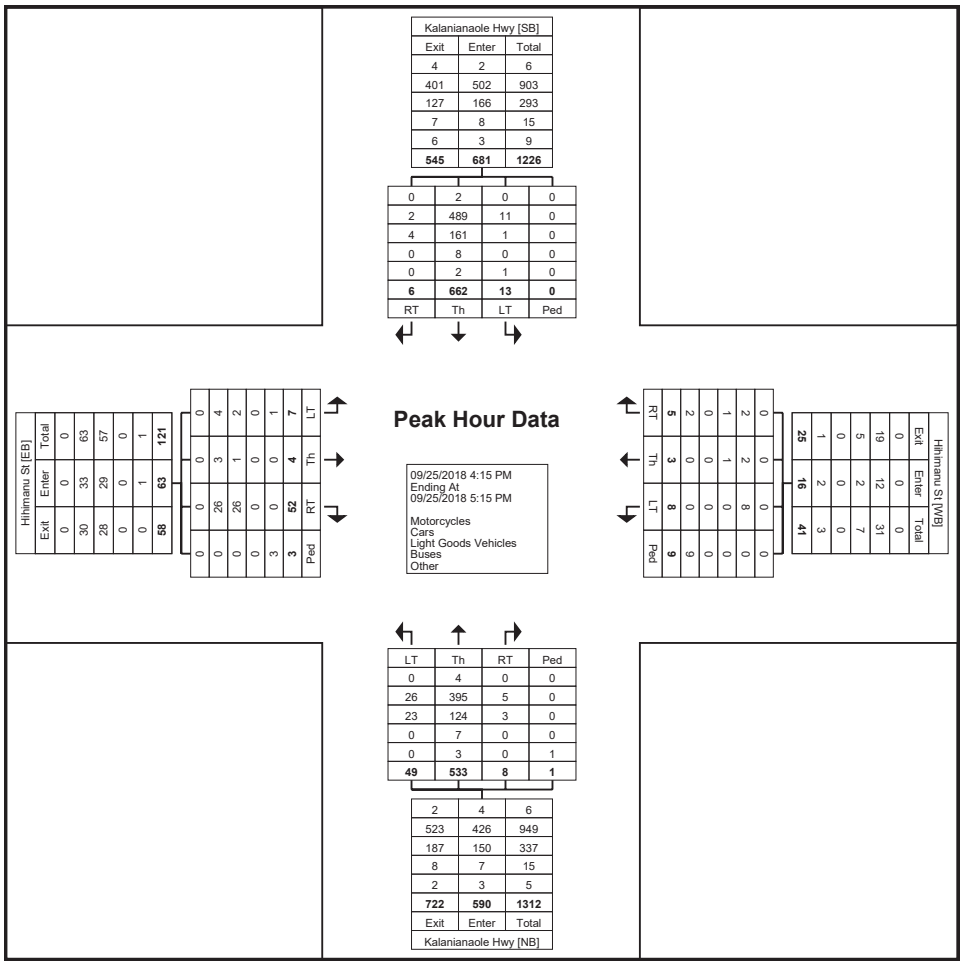

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Start Date: 09/24/2018

Turning Movement Peak Hour Data (2:15 PM)

Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
2:15 PM	3	4	12	1	19	0	1	1	1	2	9	140	1	0	150	6	145	3	0	154	325
2:30 PM	4	3	8	2	15	3	1	7	4	11	9	149	1	4	159	2	131	1	0	134	319
2:45 PM	6	0	9	0	15	0	0	7	0	7	13	139	1	0	153	1	139	2	1	142	317
3:00 PM	3	1	17	0	21	1	0	3	0	4	9	131	1	0	141	3	134	5	1	142	308
Total	16	8	46	3	70	4	2	18	5	24	40	559	4	4	603	12	549	11	2	572	1269
Approach %	22.9	11.4	65.7	-	-	16.7	8.3	75.0	-	-	6.6	92.7	0.7	-	-	2.1	96.0	1.9	-	-	-
Total %	1.3	0.6	3.6	-	5.5	0.3	0.2	1.4	-	1.9	3.2	44.1	0.3	-	47.5	0.9	43.3	0.9	-	45.1	-
PHF	0.667	0.500	0.676	-	0.833	0.333	0.500	0.643	-	0.545	0.769	0.938	1.000	-	0.948	0.500	0.947	0.550	-	0.929	0.976
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	6	0	-	6	0	3	0	-	3	9
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	1.1	0.0	-	1.0	0.0	0.5	0.0	-	0.5	0.7
Cars	14	3	21	-	38	2	1	15	-	18	20	419	3	-	442	11	402	7	-	420	918
% Cars	87.5	37.5	45.7	-	54.3	50.0	50.0	83.3	-	75.0	50.0	75.0	75.0	-	73.3	91.7	73.2	63.6	-	73.4	72.3
Light Goods Vehicles	2	5	23	-	30	2	1	3	-	6	19	113	1	-	133	1	125	4	-	130	299
% Light Goods Vehicles	12.5	62.5	50.0	-	42.9	50.0	50.0	16.7	-	25.0	47.5	20.2	25.0	-	22.1	8.3	22.8	36.4	-	22.7	23.6
Buses	0	0	0	-	0	0	0	0	-	0	0	12	0	-	12	0	13	0	-	13	25
% Buses	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	2.1	0.0	-	2.0	0.0	2.4	0.0	-	2.3	2.0
Single-Unit Trucks	0	0	2	-	2	0	0	0	-	0	0	6	0	-	6	0	5	0	-	5	13
% Single-Unit Trucks	0.0	0.0	4.3	-	2.9	0.0	0.0	0.0	-	0.0	0.0	1.1	0.0	-	1.0	0.0	0.9	0.0	-	0.9	1.0
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	1	2	0	-	3	0	1	0	-	1	4
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	2.5	0.4	0.0	-	0.5	0.0	0.2	0.0	-	0.2	0.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.2	0.0	-	0.2	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	3	-	-	-	-	5	-	-	-	-	4	-	-	-	-	2	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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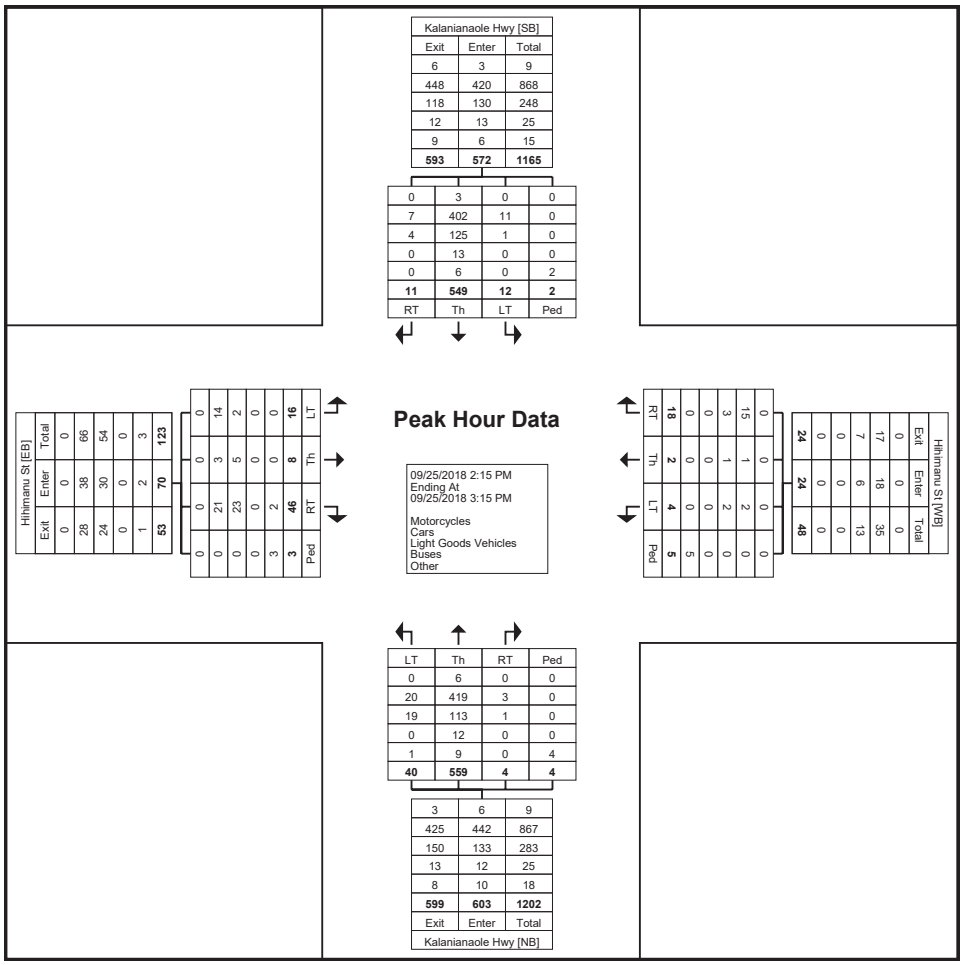

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Start Time	Hihimanu St Eastbound					Hihimanu St Westbound					Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound					
	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Int. Total
7:15 AM	8	1	10	0	19	3	1	7	5	11	16	151	0	2	167	0	115	2	0	117	314
7:30 AM	9	0	23	2	32	1	2	8	2	11	16	120	0	0	136	1	149	5	0	155	334
7:45 AM	3	0	25	0	28	0	0	0	0	0	11	130	0	0	141	1	128	3	0	132	301
8:00 AM	1	1	9	2	11	0	1	1	0	2	11	125	0	1	136	1	135	2	0	138	287
Total	21	2	67	4	90	4	4	16	7	24	54	526	0	3	580	3	527	12	0	542	1236
Approach %	23.3	2.2	74.4	-	-	16.7	16.7	66.7	-	-	9.3	90.7	0.0	-	-	0.6	97.2	2.2	-	-	-
Total %	1.7	0.2	5.4	-	7.3	0.3	0.3	1.3	-	1.9	4.4	42.6	0.0	-	46.9	0.2	42.6	1.0	-	43.9	-
PHF	0.583	0.500	0.670	-	0.703	0.333	0.500	0.500	-	0.545	0.844	0.871	0.000	-	0.868	0.750	0.884	0.600	-	0.874	0.925
Motorcycles	0	0	1	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Motorcycles	0.0	0.0	1.5	-	1.1	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.1
Cars	14	0	26	-	40	4	0	14	-	18	38	389	0	-	427	3	383	10	-	396	881
% Cars	66.7	0.0	38.8	-	44.4	100.0	0.0	87.5	-	75.0	70.4	74.0	-	-	73.6	100.0	72.7	83.3	-	73.1	71.3
Light Goods Vehicles	7	2	35	-	44	0	4	2	-	6	16	123	0	-	139	0	133	2	-	135	324
% Light Goods Vehicles	33.3	100.0	52.2	-	48.9	0.0	100.0	12.5	-	25.0	29.6	23.4	-	-	24.0	0.0	25.2	16.7	-	24.9	26.2
Buses	0	0	1	-	1	0	0	0	-	0	0	7	0	-	7	0	5	0	-	5	13
% Buses	0.0	0.0	1.5	-	1.1	0.0	0.0	0.0	-	0.0	0.0	1.3	-	-	1.2	0.0	0.9	0.0	-	0.9	1.1
Single-Unit Trucks	0	0	3	-	3	0	0	0	-	0	0	7	0	-	7	0	6	0	-	6	16
% Single-Unit Trucks	0.0	0.0	4.5	-	3.3	0.0	0.0	0.0	-	0.0	0.0	1.3	-	-	1.2	0.0	1.1	0.0	-	1.1	1.3
Articulated Trucks	0	0	1	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	1.5	-	1.1	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	25.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	3	-	-	-	-	7	-	-	-	-	3	-	-	-	-	0	-	-
% Pedestrians	-	-	-	75.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-

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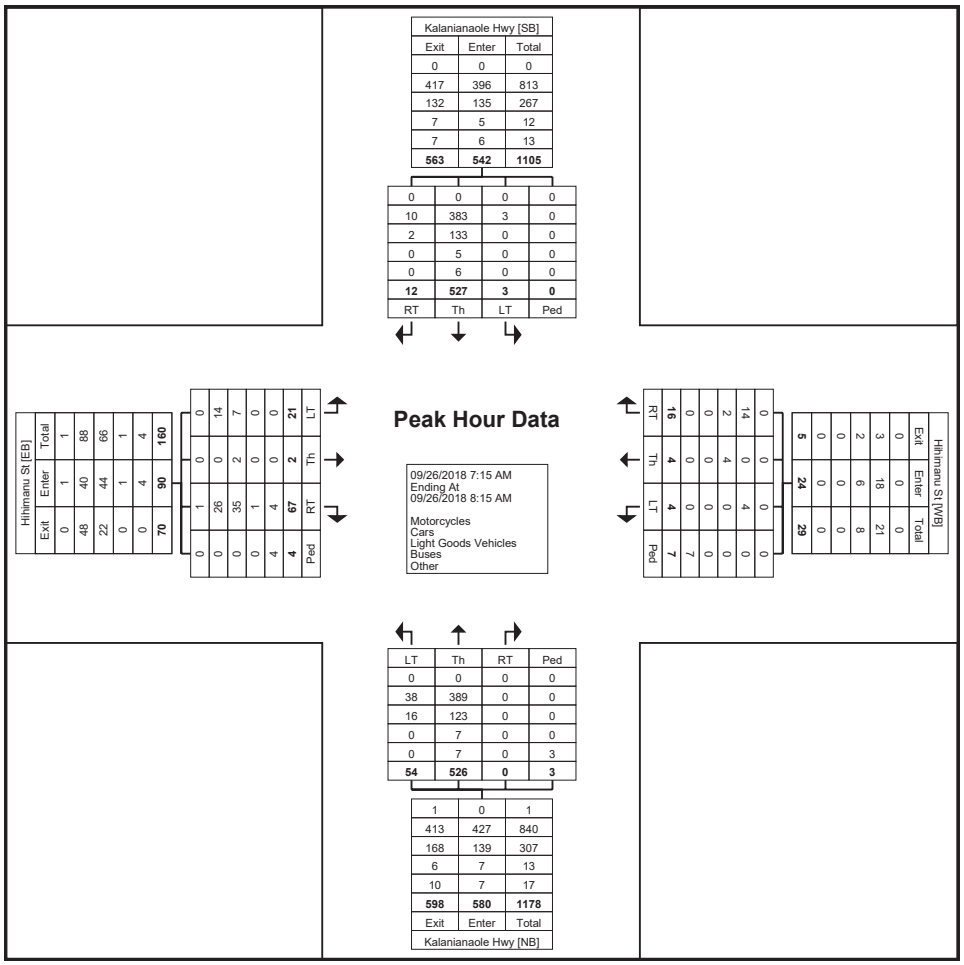
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (7:15 AM)

The Traffic Management Consultant
1188 Bishop Street, Suite 1907

Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: St Matthews Dwy Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Data

Start Time	St Matthews Westbound				Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound				
	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Int. Total
1:30 PM	1	0	1	1	0	131	0	0	131	0	112	0	112	244
1:45 PM	0	0	0	0	0	134	0	0	134	0	102	0	102	236
Hourly Total	1	0	1	1	0	265	0	0	265	0	214	0	214	480
2:00 PM	1	0	0	1	0	135	1	0	136	1	121	0	122	259
2:15 PM	2	0	0	2	0	139	4	0	143	0	155	0	155	300
2:30 PM	1	10	0	11	0	154	15	0	169	1	135	0	136	316
2:45 PM	13	12	0	25	0	121	17	0	138	7	125	0	132	295
Hourly Total	17	22	0	39	0	549	37	0	586	9	536	0	545	1170
3:00 PM	4	5	2	9	0	108	5	0	113	4	151	0	155	277
3:15 PM	1	1	0	2	0	136	0	0	136	0	150	0	150	288
3:30 PM	0	0	0	0	0	150	0	0	150	0	139	0	139	289
3:45 PM	0	0	1	0	0	116	0	0	116	1	160	0	161	277
Hourly Total	5	6	3	11	0	510	5	0	515	5	600	0	605	1131
4:00 PM	0	2	0	2	0	139	0	0	139	2	153	0	155	296
4:15 PM	0	1	0	1	0	127	0	0	127	0	141	0	141	269
4:30 PM	0	2	0	2	0	121	1	0	122	1	168	0	169	293
4:45 PM	1	3	0	4	0	131	5	0	136	1	152	0	153	293
Hourly Total	1	8	0	9	0	518	6	0	524	4	614	0	618	1151
5:00 PM	0	5	0	5	0	110	3	0	113	1	162	0	163	281
5:15 PM	0	1	0	1	0	114	0	1	114	0	173	0	173	288
5:30 PM	0	0	1	0	0	113	0	0	113	0	126	0	126	239
5:45 PM	0	0	2	0	0	121	0	0	121	0	126	0	126	247
Hourly Total	0	6	3	6	0	458	3	1	461	1	587	0	588	1055
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	1	4	6	5	0	170	4	0	174	3	83	0	86	265
7:15 AM	7	19	0	26	0	137	18	0	155	7	121	0	128	309
7:30 AM	5	22	0	27	0	154	13	0	167	12	126	0	138	332
7:45 AM	0	0	1	0	0	139	0	0	139	0	139	0	139	278
Hourly Total	13	45	7	58	0	600	35	0	635	22	469	0	491	1184
8:00 AM	0	0	1	0	0	135	0	0	135	0	142	0	142	277
8:15 AM	0	3	0	3	0	143	0	0	143	0	103	0	103	249
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	3	1	3	0	278	0	0	278	0	245	0	245	526
1:30 PM	0	0	0	0	0	129	0	0	129	0	118	0	118	247
1:45 PM	0	0	1	0	0	146	0	0	146	0	113	0	113	259
Hourly Total	0	0	1	0	0	275	0	0	275	0	231	0	231	506
2:00 PM	0	0	0	0	0	143	0	0	143	0	126	0	126	269
2:15 PM	0	0	1	0	0	136	4	0	140	0	151	0	151	291
2:30 PM	0	9	0	9	0	145	17	0	162	0	133	0	133	304
2:45 PM	6	21	0	27	0	139	15	0	154	7	139	0	146	327
Hourly Total	6	30	1	36	0	563	36	0	599	7	549	0	556	1191

3:00 PM	3	3	0	6	0	134	4	0	138	1	137	0	138	282
3:15 PM	1	1	0	2	0	133	1	0	134	1	148	0	149	285
3:30 PM	2	1	4	3	0	130	3	0	133	1	153	0	154	290
3:45 PM	0	1	1	1	0	133	0	0	133	0	157	0	157	291
Hourly Total	6	6	5	12	0	530	8	0	538	3	595	0	598	1148
4:00 PM	0	1	2	1	0	126	0	0	126	2	148	0	150	277
4:15 PM	0	2	3	2	1	132	0	0	133	0	170	0	170	305
4:30 PM	0	3	0	3	0	146	2	0	148	4	167	0	171	322
4:45 PM	0	2	0	2	0	136	1	0	137	0	170	0	170	309
Hourly Total	0	8	5	8	1	540	3	0	544	6	655	0	661	1213
5:00 PM	0	2	0	2	0	124	1	0	125	0	174	0	174	301
5:15 PM	0	1	2	1	0	107	1	0	108	0	155	0	155	264
5:30 PM	0	0	0	0	0	118	0	0	118	0	160	0	160	278
5:45 PM	0	0	1	0	0	98	0	0	98	0	132	0	132	230
Hourly Total	0	3	3	3	0	447	2	0	449	0	621	0	621	1073
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	2	3	6	5	0	164	6	0	170	1	76	0	77	252
7:15 AM	4	15	1	19	0	151	13	0	164	5	114	0	119	302
7:30 AM	5	23	0	28	0	124	18	0	142	10	150	0	160	330
7:45 AM	1	1	0	2	0	133	1	0	134	0	130	0	130	266
Hourly Total	12	42	7	54	0	572	38	0	610	16	470	0	486	1150
8:00 AM	4	0	3	4	1	126	1	0	128	0	135	0	135	267
8:15 AM	1	0	2	1	0	139	0	0	139	0	130	0	130	270
Grand Total	66	179	42	245	2	6370	174	1	6546	73	6651	0	6724	13515
Approach %	26.9	73.1	-	-	0.0	97.3	2.7	-	-	1.1	98.9	-	-	-
Total %	0.5	1.3	-	1.8	0.0	47.1	1.3	-	48.4	0.5	49.2	-	49.8	-
Motorcycles	0	0	-	0	0	35	0	-	35	0	39	-	39	74
% Motorcycles	0.0	0.0	-	0.0	0.0	0.5	0.0	-	0.5	0.0	0.6	-	0.6	0.5
Cars	55	156	-	211	2	4686	151	-	4839	59	4991	-	5050	10100
% Cars	83.3	87.2	-	86.1	100.0	73.6	86.8	-	73.9	80.8	75.0	-	75.1	74.7
Light Goods Vehicles	11	23	-	34	0	1478	23	-	1501	14	1467	-	1481	3016
% Light Goods Vehicles	16.7	12.8	-	13.9	0.0	23.2	13.2	-	22.9	19.2	22.1	-	22.0	22.3
Buses	0	0	-	0	0	91	0	-	91	0	86	-	86	177
% Buses	0.0	0.0	-	0.0	0.0	1.4	0.0	-	1.4	0.0	1.3	-	1.3	1.3
Single-Unit Trucks	0	0	-	0	0	63	0	-	63	0	61	-	61	124
% Single-Unit Trucks	0.0	0.0	-	0.0	0.0	1.0	0.0	-	1.0	0.0	0.9	-	0.9	0.9
Articulated Trucks	0	0	-	0	0	12	0	-	12	0	4	-	4	16
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.2	0.0	-	0.2	0.0	0.1	-	0.1	0.1
Bicycles on Road	0	0	-	0	0	5	0	-	5	0	3	-	3	8
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.1	0.0	-	0.1	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	6	-	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	14.3	-	-	-	-	0.0	-	-	-	-	-	-
Pedestrians	-	-	36	-	-	-	-	1	-	-	-	0	-	-
% Pedestrians	-	-	85.7	-	-	-	-	100.0	-	-	-	-	-	-

The Traffic Management Consultant
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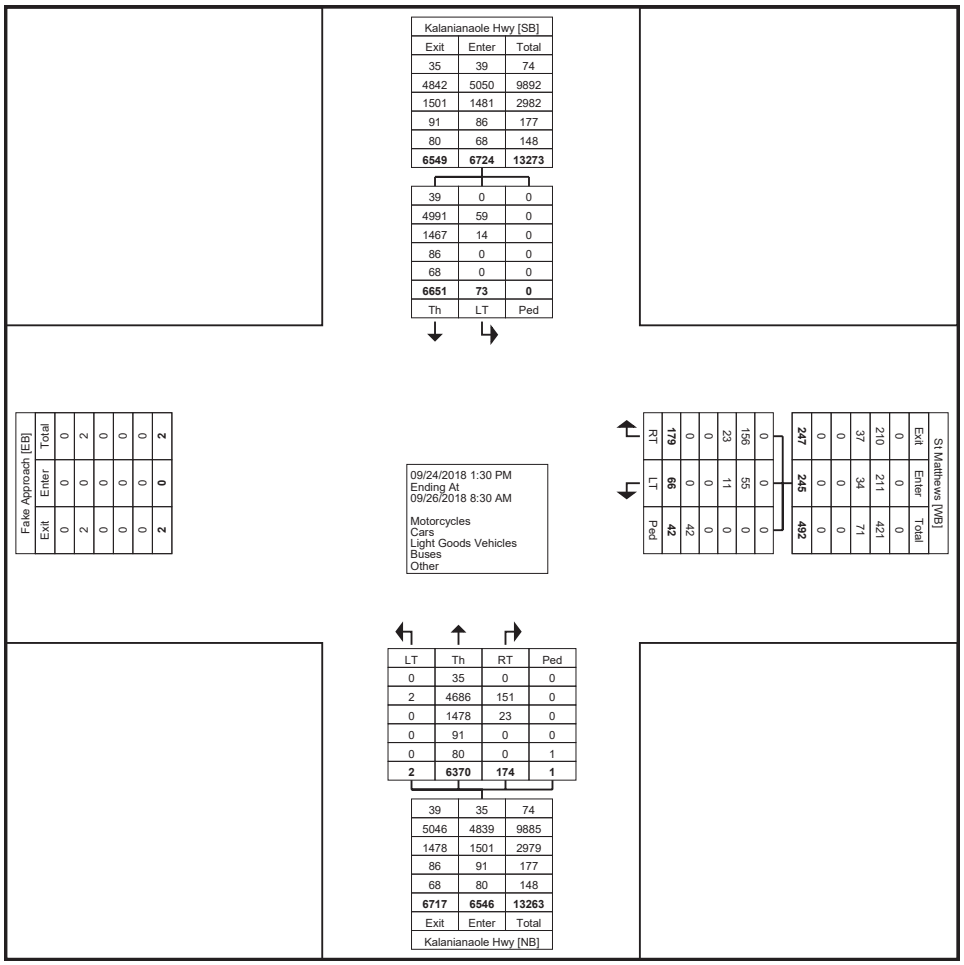
Count Name: St Matthews Dwy Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Data Plot

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Count Name: St Matthews Dwy Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (2:15 PM)

Start Time	St Matthews Westbound				Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound				
	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Int. Total
2:15 PM	2	0	0	2	0	139	4	0	143	0	155	0	155	300
2:30 PM	1	10	0	11	0	154	15	0	169	1	135	0	136	316
2:45 PM	13	12	0	25	0	121	17	0	138	7	125	0	132	295
3:00 PM	4	5	2	9	0	108	5	0	113	4	151	0	155	277
Total	20	27	2	47	0	522	41	0	563	12	566	0	578	1188
Approach %	42.6	57.4	-	-	0.0	92.7	7.3	-	-	2.1	97.9	-	-	-
Total %	1.7	2.3	-	4.0	0.0	43.9	3.5	-	47.4	1.0	47.6	-	48.7	-
PHF	0.385	0.563	-	0.470	0.000	0.847	0.603	-	0.833	0.429	0.913	-	0.932	0.940
Motorcycles	0	0	-	0	0	4	0	-	4	0	8	-	8	12
% Motorcycles	0.0	0.0	-	0.0	-	0.8	0.0	-	0.7	0.0	1.4	-	1.4	1.0
Cars	17	21	-	38	0	404	34	-	438	11	411	-	422	898
% Cars	85.0	77.8	-	80.9	-	77.4	82.9	-	77.8	91.7	72.6	-	73.0	75.6
Light Goods Vehicles	3	6	-	9	0	108	7	-	115	1	129	-	130	254
% Light Goods Vehicles	15.0	22.2	-	19.1	-	20.7	17.1	-	20.4	8.3	22.8	-	22.5	21.4
Buses	0	0	-	0	0	6	0	-	6	0	13	-	13	19
% Buses	0.0	0.0	-	0.0	-	1.1	0.0	-	1.1	0.0	2.3	-	2.2	1.6
Single-Unit Trucks	0	0	-	0	0	0	0	-	0	0	5	-	5	5
% Single-Unit Trucks	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0	0.9	-	0.9	0.4
Articulated Trucks	0	0	-	0	0	0	0	-	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	0	-	0	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	2	-	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-

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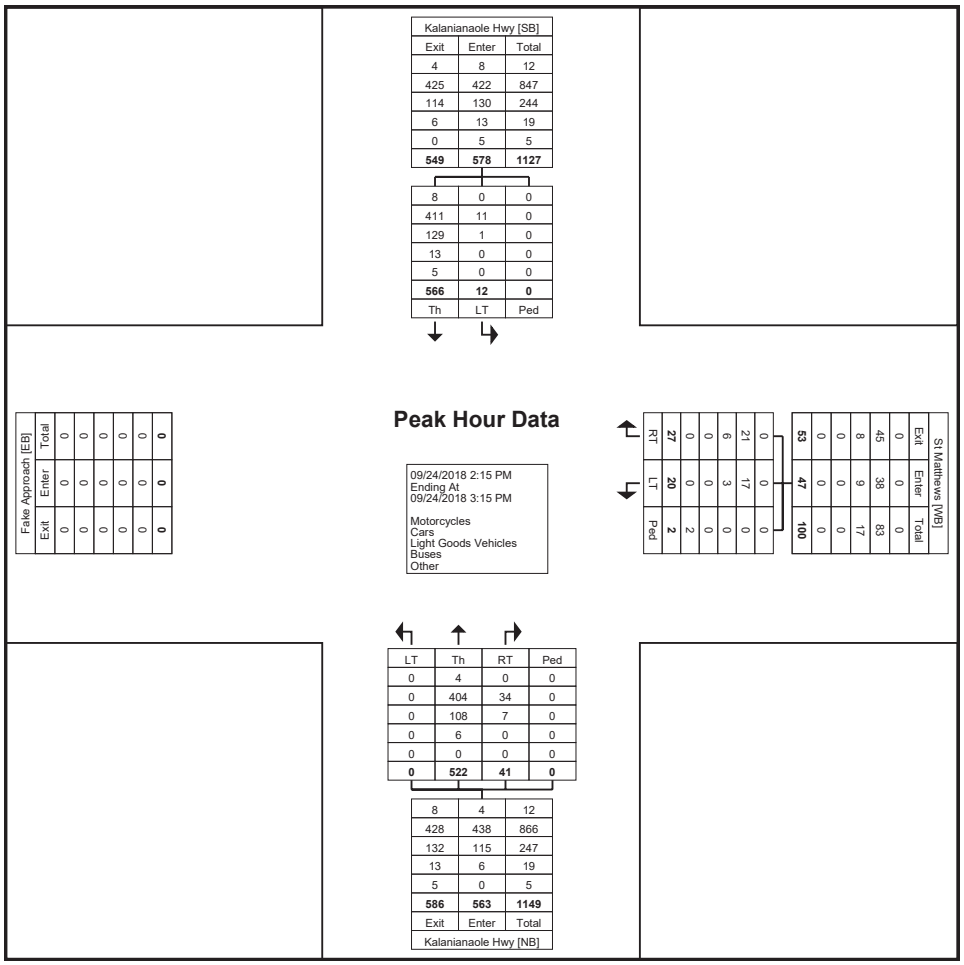

Turning Movement Peak Hour Data Plot (2:15 PM)

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Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: St Matthews Dwy Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	St Matthews Westbound				Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound				
	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Int. Total
7:15 AM	7	19	0	26	0	137	18	0	155	7	121	0	128	309
7:30 AM	5	22	0	27	0	154	13	0	167	12	126	0	138	332
7:45 AM	0	0	1	0	0	139	0	0	139	0	139	0	139	278
8:00 AM	0	0	1	0	0	135	0	0	135	0	142	0	142	277
Total	12	41	2	53	0	565	31	0	596	19	528	0	547	1196
Approach %	22.6	77.4	-	-	0.0	94.8	5.2	-	-	3.5	96.5	-	-	-
Total %	1.0	3.4	-	4.4	0.0	47.2	2.6	-	49.8	1.6	44.1	-	45.7	-
PHF	0.429	0.466	-	0.491	0.000	0.917	0.431	-	0.892	0.396	0.930	-	0.963	0.901
Motorcycles	0	0	-	0	0	0	0	-	0	0	1	-	1	1
% Motorcycles	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0	0.2	-	0.2	0.1
Cars	10	38	-	48	0	425	28	-	453	17	404	-	421	922
% Cars	83.3	92.7	-	90.6	-	75.2	90.3	-	76.0	89.5	76.5	-	77.0	77.1
Light Goods Vehicles	2	3	-	5	0	121	3	-	124	2	106	-	108	237
% Light Goods Vehicles	16.7	7.3	-	9.4	-	21.4	9.7	-	20.8	10.5	20.1	-	19.7	19.8
Buses	0	0	-	0	0	8	0	-	8	0	5	-	5	13
% Buses	0.0	0.0	-	0.0	-	1.4	0.0	-	1.3	0.0	0.9	-	0.9	1.1
Single-Unit Trucks	0	0	-	0	0	7	0	-	7	0	12	-	12	19
% Single-Unit Trucks	0.0	0.0	-	0.0	-	1.2	0.0	-	1.2	0.0	2.3	-	2.2	1.6
Articulated Trucks	0	0	-	0	0	3	0	-	3	0	0	-	0	3
% Articulated Trucks	0.0	0.0	-	0.0	-	0.5	0.0	-	0.5	0.0	0.0	-	0.0	0.3
Bicycles on Road	0	0	-	0	0	1	0	-	1	0	0	-	0	1
% Bicycles on Road	0.0	0.0	-	0.0	-	0.2	0.0	-	0.2	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	2	-	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-

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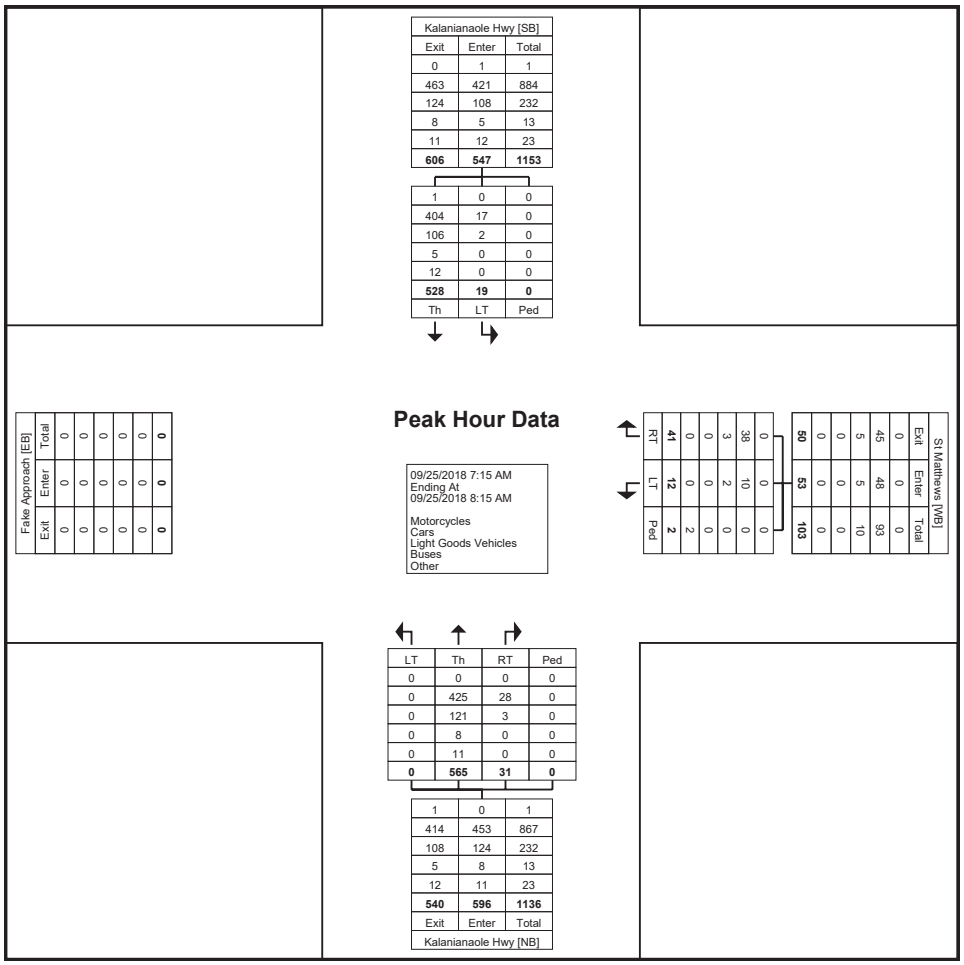

Turning Movement Peak Hour Data Plot (7:15 AM)

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Count Name: St Matthews Dwy Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (4:15 PM)

Start Time	St Matthews Westbound				Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound				
	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Int. Total
4:15 PM	0	2	3	2	1	132	0	0	133	0	170	0	170	305
4:30 PM	0	3	0	3	0	146	2	0	148	4	167	0	171	322
4:45 PM	0	2	0	2	0	136	1	0	137	0	170	0	170	309
5:00 PM	0	2	0	2	0	124	1	0	125	0	174	0	174	301
Total	0	9	3	9	1	538	4	0	543	4	681	0	685	1237
Approach %	0.0	100.0	-	-	0.2	99.1	0.7	-	-	0.6	99.4	-	-	-
Total %	0.0	0.7	-	0.7	0.1	43.5	0.3	-	43.9	0.3	55.1	-	55.4	-
PHF	0.000	0.750	-	0.750	0.250	0.921	0.500	-	0.917	0.250	0.978	-	0.984	0.960
Motorcycles	0	0	-	0	0	3	0	-	3	0	2	-	2	5
% Motorcycles	-	0.0	-	0.0	0.0	0.6	0.0	-	0.6	0.0	0.3	-	0.3	0.4
Cars	0	9	-	9	1	380	4	-	385	3	506	-	509	903
% Cars	-	100.0	-	100.0	100.0	70.6	100.0	-	70.9	75.0	74.3	-	74.3	73.0
Light Goods Vehicles	0	0	-	0	0	142	0	-	142	1	160	-	161	303
% Light Goods Vehicles	-	0.0	-	0.0	0.0	26.4	0.0	-	26.2	25.0	23.5	-	23.5	24.5
Buses	0	0	-	0	0	8	0	-	8	0	7	-	7	15
% Buses	-	0.0	-	0.0	0.0	1.5	0.0	-	1.5	0.0	1.0	-	1.0	1.2
Single-Unit Trucks	0	0	-	0	0	4	0	-	4	0	6	-	6	10
% Single-Unit Trucks	-	0.0	-	0.0	0.0	0.7	0.0	-	0.7	0.0	0.9	-	0.9	0.8
Articulated Trucks	0	0	-	0	0	0	0	-	0	0	0	-	0	0
% Articulated Trucks	-	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	0	-	0	0	1	0	-	1	0	0	-	0	1
% Bicycles on Road	-	0.0	-	0.0	0.0	0.2	0.0	-	0.2	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	3	-	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-

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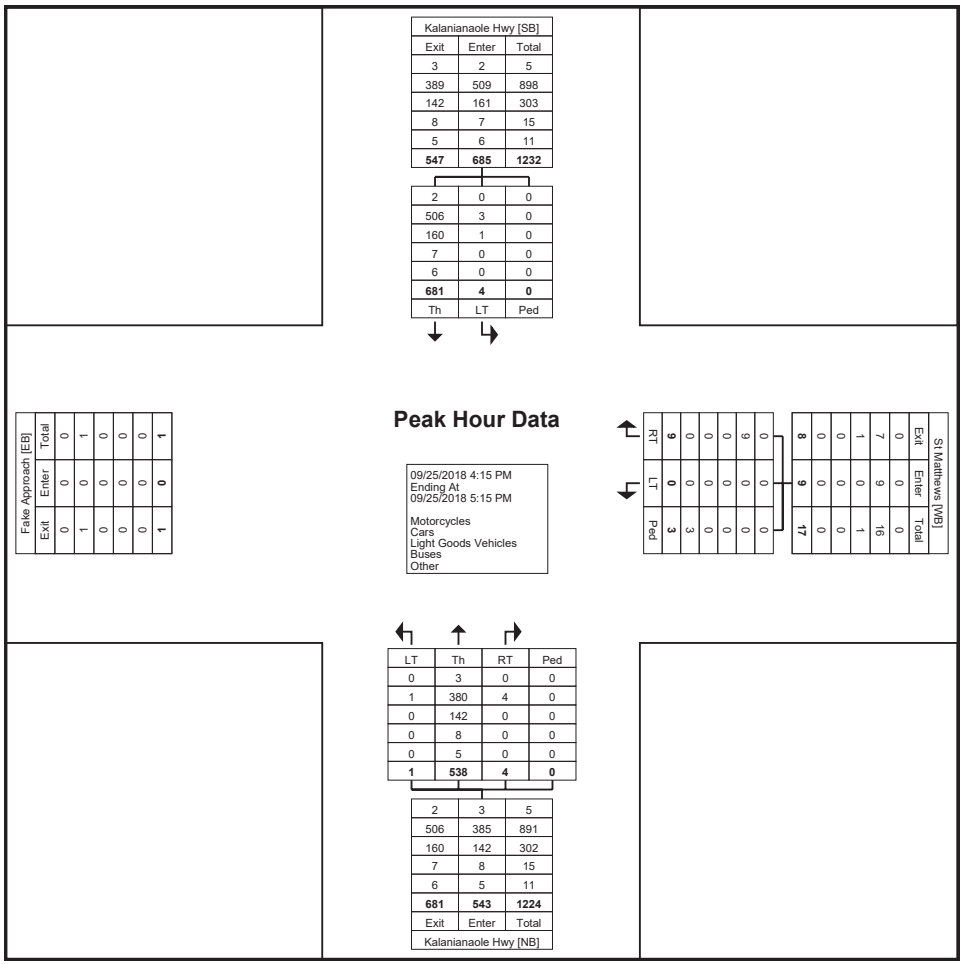
Count Name: St Matthews Dwy Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (4:15 PM)

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808-536-0223 tmchawaii@aol.com

Count Name: St Matthews Dwy Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (2:15 PM)

Start Time	St Matthews Westbound				Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound				
	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Int. Total
2:15 PM	0	0	1	0	0	136	4	0	140	0	151	0	151	291
2:30 PM	0	9	0	9	0	145	17	0	162	0	133	0	133	304
2:45 PM	6	21	0	27	0	139	15	0	154	7	139	0	146	327
3:00 PM	3	3	0	6	0	134	4	0	138	1	137	0	138	282
Total	9	33	1	42	0	554	40	0	594	8	560	0	568	1204
Approach %	21.4	78.6	-	-	0.0	93.3	6.7	-	-	1.4	98.6	-	-	-
Total %	0.7	2.7	-	3.5	0.0	46.0	3.3	-	49.3	0.7	46.5	-	47.2	-
PHF	0.375	0.393	-	0.389	0.000	0.955	0.588	-	0.917	0.286	0.927	-	0.940	0.920
Motorcycles	0	0	-	0	0	6	0	-	6	0	3	-	3	9
% Motorcycles	0.0	0.0	-	0.0	-	1.1	0.0	-	1.0	0.0	0.5	-	0.5	0.7
Cars	7	28	-	35	0	412	33	-	445	7	412	-	419	899
% Cars	77.8	84.8	-	83.3	-	74.4	82.5	-	74.9	87.5	73.6	-	73.8	74.7
Light Goods Vehicles	2	5	-	7	0	115	7	-	122	1	125	-	126	255
% Light Goods Vehicles	22.2	15.2	-	16.7	-	20.8	17.5	-	20.5	12.5	22.3	-	22.2	21.2
Buses	0	0	-	0	0	12	0	-	12	0	13	-	13	25
% Buses	0.0	0.0	-	0.0	-	2.2	0.0	-	2.0	0.0	2.3	-	2.3	2.1
Single-Unit Trucks	0	0	-	0	0	6	0	-	6	0	6	-	6	12
% Single-Unit Trucks	0.0	0.0	-	0.0	-	1.1	0.0	-	1.0	0.0	1.1	-	1.1	1.0
Articulated Trucks	0	0	-	0	0	2	0	-	2	0	1	-	1	3
% Articulated Trucks	0.0	0.0	-	0.0	-	0.4	0.0	-	0.3	0.0	0.2	-	0.2	0.2
Bicycles on Road	0	0	-	0	0	1	0	-	1	0	0	-	0	1
% Bicycles on Road	0.0	0.0	-	0.0	-	0.2	0.0	-	0.2	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	1	-	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-

The Traffic Management Consultant
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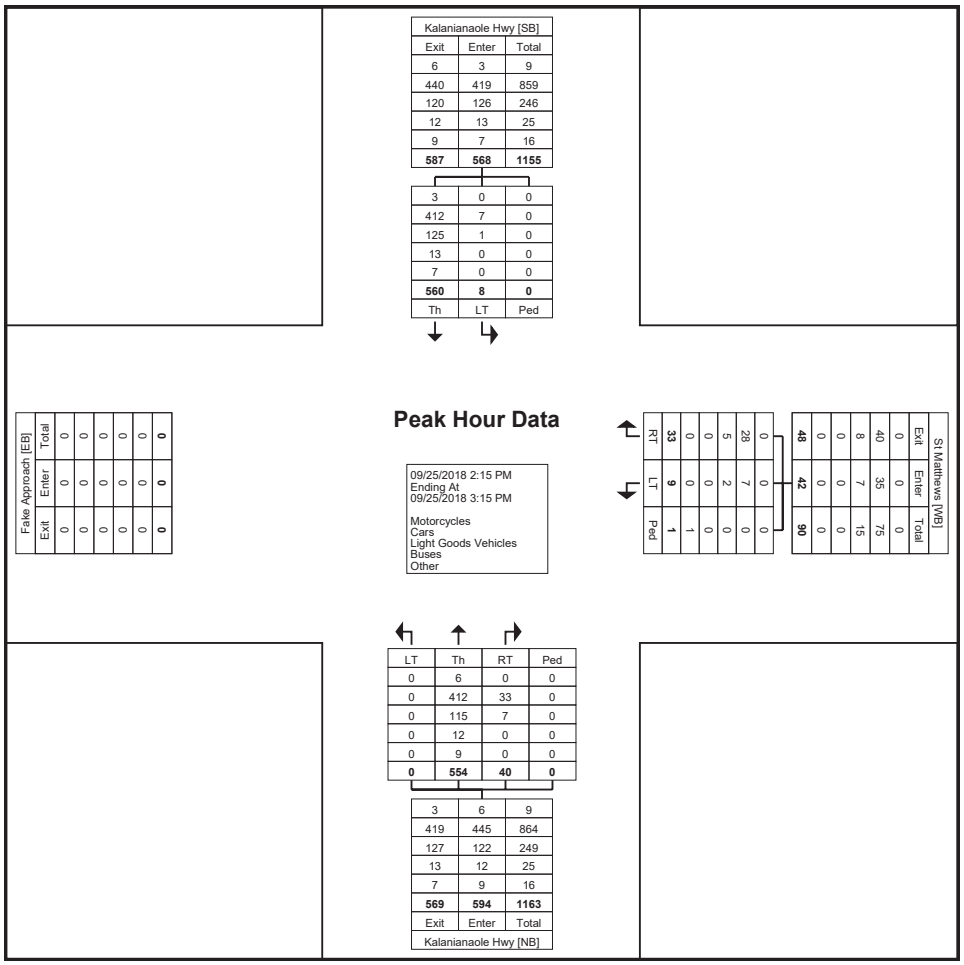
Honolulu, Hawaii, United States 96813
808-536-0223 tmchawaii@aol.com

Count Name: St Matthews Dwy Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018



Turning Movement Peak Hour Data Plot (2:15 PM)

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Count Name: St Matthews Dwy Kalanianaole Highway
Site Code: Malama Honua
Start Date: 09/24/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	St Matthews Westbound				Kalanianaole Hwy Northbound					Kalanianaole Hwy Southbound				
	Left-Turn	Right-Turn	Peds	App. Total	Left-Turn	Thru	Right-Turn	Peds	App. Total	Left-Turn	Thru	Peds	App. Total	Int. Total
7:15 AM	4	15	1	19	0	151	13	0	164	5	114	0	119	302
7:30 AM	5	23	0	28	0	124	18	0	142	10	150	0	160	330
7:45 AM	1	1	0	2	0	133	1	0	134	0	130	0	130	266
8:00 AM	4	0	3	4	1	126	1	0	128	0	135	0	135	267
Total	14	39	4	53	1	534	33	0	568	15	529	0	544	1165
Approach %	26.4	73.6	-	-	0.2	94.0	5.8	-	-	2.8	97.2	-	-	-
Total %	1.2	3.3	-	4.5	0.1	45.8	2.8	-	48.8	1.3	45.4	-	46.7	-
PHF	0.700	0.424	-	0.473	0.250	0.884	0.458	-	0.866	0.375	0.882	-	0.850	0.883
Motorcycles	0	0	-	0	0	0	0	-	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Cars	12	35	-	47	1	395	31	-	427	12	395	-	407	881
% Cars	85.7	89.7	-	88.7	100.0	74.0	93.9	-	75.2	80.0	74.7	-	74.8	75.6
Light Goods Vehicles	2	4	-	6	0	126	2	-	128	3	122	-	125	259
% Light Goods Vehicles	14.3	10.3	-	11.3	0.0	23.6	6.1	-	22.5	20.0	23.1	-	23.0	22.2
Buses	0	0	-	0	0	7	0	-	7	0	5	-	5	12
% Buses	0.0	0.0	-	0.0	0.0	1.3	0.0	-	1.2	0.0	0.9	-	0.9	1.0
Single-Unit Trucks	0	0	-	0	0	5	0	-	5	0	7	-	7	12
% Single-Unit Trucks	0.0	0.0	-	0.0	0.0	0.9	0.0	-	0.9	0.0	1.3	-	1.3	1.0
Articulated Trucks	0	0	-	0	0	1	0	-	1	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.2	0.0	-	0.2	0.0	0.0	-	0.0	0.1
Bicycles on Road	0	0	-	0	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	4	-	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-

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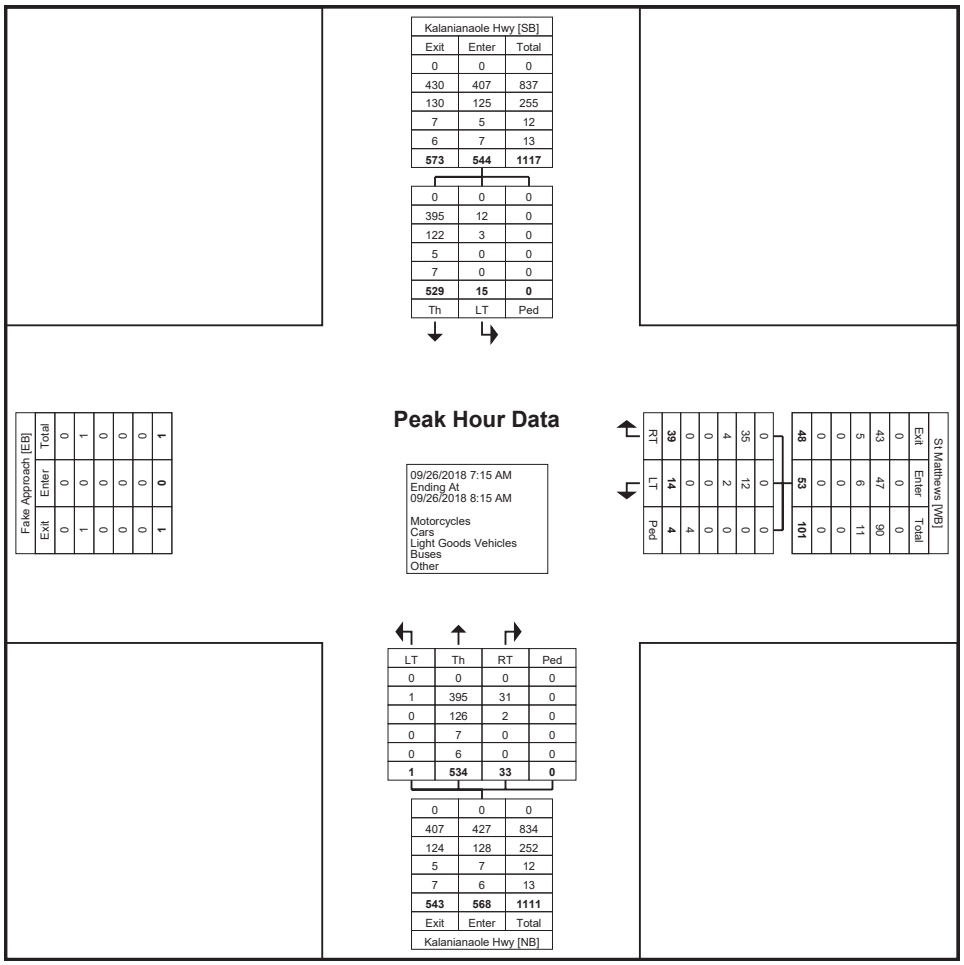


Turning Movement Peak Hour Data Plot (7:15 AM)

TRANSPORTATION ASSESSMENT REPORT

FOR THE PROPOSED

MALAMA HONUA PUBLIC CHARTER SCHOOL RELOCATION AND EXPANSION

WAIMANALO, OAHU, HAWAII

TAX MAP KEY: 4-1-026:PORTION OF 001

APPENDIX B

CAPACITY ANALYSIS WORKSHEETS

EXISTING TRAFFIC CONDITIONS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	630	79	33	675	13	135	31	54	19	19	37
Future Volume (vph)	27	630	79	33	675	13	135	31	54	19	19	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1678	1720	0	1694	1741	0	0	1630	0	0	1605	0
Flt Permitted	0.310			0.278				0.741			0.929	
Satd. Flow (perm)	544	1720	0	491	1741	0	0	1209	0	0	1500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			1			10			48	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	11		22	22		11	17		11	11		17
Confl. Bikes (#/hr)						2			1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	89%	110%	106%	133%	105%	50%	113%	90%	96%	84%	105%	130%
Heavy Vehicles (%)	4%	2%	3%	3%	2%	0%	6%	0%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	5	0	0	8	0	0	0	1	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	777	0	44	716	0	0	233	0	0	84	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		23.0	23.0		23.0	23.0	
Total Split (s)	94.0	94.0		94.0	94.0		31.0	31.0		31.0	31.0	
Total Split (%)	75.2%	75.2%		75.2%	75.2%		24.8%	24.8%		24.8%	24.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	89.0	89.0		89.0	89.0			26.0			26.0	
Actuated g/C Ratio	0.71	0.71		0.71	0.71			0.21			0.21	
v/c Ratio	0.06	0.63		0.13	0.58			0.90			0.24	
Control Delay	5.9	12.1		6.7	11.1			81.9			22.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	5.9	12.1		6.7	11.1			81.9			22.0	
LOS	A	B		A	B			F			C	
Approach Delay		12.0			10.8			81.9			22.0	
Approach LOS		B			B			F			C	
Queue Length 50th (ft)	5	290		10	254			178			24	
Queue Length 95th (ft)	14	407		24	352			#334			70	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	387	1228		349	1239			259			350	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.06	0.63		0.13	0.58			0.90			0.24	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 125			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 20.6		Intersection LOS: C	
Intersection Capacity Utilization 70.1%		ICU Level of Service C	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	99	12	13	169	3	7	1	19	2	1	3
Future Vol, veh/h	6	99	12	13	169	3	7	1	19	2	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	5	0	8	3	0	0	0	11	0	0	0
Mvmt Flow	9	84	18	11	135	2	6	1	30	4	1	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	137	0	0	102	0	0	274	270	93	285	278	136
Stage 1	-	-	-	-	-	-	111	111	-	158	158	-
Stage 2	-	-	-	-	-	-	163	159	-	127	120	-
Critical Hdwy	4.1	-	-	4.18	-	-	7.1	6.5	6.31	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.272	-	-	3.5	4	3.399	3.5	4	3.3
Pot Cap-1 Maneuver	1459	-	-	1453	-	-	683	640	940	671	633	918
Stage 1	-	-	-	-	-	-	899	807	-	849	771	-
Stage 2	-	-	-	-	-	-	844	770	-	882	800	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1459	-	-	1453	-	-	668	630	940	641	624	918
Mov Cap-2 Maneuver	-	-	-	-	-	-	668	630	-	641	624	-
Stage 1	-	-	-	-	-	-	893	801	-	843	765	-
Stage 2	-	-	-	-	-	-	828	764	-	847	794	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.5	9.3	9.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	870	1459	-	-	1453	-	-	793
HCM Lane V/C Ratio	0.043	0.006	-	-	0.007	-	-	0.018
HCM Control Delay (s)	9.3	7.5	0	-	7.5	0	-	9.6
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	3	66	6	3	16	53	558	5	8	534	11
Future Vol, veh/h	17	3	66	6	3	16	53	558	5	8	534	11
Conflicting Peds, #/hr	0	0	4	4	0	0	2	0	6	6	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	8	0	0	0	2	3	0	0	3	0
Mvmt Flow	24	4	92	4	4	32	60	619	12	4	545	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1321	1315	554	1359	1312	631	553	0	0	637	0	0
Stage 1	558	558	-	751	751	-	-	-	-	-	-	-
Stage 2	763	757	-	608	561	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.28	7.1	6.5	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.372	3.5	4	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	135	159	521	127	160	485	1017	-	-	956	-	-
Stage 1	518	515	-	406	421	-	-	-	-	-	-	-
Stage 2	400	419	-	486	513	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	114	143	518	94	144	482	1015	-	-	951	-	-
Mov Cap-2 Maneuver	114	143	-	94	144	-	-	-	-	-	-	-
Stage 1	470	511	-	367	381	-	-	-	-	-	-	-
Stage 2	336	379	-	393	509	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.1	19.3	0.8	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1015	-	-	288	292	951	-	-
HCM Lane V/C Ratio	0.059	-	-	0.416	0.137	0.004	-	-
HCM Control Delay (s)	8.8	0	-	26.1	19.3	8.8	0	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	2	0.5	0	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	41	565	31	19	528
Future Vol, veh/h	12	41	565	31	19	528
Conflicting Peds, #/hr	0	0	0	2	2	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	100	100	100	100	100	100
Heavy Vehicles, %	0	0	3	0	0	3
Mvmt Flow	20	88	616	52	48	502

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1242	644	0	0	670	0
Stage 1	644	-	-	-	-	-
Stage 2	598	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	195	476	-	-	930	-
Stage 1	527	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	181	475	-	-	928	-
Mov Cap-2 Maneuver	181	-	-	-	-	-
Stage 1	526	-	-	-	-	-
Stage 2	513	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	365	928	-
HCM Lane V/C Ratio	-	-	0.296	0.052	-
HCM Control Delay (s)	-	-	19	9.1	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	643	71	35	631	4	144	13	54	19	10	24
Future Volume (vph)	21	643	71	35	631	4	144	13	54	19	10	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	10	10	11	10	10
Storage Length (ft)	75		0	50		0	0		20	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1745	1631	0	1745	1751	0	0	1576	0	0	1612	0
Flt Permitted	0.321			0.286				0.760			0.863	
Satd. Flow (perm)	588	1631	0	520	1751	0	0	1219	0	0	1417	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			1			11			20	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	5		23	23		5	11		4	4		11
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	95%	98%	146%	50%	106%	100%	114%	123%	74%	126%	160%	83%
Heavy Vehicles (%)	0%	3%	7%	0%	1%	0%	6%	0%	4%	0%	0%	4%
Bus Blockages (#/hr)	0	13	1	0	9	0	1	0	1	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	734	0	18	673	0	0	220	0	0	60	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		23.0	23.0		23.0	23.0	
Total Split (s)	65.0	65.0		65.0	65.0		25.0	25.0		25.0	25.0	
Total Split (%)	72.2%	72.2%		72.2%	72.2%		27.8%	27.8%		27.8%	27.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	60.0	60.0		60.0	60.0			20.0			20.0	
Actuated g/C Ratio	0.67	0.67		0.67	0.67			0.22			0.22	
v/c Ratio	0.05	0.67		0.05	0.58			0.79			0.18	
Control Delay	5.6	12.6		5.7	10.6			53.0			22.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	5.6	12.6		5.7	10.6			53.0			22.4	
LOS	A	B		A	B			D			C	
Approach Delay		12.4			10.4			53.0			22.4	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)	3	215		3	182			113			18	
Queue Length 95th (ft)	11	338		10	275			#232			52	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	392	1094		346	1167			279			330	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.05	0.67		0.05	0.58			0.79			0.18	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 17.1		Intersection LOS: B	
Intersection Capacity Utilization 67.2%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	96	6	11	136	17	12	2	26	17	4	44
Future Vol, veh/h	22	96	6	11	136	17	12	2	26	17	4	44
Conflicting Peds, #/hr	3	0	0	0	0	3	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	5	9	0	9	7	0	0	0	8	0	0	2
Mvmt Flow	32	68	4	12	180	16	16	4	36	28	8	60

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	199	0	0	72	0	0	380	357	71	370	351	191
Stage 1	-	-	-	-	-	-	134	134	-	215	215	-
Stage 2	-	-	-	-	-	-	246	223	-	155	136	-
Critical Hdwy	4.15	-	-	4.19	-	-	7.1	6.5	6.28	7.1	6.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.281	-	-	3.5	4	3.372	3.5	4	3.318
Pot Cap-1 Maneuver	1356	-	-	1485	-	-	581	572	975	590	577	851
Stage 1	-	-	-	-	-	-	874	789	-	792	729	-
Stage 2	-	-	-	-	-	-	762	723	-	852	788	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1352	-	-	1485	-	-	521	551	974	549	556	849
Mov Cap-2 Maneuver	-	-	-	-	-	-	521	551	-	549	556	-
Stage 1	-	-	-	-	-	-	852	769	-	770	720	-
Stage 2	-	-	-	-	-	-	694	714	-	795	768	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0.4	10.2	10.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	747	1352	-	-	1485	-	-	705
HCM Lane V/C Ratio	0.075	0.024	-	-	0.008	-	-	0.136
HCM Control Delay (s)	10.2	7.7	0	-	7.4	0	-	10.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.5

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	8	46	4	2	18	40	559	4	12	549	11
Future Vol, veh/h	16	8	46	4	2	18	40	559	4	12	549	11
Conflicting Peds, #/hr	2	0	4	4	0	2	3	0	5	5	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	4	0	0	0	3	4	0	0	3	0
Mvmt Flow	12	16	48	4	4	9	36	559	4	24	582	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1281	1279	595	1310	1283	568	597	0	0	568	0	0
Stage 1	639	639	-	638	638	-	-	-	-	-	-	-
Stage 2	642	640	-	672	645	-	-	-	-	-	-	-
Critical Hdwy	2	2	2	2	2	2	2	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.336	3.5	4	3.3	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	883	829	1009	879	828	1021	1388	-	-	1014	-	-
Stage 1	468	474	-	468	474	-	-	-	-	-	-	-
Stage 2	466	473	-	449	471	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	819	764	1003	772	763	1015	1384	-	-	1010	-	-
Mov Cap-2 Maneuver	819	764	-	772	763	-	-	-	-	-	-	-
Stage 1	449	456	-	448	454	-	-	-	-	-	-	-
Stage 2	440	453	-	396	453	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	9.2	0.5	0.3
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1384	-	-	911	881	1010	-	-
HCM Lane V/C Ratio	0.026	-	-	0.083	0.019	0.024	-	-
HCM Control Delay (s)	7.7	0	-	9.3	9.2	8.7	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	33	554	40	8	560
Future Vol, veh/h	9	33	554	40	8	560
Conflicting Peds, #/hr	0	0	0	1	1	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	100	100	100	100	100	100
Heavy Vehicles, %	0	0	3	0	0	3
Mvmt Flow	24	84	554	60	24	554

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1187	585	0	0	615	0
Stage 1	585	-	-	-	-	-
Stage 2	602	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	210	515	-	-	974	-
Stage 1	561	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	202	515	-	-	973	-
Mov Cap-2 Maneuver	202	-	-	-	-	-
Stage 1	560	-	-	-	-	-
Stage 2	531	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.1	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	383	973	-
HCM Lane V/C Ratio	-	-	0.282	0.025	-
HCM Control Delay (s)	-	-	18.1	8.8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	712	70	37	585	11	130	26	44	21	10	24
Future Volume (vph)	18	712	70	37	585	11	130	26	44	21	10	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1745	1704	0	1745	1755	0	0	1688	0	0	1625	0
Flt Permitted	0.346			0.255				0.788			0.855	
Satd. Flow (perm)	634	1704	0	467	1755	0	0	1353	0	0	1418	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			4			19			24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	3		5	5		3	9		3	3		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	111%	96%	131%	141%	103%	182%	89%	108%	118%	114%	50%	100%
Heavy Vehicles (%)	0%	2%	3%	0%	1%	18%	1%	0%	2%	0%	0%	4%
Bus Blockages (#/hr)	0	8	1	0	6	1	0	0	0	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	776	0	52	623	0	0	196	0	0	53	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		23.0	23.0		23.0	23.0	
Total Split (s)	64.0	64.0		64.0	64.0		26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%		28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	59.0	59.0		59.0	59.0			21.0			21.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.23			0.23	
v/c Ratio	0.05	0.69		0.17	0.54			0.59			0.15	
Control Delay	6.0	13.6		7.7	10.4			36.1			18.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	6.0	13.6		7.7	10.4			36.1			18.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B		A	B			D			B	
Approach Delay		13.4			10.2			36.1			18.8	
Approach LOS		B			B			D			B	
Queue Length 50th (ft)	4	242		10	166			90			13	
Queue Length 95th (ft)	12	374		26	251			163			43	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	415	1122		306	1151			330			349	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.05	0.69		0.17	0.54			0.59			0.15	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 14.9		Intersection LOS: B	
Intersection Capacity Utilization 67.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	21	113	12	26	103	16	14	1	22	14	1	13
Future Vol, veh/h	21	113	12	26	103	16	14	1	22	14	1	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	5	0	4	5	0	0	0	0	0	0	0
Mvmt Flow	28	120	6	24	144	8	16	1	20	16	1	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	152	0	0	126	0	0	388	379	125	388	378	148
Stage 1	-	-	-	-	-	-	179	179	-	196	196	-
Stage 2	-	-	-	-	-	-	209	200	-	192	182	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1441	-	-	1448	-	-	574	556	931	574	557	904
Stage 1	-	-	-	-	-	-	827	755	-	810	742	-
Stage 2	-	-	-	-	-	-	798	739	-	814	753	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1441	-	-	1448	-	-	541	534	929	544	535	904
Mov Cap-2 Maneuver	-	-	-	-	-	-	541	534	-	544	535	-
Stage 1	-	-	-	-	-	-	810	739	-	793	729	-
Stage 2	-	-	-	-	-	-	762	726	-	777	737	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	1	10.4	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	699	1441	-	-	1448	-	-	709
HCM Lane V/C Ratio	0.053	0.019	-	-	0.017	-	-	0.058
HCM Control Delay (s)	10.4	7.5	0	-	7.5	0	-	10.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.1	-	-	0.2

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	4	52	8	3	5	49	533	8	13	662	6
Future Vol, veh/h	7	4	52	8	3	5	49	533	8	13	662	6
Conflicting Peds, #/hr	0	0	1	1	0	0	3	0	9	9	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	40	0	2	0	8	2	9
Mvmt Flow	4	8	72	4	3	4	40	586	4	20	636	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1357	1364	646	1400	1368	597	651	0	0	599	0	0
Stage 1	685	685	-	677	677	-	-	-	-	-	-	-
Stage 2	672	679	-	723	691	-	-	-	-	-	-	-
Critical Hdwy	2	2	2	2	2	2	2	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.66	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	871	819	1010	865	819	942	1381	-	-	949	-	-
Stage 1	441	451	-	446	455	-	-	-	-	-	-	-
Stage 2	449	454	-	421	449	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	814	749	1006	745	749	935	1377	-	-	942	-	-
Mov Cap-2 Maneuver	814	749	-	745	749	-	-	-	-	-	-	-
Stage 1	421	435	-	423	432	-	-	-	-	-	-	-
Stage 2	425	431	-	371	433	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	9.5	0.5	0.3
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1377	-	-	964	806	942	-	-
HCM Lane V/C Ratio	0.029	-	-	0.087	0.014	0.021	-	-
HCM Control Delay (s)	7.7	0	-	9.1	9.5	8.9	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	9	538	4	4	681
Future Vol, veh/h	1	9	538	4	4	681
Conflicting Peds, #/hr	0	0	0	3	3	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	100	100	100	100	100	100
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	1	12	586	8	12	667

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1284	593	0	0	597	0
Stage 1	593	-	-	-	-	-
Stage 2	691	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	184	509	-	-	989	-
Stage 1	556	-	-	-	-	-
Stage 2	501	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	180	508	-	-	986	-
Mov Cap-2 Maneuver	180	-	-	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	491	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	445	986	-
HCM Lane V/C Ratio	-	-	0.029	0.012	-
HCM Control Delay (s)	-	-	13.3	8.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

TRANSPORTATION ASSESSMENT REPORT

FOR THE PROPOSED

MALAMA HONUA PUBLIC CHARTER SCHOOL RELOCATION AND EXPANSION

WAIMANALO, OAHU, HAWAII
TAX MAP KEY: 4-1-026:PORTION OF 001

APPENDIX C

CAPACITY ANALYSIS WORKSHEETS

2025 PEAK HOUR TRAFFIC WITHOUT PROJECT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	652	82	34	699	13	140	32	56	20	20	38
Future Volume (vph)	28	652	82	34	699	13	140	32	56	20	20	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1678	1720	0	1694	1741	0	0	1630	0	0	1606	0
Flt Permitted	0.297			0.264				0.736			0.925	
Satd. Flow (perm)	521	1720	0	471	1741	0	0	1202	0	0	1496	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			1			11			47	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	11		22	22		11	17		11	11		17
Confl. Bikes (#/hr)						2			1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	89%	110%	106%	133%	105%	50%	113%	90%	96%	84%	105%	130%
Heavy Vehicles (%)	4%	2%	3%	3%	2%	0%	6%	0%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	5	0	0	8	0	0	0	1	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	804	0	45	741	0	0	241	0	0	87	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		23.0	23.0		23.0	23.0	
Total Split (s)	94.0	94.0		94.0	94.0		31.0	31.0		31.0	31.0	
Total Split (%)	75.2%	75.2%		75.2%	75.2%		24.8%	24.8%		24.8%	24.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	89.0	89.0		89.0	89.0			26.0			26.0	
Actuated g/C Ratio	0.71	0.71		0.71	0.71			0.21			0.21	
v/c Ratio	0.07	0.65		0.13	0.60			0.93			0.25	
Control Delay	6.0	12.7		6.9	11.5			88.3			23.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	6.0	12.7		6.9	11.5			88.3			23.0	
LOS	A	B		A	B			F			C	
Approach Delay		12.5			11.2			88.3			23.0	
Approach LOS		B			B			F			C	
Queue Length 50th (ft)	6	309		10	269			185			27	
Queue Length 95th (ft)	15	435		24	373			#349			73	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	370	1228		335	1239			258			348	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.07	0.65		0.13	0.60			0.93			0.25	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 125			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 21.9		Intersection LOS: C	
Intersection Capacity Utilization 72.1%		ICU Level of Service C	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	102	12	13	175	3	7	1	20	2	1	3
Future Vol, veh/h	6	102	12	13	175	3	7	1	20	2	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	5	0	8	3	0	0	0	11	0	0	0
Mvmt Flow	9	87	18	11	140	2	6	1	32	4	1	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	142	0	0	105	0	0	282	278	96	294	286	141
Stage 1	-	-	-	-	-	-	114	114	-	163	163	-
Stage 2	-	-	-	-	-	-	168	164	-	131	123	-
Critical Hdwy	4.1	-	-	4.18	-	-	7.1	6.5	6.31	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.272	-	-	3.5	4	3.399	3.5	4	3.3
Pot Cap-1 Maneuver	1453	-	-	1450	-	-	674	633	936	662	627	912
Stage 1	-	-	-	-	-	-	896	805	-	844	767	-
Stage 2	-	-	-	-	-	-	839	766	-	877	798	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1453	-	-	1450	-	-	659	624	936	632	618	912
Mov Cap-2 Maneuver	-	-	-	-	-	-	659	624	-	632	618	-
Stage 1	-	-	-	-	-	-	890	799	-	838	761	-
Stage 2	-	-	-	-	-	-	823	760	-	840	792	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.5	9.3	9.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	867	1453	-	-	1450	-	-	786
HCM Lane V/C Ratio	0.045	0.006	-	-	0.007	-	-	0.018
HCM Control Delay (s)	9.3	7.5	0	-	7.5	0	-	9.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	3	70	6	3	17	55	578	5	8	553	11
Future Vol, veh/h	18	3	70	6	3	17	55	578	5	8	553	11
Conflicting Peds, #/hr	0	0	4	4	0	0	2	0	6	6	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	8	0	0	0	2	3	0	0	3	0
Mvmt Flow	25	4	97	4	4	34	62	642	12	4	564	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1368	1361	573	1408	1358	654	572	0	0	660	0	0
Stage 1	577	577	-	778	778	-	-	-	-	-	-	-
Stage 2	791	784	-	630	580	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.28	7.1	6.5	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.372	3.5	4	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	125	150	508	118	150	470	1001	-	-	938	-	-
Stage 1	506	505	-	392	410	-	-	-	-	-	-	-
Stage 2	386	407	-	473	503	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	104	134	505	85	134	468	999	-	-	933	-	-
Mov Cap-2 Maneuver	104	134	-	85	134	-	-	-	-	-	-	-
Stage 1	455	501	-	352	368	-	-	-	-	-	-	-
Stage 2	319	365	-	375	499	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.3	20.1	0.8	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	999	-	-	272	281	933	-	-
HCM Lane V/C Ratio	0.062	-	-	0.466	0.15	0.004	-	-
HCM Control Delay (s)	8.8	0	-	29.3	20.1	8.9	0	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	2.3	0.5	0	-	-

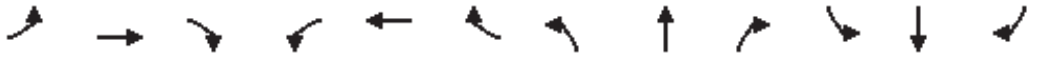
Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	42	585	32	20	546
Future Vol, veh/h	12	42	585	32	20	546
Conflicting Peds, #/hr	0	0	0	2	2	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	100	100	100	100	100	100
Heavy Vehicles, %	0	0	3	0	0	3
Mvmt Flow	20	90	638	54	51	519

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1288	667	0	0	694	0
Stage 1	667	-	-	-	-	-
Stage 2	621	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	183	462	-	-	911	-
Stage 1	514	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	168	461	-	-	909	-
Mov Cap-2 Maneuver	168	-	-	-	-	-
Stage 1	513	-	-	-	-	-
Stage 2	497	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	350	909	-
HCM Lane V/C Ratio	-	-	0.315	0.056	-
HCM Control Delay (s)	-	-	20	9.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0.2	-

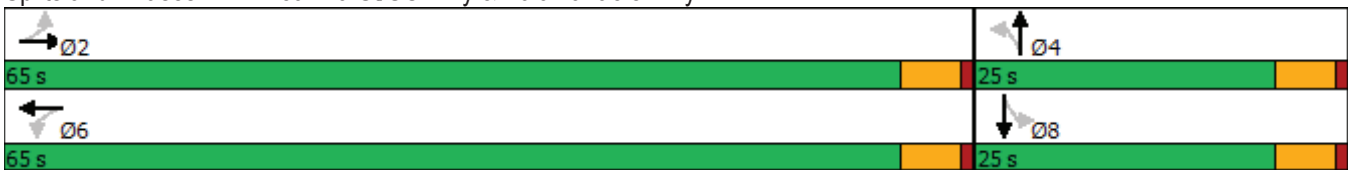


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	666	73	36	653	4	149	13	56	20	10	25
Future Volume (vph)	22	666	73	36	653	4	149	13	56	20	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1745	1632	0	1745	1751	0	0	1634	0	0	1667	0
Flt Permitted	0.308			0.271				0.767			0.860	
Satd. Flow (perm)	564	1632	0	493	1751	0	0	1275	0	0	1460	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			1			11			21	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	5		23	23		5	11		4	4		11
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	95%	98%	146%	50%	106%	100%	114%	123%	74%	126%	160%	83%
Heavy Vehicles (%)	0%	3%	7%	0%	1%	0%	6%	0%	4%	0%	0%	4%
Bus Blockages (#/hr)	0	13	1	0	9	0	1	0	1	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	760	0	18	696	0	0	227	0	0	62	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		23.0	23.0		23.0	23.0	
Total Split (s)	65.0	65.0		65.0	65.0		25.0	25.0		25.0	25.0	
Total Split (%)	72.2%	72.2%		72.2%	72.2%		27.8%	27.8%		27.8%	27.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	60.0	60.0		60.0	60.0			20.0			20.0	
Actuated g/C Ratio	0.67	0.67		0.67	0.67			0.22			0.22	
v/c Ratio	0.06	0.69		0.05	0.60			0.78			0.18	
Control Delay	5.7	13.3		5.7	10.9			51.5			22.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.7	13.3		5.7	10.9			51.5			22.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B		A	B			D			C	
Approach Delay		13.1			10.8			51.5			22.2	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)	4	230		3	192			116			19	
Queue Length 95th (ft)	12	362		11	290			#235			52	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	376	1094		328	1167			291			340	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.06	0.69		0.05	0.60			0.78			0.18	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 17.4		Intersection LOS: B	
Intersection Capacity Utilization 69.0%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy



Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	99	6	11	141	18	12	2	27	18	4	46
Future Vol, veh/h	23	99	6	11	141	18	12	2	27	18	4	46
Conflicting Peds, #/hr	3	0	0	0	0	3	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	5	9	0	9	7	0	0	0	8	0	0	2
Mvmt Flow	33	70	4	12	186	17	16	4	37	30	8	63

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	206	0	0	74	0	0	392	368	73	382	362	198
Stage 1	-	-	-	-	-	-	138	138	-	222	222	-
Stage 2	-	-	-	-	-	-	254	230	-	160	140	-
Critical Hdwy	4.15	-	-	4.19	-	-	7.1	6.5	6.28	7.1	6.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.281	-	-	3.5	4	3.372	3.5	4	3.318
Pot Cap-1 Maneuver	1348	-	-	1482	-	-	571	564	972	580	569	843
Stage 1	-	-	-	-	-	-	870	786	-	785	723	-
Stage 2	-	-	-	-	-	-	755	718	-	847	785	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1344	-	-	1482	-	-	509	543	971	538	547	841
Mov Cap-2 Maneuver	-	-	-	-	-	-	509	543	-	538	547	-
Stage 1	-	-	-	-	-	-	847	766	-	762	714	-
Stage 2	-	-	-	-	-	-	685	709	-	788	765	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0.4	10.3	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	742	1344	-	-	1482	-	-	695
HCM Lane V/C Ratio	0.077	0.025	-	-	0.008	-	-	0.144
HCM Control Delay (s)	10.3	7.7	0	-	7.4	0	-	11.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.5

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	8	48	4	2	19	41	579	4	12	568	11
Future Vol, veh/h	17	8	48	4	2	19	41	579	4	12	568	11
Conflicting Peds, #/hr	2	0	4	4	0	2	3	0	5	5	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	4	0	0	0	3	4	0	0	3	0
Mvmt Flow	13	16	50	4	4	10	37	579	4	24	602	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1323	1321	615	1353	1325	588	617	0	0	588	0	0
Stage 1	659	659	-	660	660	-	-	-	-	-	-	-
Stage 2	664	662	-	693	665	-	-	-	-	-	-	-
Critical Hdwy	2	2	2	2	2	2	2	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.336	3.5	4	3.3	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	877	824	1006	872	824	1018	1380	-	-	997	-	-
Stage 1	456	464	-	455	463	-	-	-	-	-	-	-
Stage 2	453	462	-	437	461	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	812	756	1000	762	756	1012	1376	-	-	993	-	-
Mov Cap-2 Maneuver	812	756	-	762	756	-	-	-	-	-	-	-
Stage 1	436	445	-	435	443	-	-	-	-	-	-	-
Stage 2	426	442	-	384	443	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	9.2	0.5	0.3
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1376	-	-	906	878	993	-	-
HCM Lane V/C Ratio	0.027	-	-	0.087	0.02	0.024	-	-
HCM Control Delay (s)	7.7	0	-	9.4	9.2	8.7	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	34	573	41	8	580
Future Vol, veh/h	9	34	573	41	8	580
Conflicting Peds, #/hr	0	0	0	1	1	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	100	100	100	100	100	100
Heavy Vehicles, %	0	0	3	0	0	3
Mvmt Flow	24	87	573	62	24	574

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1227	605	0	0	636	0
Stage 1	605	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	199	501	-	-	957	-
Stage 1	549	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	191	501	-	-	956	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	548	-	-	-	-	-
Stage 2	519	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.8	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	371	956	-
HCM Lane V/C Ratio	-	-	0.298	0.025	-
HCM Control Delay (s)	-	-	18.8	8.9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	737	72	38	605	11	135	27	46	22	10	25
Future Volume (vph)	19	737	72	38	605	11	135	27	46	22	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1745	1704	0	1745	1755	0	0	1688	0	0	1625	0
Flt Permitted	0.333			0.240				0.787			0.851	
Satd. Flow (perm)	611	1704	0	440	1755	0	0	1351	0	0	1411	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			4			19			25	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	3		5	5		3	9		3	3		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	111%	96%	131%	141%	103%	182%	89%	108%	118%	114%	50%	100%
Heavy Vehicles (%)	0%	2%	3%	0%	1%	18%	1%	0%	2%	0%	0%	4%
Bus Blockages (#/hr)	0	8	1	0	6	1	0	0	0	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	802	0	54	643	0	0	203	0	0	55	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		23.0	23.0		23.0	23.0	
Total Split (s)	64.0	64.0		64.0	64.0		26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%		28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	59.0	59.0		59.0	59.0			21.0			21.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.23			0.23	
v/c Ratio	0.05	0.71		0.19	0.56			0.62			0.16	
Control Delay	6.0	14.4		8.1	10.7			37.2			18.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	6.0	14.4		8.1	10.7			37.2			18.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B		A	B			D			B	
Approach Delay		14.2			10.5			37.2			18.8	
Approach LOS		B			B			D			B	
Queue Length 50th (ft)	4	257		11	175			94			13	
Queue Length 95th (ft)	12	400		28	264			169			44	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	400	1122		288	1151			329			348	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.05	0.71		0.19	0.56			0.62			0.16	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 15.5		Intersection LOS: B	
Intersection Capacity Utilization 69.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	117	12	27	107	17	14	1	23	14	1	13
Future Vol, veh/h	22	117	12	27	107	17	14	1	23	14	1	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	5	0	4	5	0	0	0	0	0	0	0
Mvmt Flow	29	124	6	25	150	9	16	1	21	16	1	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	159	0	0	130	0	0	402	394	129	403	393	155
Stage 1	-	-	-	-	-	-	185	185	-	205	205	-
Stage 2	-	-	-	-	-	-	217	209	-	198	188	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1433	-	-	1443	-	-	562	546	926	562	546	896
Stage 1	-	-	-	-	-	-	821	751	-	802	736	-
Stage 2	-	-	-	-	-	-	790	733	-	808	748	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1433	-	-	1443	-	-	529	524	924	531	524	896
Mov Cap-2 Maneuver	-	-	-	-	-	-	529	524	-	531	524	-
Stage 1	-	-	-	-	-	-	803	734	-	784	722	-
Stage 2	-	-	-	-	-	-	753	719	-	770	732	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	1	10.5	10.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	692	1433	-	-	1443	-	-	697
HCM Lane V/C Ratio	0.055	0.02	-	-	0.017	-	-	0.059
HCM Control Delay (s)	10.5	7.6	0	-	7.5	0	-	10.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.1	-	-	0.2

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	4	54	8	3	5	51	552	8	13	685	6
Future Vol, veh/h	7	4	54	8	3	5	51	552	8	13	685	6
Conflicting Peds, #/hr	0	0	1	1	0	0	3	0	9	9	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	40	0	2	0	8	2	0
Mvmt Flow	4	8	75	4	3	4	42	607	4	20	658	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1404	1411	668	1449	1415	618	673	0	0	620	0	0
Stage 1	707	707	-	702	702	-	-	-	-	-	-	-
Stage 2	697	704	-	747	713	-	-	-	-	-	-	-
Critical Hdwy	2	2	2	2	2	2	2	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.66	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	864	814	1007	857	814	940	1373	-	-	932	-	-
Stage 1	429	441	-	432	443	-	-	-	-	-	-	-
Stage 2	435	443	-	408	438	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	804	742	1003	733	742	933	1369	-	-	925	-	-
Mov Cap-2 Maneuver	804	742	-	733	742	-	-	-	-	-	-	-
Stage 1	408	424	-	409	419	-	-	-	-	-	-	-
Stage 2	410	419	-	357	421	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	9.6	0.5	0.3
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1369	-	-	961	798	925	-	-
HCM Lane V/C Ratio	0.031	-	-	0.09	0.014	0.022	-	-
HCM Control Delay (s)	7.7	0	-	9.1	9.6	9	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	9	557	4	4	705
Future Vol, veh/h	1	9	557	4	4	705
Conflicting Peds, #/hr	0	0	0	3	3	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	100	100	100	100	100	100
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	1	12	607	8	12	691

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1329	614	0	0	618	0
Stage 1	614	-	-	-	-	-
Stage 2	715	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	173	496	-	-	972	-
Stage 1	544	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	169	495	-	-	969	-
Mov Cap-2 Maneuver	169	-	-	-	-	-
Stage 1	542	-	-	-	-	-
Stage 2	478	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	431	969	-
HCM Lane V/C Ratio	-	-	0.03	0.012	-
HCM Control Delay (s)	-	-	13.6	8.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

TRANSPORTATION ASSESSMENT REPORT

FOR THE PROPOSED

MALAMA HONUA PUBLIC CHARTER SCHOOL RELOCATION AND EXPANSION

WAIMANALO, OAHU, HAWAII
TAX MAP KEY: 4-1-026:PORTION OF 001

APPENDIX D

CAPACITY ANALYSIS WORKSHEETS

2025 PEAK HOUR TRAFFIC WITH PROJECT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	635	136	44	657	13	185	32	66	20	20	38
Future Volume (vph)	28	635	136	44	657	13	185	32	66	20	20	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1678	1694	0	1694	1739	0	0	1629	0	0	1606	0
Flt Permitted	0.320			0.244				0.725			0.928	
Satd. Flow (perm)	561	1694	0	435	1739	0	0	1183	0	0	1506	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			1			10			47	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	11		22	22		11	17		11	11		17
Confl. Bikes (#/hr)						2			1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	89%	110%	106%	133%	105%	50%	113%	90%	96%	84%	105%	130%
Heavy Vehicles (%)	4%	2%	3%	3%	2%	0%	6%	0%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	5	0	0	8	0	0	0	1	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	843	0	59	697	0	0	301	0	0	87	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		23.0	23.0		23.0	23.0	
Total Split (s)	94.0	94.0		94.0	94.0		31.0	31.0		31.0	31.0	
Total Split (%)	75.2%	75.2%		75.2%	75.2%		24.8%	24.8%		24.8%	24.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	89.0	89.0		89.0	89.0			26.0			26.0	
Actuated g/C Ratio	0.71	0.71		0.71	0.71			0.21			0.21	
v/c Ratio	0.06	0.70		0.19	0.56			1.19			0.25	
Control Delay	5.9	13.8		7.8	10.8			159.4			23.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	5.9	13.8		7.8	10.8			159.4			23.0	
LOS	A	B		A	B			F			C	
Approach Delay		13.6			10.6			159.4			23.0	
Approach LOS		B			B			F			C	
Queue Length 50th (ft)	5	339		14	242			~287			27	
Queue Length 95th (ft)	15	483		32	336			#472			73	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	399	1212		309	1238			253			350	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.06	0.70		0.19	0.56			1.19			0.25	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 125			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.19			
Intersection Signal Delay: 34.7		Intersection LOS: C	
Intersection Capacity Utilization 80.8%		ICU Level of Service D	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	86	106	57	175	3	92	1	43	2	1	3
Future Vol, veh/h	6	86	106	57	175	3	92	1	43	2	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	5	0	8	3	0	0	0	11	0	0	0
Mvmt Flow	9	73	159	46	140	2	81	1	68	4	1	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	142	0	0	232	0	0	409	405	153	438	483	141
Stage 1	-	-	-	-	-	-	171	171	-	233	233	-
Stage 2	-	-	-	-	-	-	238	234	-	205	250	-
Critical Hdwy	4.1	-	-	4.18	-	-	7.1	6.5	6.31	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.272	-	-	3.5	4	3.399	3.5	4	3.3
Pot Cap-1 Maneuver	1453	-	-	1301	-	-	556	538	870	532	486	912
Stage 1	-	-	-	-	-	-	836	761	-	775	716	-
Stage 2	-	-	-	-	-	-	770	715	-	802	704	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1453	-	-	1301	-	-	531	514	870	473	464	912
Mov Cap-2 Maneuver	-	-	-	-	-	-	531	514	-	473	464	-
Stage 1	-	-	-	-	-	-	830	756	-	770	689	-
Stage 2	-	-	-	-	-	-	732	688	-	733	699	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1.9	12.3	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	645	1453	-	-	1301	-	-	684
HCM Lane V/C Ratio	0.232	0.006	-	-	0.035	-	-	0.02
HCM Control Delay (s)	12.3	7.5	0	-	7.9	0	-	10.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.9	0	-	-	0.1	-	-	0.1

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	3	91	6	3	17	95	562	5	8	541	15
Future Vol, veh/h	4	3	91	6	3	17	95	562	5	8	541	15
Conflicting Peds, #/hr	0	0	4	4	0	0	2	0	6	6	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	8	0	0	0	2	3	0	0	3	0
Mvmt Flow	6	4	126	4	4	34	107	624	12	4	552	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1429	1422	562	1483	1420	636	562	0	0	642	0	0
Stage 1	566	566	-	850	850	-	-	-	-	-	-	-
Stage 2	863	856	-	633	570	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.28	7.1	6.5	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.372	3.5	4	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	114	137	515	104	138	481	1009	-	-	952	-	-
Stage 1	513	511	-	358	380	-	-	-	-	-	-	-
Stage 2	352	377	-	471	509	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	89	113	512	66	114	478	1007	-	-	947	-	-
Mov Cap-2 Maneuver	89	113	-	66	114	-	-	-	-	-	-	-
Stage 1	428	507	-	297	316	-	-	-	-	-	-	-
Stage 2	270	313	-	349	505	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.9	22.2	1.3	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	394	251	947	-	-
HCM Lane V/C Ratio	0.107	-	-	0.345	0.167	0.004	-	-
HCM Control Delay (s)	9	0	-	18.9	22.2	8.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	1.5	0.6	0	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	587	0	0	550
Future Vol, veh/h	0	0	587	0	0	550
Conflicting Peds, #/hr	0	0	0	2	2	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	100	100	100	100	100	100
Heavy Vehicles, %	0	0	3	0	0	3
Mvmt Flow	0	0	640	0	0	523

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1165	642	0	0	642	0
Stage 1	642	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	217	478	-	-	952	-
Stage 1	528	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	217	477	-	-	950	-
Mov Cap-2 Maneuver	217	-	-	-	-	-
Stage 1	527	-	-	-	-	-
Stage 2	599	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

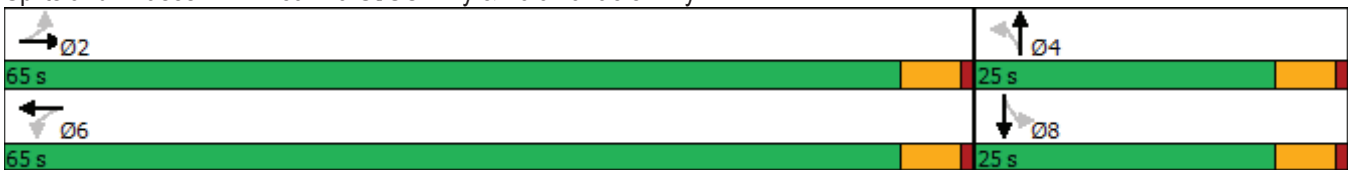
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	950	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	658	104	41	639	4	188	13	63	20	10	25
Future Volume (vph)	22	658	104	41	639	4	188	13	63	20	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1745	1610	0	1745	1751	0	0	1633	0	0	1667	0
Flt Permitted	0.316			0.250				0.763			0.863	
Satd. Flow (perm)	579	1610	0	455	1751	0	0	1268	0	0	1465	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			1			11			21	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	5		23	23		5	11		4	4		11
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	95%	98%	146%	50%	106%	100%	114%	123%	74%	126%	160%	83%
Heavy Vehicles (%)	0%	3%	7%	0%	1%	0%	6%	0%	4%	0%	0%	4%
Bus Blockages (#/hr)	0	13	1	0	9	0	1	0	1	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	797	0	21	681	0	0	277	0	0	62	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		23.0	23.0		23.0	23.0	
Total Split (s)	65.0	65.0		65.0	65.0		25.0	25.0		25.0	25.0	
Total Split (%)	72.2%	72.2%		72.2%	72.2%		27.8%	27.8%		27.8%	27.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	60.0	60.0		60.0	60.0			20.0			20.0	
Actuated g/C Ratio	0.67	0.67		0.67	0.67			0.22			0.22	
v/c Ratio	0.05	0.74		0.07	0.58			0.96			0.18	
Control Delay	5.7	14.6		6.0	10.7			78.2			22.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.7	14.6		6.0	10.7			78.2			22.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B		A	B			E			C	
Approach Delay		14.4			10.5			78.2			22.2	
Approach LOS		B			B			E			C	
Queue Length 50th (ft)	4	252		4	185			151			19	
Queue Length 95th (ft)	12	406		12	280			#308			52	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	386	1082		303	1167			290			341	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.05	0.74		0.07	0.58			0.96			0.18	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 22.7		Intersection LOS: C	
Intersection Capacity Utilization 74.2%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy



Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	82	58	39	141	18	77	2	62	18	4	46
Future Vol, veh/h	23	82	58	39	141	18	77	2	62	18	4	46
Conflicting Peds, #/hr	3	0	0	0	0	3	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	5	9	0	9	7	0	0	0	8	0	0	2
Mvmt Flow	33	58	39	43	186	17	102	4	86	30	8	63

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	206	0	0	97	0	0	460	436	79	474	447	198
Stage 1	-	-	-	-	-	-	144	144	-	284	284	-
Stage 2	-	-	-	-	-	-	316	292	-	190	163	-
Critical Hdwy	4.15	-	-	4.19	-	-	7.1	6.5	6.28	7.1	6.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.281	-	-	3.5	4	3.372	3.5	4	3.318
Pot Cap-1 Maneuver	1348	-	-	1454	-	-	515	517	965	504	509	843
Stage 1	-	-	-	-	-	-	864	782	-	727	680	-
Stage 2	-	-	-	-	-	-	699	675	-	816	767	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1344	-	-	1454	-	-	450	485	964	434	478	841
Mov Cap-2 Maneuver	-	-	-	-	-	-	450	485	-	434	478	-
Stage 1	-	-	-	-	-	-	842	762	-	706	656	-
Stage 2	-	-	-	-	-	-	618	651	-	720	747	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	1.3	14	11.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	591	1344	-	-	1454	-	-	628
HCM Lane V/C Ratio	0.325	0.025	-	-	0.029	-	-	0.16
HCM Control Delay (s)	14	7.7	0	-	7.5	0	-	11.8
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.4	0.1	-	-	0.1	-	-	0.6

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	8	79	4	2	19	66	555	4	12	559	14
Future Vol, veh/h	5	8	79	4	2	19	66	555	4	12	559	14
Conflicting Peds, #/hr	2	0	4	4	0	2	3	0	5	5	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	4	0	0	0	3	4	0	0	3	0
Mvmt Flow	4	16	82	4	4	10	59	555	4	24	593	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1336	1334	608	1382	1339	564	611	0	0	564	0	0
Stage 1	652	652	-	680	680	-	-	-	-	-	-	-
Stage 2	684	682	-	702	659	-	-	-	-	-	-	-
Critical Hdwy	2	2	2	2	2	2	2	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.336	3.5	4	3.3	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	875	823	1007	868	822	1021	1382	-	-	1018	-	-
Stage 1	460	467	-	444	454	-	-	-	-	-	-	-
Stage 2	442	453	-	432	464	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	796	739	1001	720	738	1015	1378	-	-	1014	-	-
Mov Cap-2 Maneuver	796	739	-	720	738	-	-	-	-	-	-	-
Stage 1	431	449	-	415	424	-	-	-	-	-	-	-
Stage 2	406	423	-	367	446	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	9.3	0.7	0.3
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1378	-	-	940	861	1014	-	-
HCM Lane V/C Ratio	0.043	-	-	0.108	0.02	0.024	-	-
HCM Control Delay (s)	7.7	0	-	9.3	9.3	8.6	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	577	0	0	583
Future Vol, veh/h	0	0	577	0	0	583
Conflicting Peds, #/hr	0	0	0	1	1	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	100	100	100	100	100	100
Heavy Vehicles, %	0	0	3	0	0	3
Mvmt Flow	0	0	577	0	0	577

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1155	578	0	0	578	0
Stage 1	578	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	220	519	-	-	1006	-
Stage 1	565	-	-	-	-	-
Stage 2	566	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	220	519	-	-	1005	-
Mov Cap-2 Maneuver	220	-	-	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	566	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

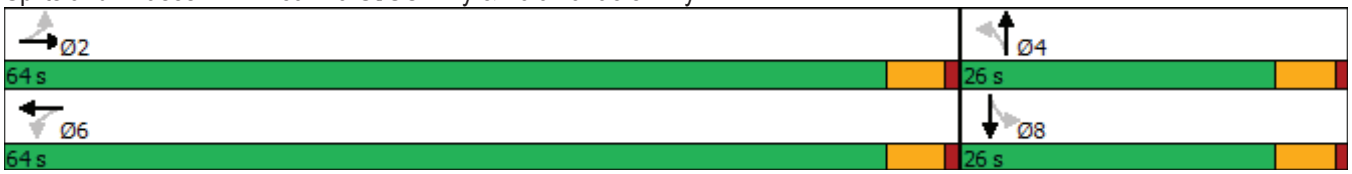
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1005	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	734	82	40	602	11	149	27	48	22	10	25
Future Volume (vph)	19	734	82	40	602	11	149	27	48	22	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1745	1699	0	1745	1755	0	0	1690	0	0	1625	0
Flt Permitted	0.335			0.235				0.782			0.845	
Satd. Flow (perm)	614	1699	0	431	1755	0	0	1344	0	0	1401	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			4			18			25	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	3		5	5		3	9		3	3		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	111%	96%	131%	141%	103%	182%	89%	108%	118%	114%	50%	100%
Heavy Vehicles (%)	0%	2%	3%	0%	1%	18%	1%	0%	2%	0%	0%	4%
Bus Blockages (#/hr)	0	8	1	0	6	1	0	0	0	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	812	0	56	640	0	0	219	0	0	55	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		23.0	23.0		23.0	23.0	
Total Split (s)	64.0	64.0		64.0	64.0		26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%		28.9%	28.9%		28.9%	28.9%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	59.0	59.0		59.0	59.0			21.0			21.0	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.23			0.23	
v/c Ratio	0.05	0.73		0.20	0.56			0.67			0.16	
Control Delay	6.0	14.7		8.3	10.6			40.2			18.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	6.0	14.7		8.3	10.6			40.2			18.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B		A	B			D			B	
Approach Delay		14.5			10.4			40.2			18.9	
Approach LOS		B			B			D			B	
Queue Length 50th (ft)	4	263		11	174			104			13	
Queue Length 95th (ft)	12	410		29	262			#198			44	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	402	1119		282	1151			327			346	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.05	0.73		0.20	0.56			0.67			0.16	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 16.2		Intersection LOS: B	
Intersection Capacity Utilization 73.0%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy



Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	117	28	36	107	17	37	1	35	14	1	13
Future Vol, veh/h	22	117	28	36	107	17	37	1	35	14	1	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	5	0	4	5	0	0	0	0	0	0	0
Mvmt Flow	29	124	14	33	150	9	42	1	32	16	1	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	159	0	0	138	0	0	422	414	133	429	417	155
Stage 1	-	-	-	-	-	-	189	189	-	221	221	-
Stage 2	-	-	-	-	-	-	233	225	-	208	196	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1433	-	-	1433	-	-	546	532	922	540	530	896
Stage 1	-	-	-	-	-	-	817	748	-	786	724	-
Stage 2	-	-	-	-	-	-	775	721	-	799	742	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1433	-	-	1433	-	-	512	508	920	501	506	896
Mov Cap-2 Maneuver	-	-	-	-	-	-	512	508	-	501	506	-
Stage 1	-	-	-	-	-	-	799	732	-	769	706	-
Stage 2	-	-	-	-	-	-	734	703	-	752	726	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	1.3	11.5	10.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	631	1433	-	-	1433	-	-	676
HCM Lane V/C Ratio	0.119	0.02	-	-	0.023	-	-	0.061
HCM Control Delay (s)	11.5	7.6	0	-	7.6	0	-	10.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	0.2

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	4	64	8	3	5	58	548	8	13	685	8
Future Vol, veh/h	9	4	64	8	3	5	58	548	8	13	685	8
Conflicting Peds, #/hr	0	0	1	1	0	0	3	0	9	9	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	40	0	2	0	8	2	9
Mvmt Flow	5	8	88	4	3	4	48	603	4	20	658	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1414	1421	670	1465	1427	614	677	0	0	616	0	0
Stage 1	709	709	-	710	710	-	-	-	-	-	-	-
Stage 2	705	712	-	755	717	-	-	-	-	-	-	-
Critical Hdwy	2	2	2	2	2	2	2	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.66	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	863	813	1006	855	812	940	1372	-	-	935	-	-
Stage 1	428	440	-	428	440	-	-	-	-	-	-	-
Stage 2	430	439	-	404	437	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	798	735	1002	716	734	933	1368	-	-	928	-	-
Mov Cap-2 Maneuver	798	735	-	716	734	-	-	-	-	-	-	-
Stage 1	404	423	-	402	413	-	-	-	-	-	-	-
Stage 2	403	412	-	348	420	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	9.6	0.6	0.3
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1368	-	-	962	788	928	-	-
HCM Lane V/C Ratio	0.035	-	-	0.105	0.014	0.022	-	-
HCM Control Delay (s)	7.7	0	-	9.2	9.6	9	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	559	0	0	707
Future Vol, veh/h	0	0	559	0	0	707
Conflicting Peds, #/hr	0	0	0	3	3	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	100	100	100	100	100	100
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	0	0	604	0	0	721

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1328	607	0	0	607	0
Stage 1	607	-	-	-	-	-
Stage 2	721	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	173	500	-	-	981	-
Stage 1	548	-	-	-	-	-
Stage 2	485	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	172	499	-	-	978	-
Mov Cap-2 Maneuver	172	-	-	-	-	-
Stage 1	546	-	-	-	-	-
Stage 2	485	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	978	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

TRANSPORTATION ASSESSMENT REPORT

FOR THE PROPOSED

MALAMA HONUA PUBLIC CHARTER SCHOOL RELOCATION AND EXPANSION

WAIMANALO, OAHU, HAWAII
TAX MAP KEY: 4-1-026:PORTION OF 001

APPENDIX E

CAPACITY ANALYSIS WORKSHEETS

2025 PEAK HOUR TRAFFIC WITH PROJECT

WITH IMPROVEMENTS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	635	136	44	657	13	185	32	66	20	20	38
Future Volume (vph)	28	635	136	44	657	13	185	32	66	20	20	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1678	1697	0	1694	1739	0	0	1631	0	0	1549	0
Flt Permitted	0.237			0.139				0.966			0.990	
Satd. Flow (perm)	417	1697	0	248	1739	0	0	1584	0	0	1542	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			1			12			49	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	11		22	22		11	17		11	11		17
Confl. Bikes (#/hr)						2			1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	89%	110%	106%	133%	105%	50%	113%	90%	96%	84%	105%	130%
Heavy Vehicles (%)	4%	2%	3%	3%	2%	0%	6%	0%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	5	0	0	8	0	0	0	1	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	843	0	59	697	0	0	301	0	0	87	0
Turn Type	Perm	NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			6		4	4		8	8	
Permitted Phases	2			6								
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		23.0	23.0		12.0	12.0	
Total Split (s)	61.0	61.0		61.0	61.0		27.0	27.0		12.0	12.0	
Total Split (%)	61.0%	61.0%		61.0%	61.0%		27.0%	27.0%		12.0%	12.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	56.0	56.0		56.0	56.0			22.0			7.0	
Actuated g/C Ratio	0.56	0.56		0.56	0.56			0.22			0.07	
v/c Ratio	0.11	0.88		0.43	0.72			0.82			0.56	
Control Delay	11.8	31.4		24.7	21.3			54.8			37.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	11.8	31.4		24.7	21.3			54.8			37.8	
LOS	B	C		C	C			D			D	
Approach Delay		30.9			21.6			54.8			37.8	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	7	432		20	306			177			24	
Queue Length 95th (ft)	21	#714		63	450			#316			#81	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	233	957		138	974			368			154	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.11	0.88		0.43	0.72			0.82			0.56	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 31.3 Intersection LOS: C
Intersection Capacity Utilization 80.8% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	658	104	41	639	4	188	13	63	20	10	25
Future Volume (vph)	22	658	104	41	639	4	188	13	63	20	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	10	10	10
Storage Length (ft)	75		0	50		0	0		20	0		20
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1745	1610	0	1745	1751	0	0	1633	0	0	1586	0
Flt Permitted	0.241			0.159				0.963			0.980	
Satd. Flow (perm)	442	1610	0	292	1751	0	0	1603	0	0	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			1			10			21	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	5		23	23		5	11		4	4		11
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	95%	98%	146%	50%	106%	100%	114%	123%	74%	126%	160%	83%
Heavy Vehicles (%)	0%	3%	7%	0%	1%	0%	6%	0%	4%	0%	0%	4%
Bus Blockages (#/hr)	0	13	1	0	9	0	1	0	1	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	797	0	21	681	0	0	277	0	0	62	0
Turn Type	Perm	NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			6		4	4		8	8	
Permitted Phases	2			6								
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		12.0	12.0		12.0	12.0	
Total Split (s)	54.0	54.0		54.0	54.0		24.0	24.0		12.0	12.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		26.7%	26.7%		13.3%	13.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	49.0	49.0		49.0	49.0			19.0			7.0	
Actuated g/C Ratio	0.54	0.54		0.54	0.54			0.21			0.08	
v/c Ratio	0.09	0.90		0.13	0.71			0.79			0.44	
Control Delay	11.0	33.3		12.7	20.6			49.9			38.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	11.0	33.3		12.7	20.6			49.9			38.9	
LOS	B	C		B	C			D			D	
Approach Delay		32.7			20.3			49.9			38.9	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	5	372		6	271			145			23	
Queue Length 95th (ft)	18	#641		19	408			#270			63	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	240	886		158	953			352			142	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.09	0.90		0.13	0.71			0.79			0.44	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 30.8		Intersection LOS: C	
Intersection Capacity Utilization 74.2%		ICU Level of Service D	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	734	82	40	602	11	149	27	48	22	10	25
Future Volume (vph)	19	734	82	40	602	11	149	27	48	22	10	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	50		0	0		20	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1745	1699	0	1745	1755	0	0	1689	0	0	1594	0
Flt Permitted	0.296			0.185				0.971			0.978	
Satd. Flow (perm)	543	1699	0	340	1755	0	0	1666	0	0	1590	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			3			16			25	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			484			185	
Travel Time (s)		11.4			11.4			11.0			4.2	
Confl. Peds. (#/hr)	3		5	5		3	9		3	3		9
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	111%	96%	131%	141%	103%	182%	89%	108%	118%	114%	50%	100%
Heavy Vehicles (%)	0%	2%	3%	0%	1%	18%	1%	0%	2%	0%	0%	4%
Bus Blockages (#/hr)	0	8	1	0	6	1	0	0	0	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	812	0	56	640	0	0	219	0	0	55	0
Turn Type	Perm	NA		Perm	NA		Split	NA		Split	NA	
Protected Phases		2			6		4	4		8	8	
Permitted Phases	2			6								
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		23.0	23.0		12.0	12.0	
Total Split (s)	64.0	64.0		64.0	64.0		24.0	24.0		12.0	12.0	
Total Split (%)	64.0%	64.0%		64.0%	64.0%		24.0%	24.0%		12.0%	12.0%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Act Effct Green (s)	59.0	59.0		59.0	59.0			19.0			7.0	
Actuated g/C Ratio	0.59	0.59		0.59	0.59			0.19			0.07	
v/c Ratio	0.07	0.81		0.28	0.62			0.66			0.41	
Control Delay	9.5	23.7		14.7	16.4			45.2			37.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	9.5	23.7		14.7	16.4			45.2			37.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	C		B	B			D			D	
Approach Delay		23.3			16.3			45.2			37.8	
Approach LOS		C			B			D			D	
Queue Length 50th (ft)	5	372		16	244			121			19	
Queue Length 95th (ft)	16	560		43	357			202			58	
Internal Link Dist (ft)		420			420			404			105	
Turn Bay Length (ft)	75			50								
Base Capacity (vph)	320	1007		200	1036			333			134	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.07	0.81		0.28	0.62			0.66			0.41	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 23.7		Intersection LOS: C	
Intersection Capacity Utilization 73.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Poalima St/SC Dwy & Kalanianaole Hwy